

**ODESA NATIONAL MEDICAL UNIVERSITY
DEPARTMENT OF PHILOSOPHY, BIOETHICS AND
FOREIGN LANGUAGES**

**ENGLISH
FOR FIRST YEAR
DENTSATRY STUDENTS**

ODESA – 2023

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DENTISTRY - AS A BRANCH OF MEDICINE
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Exercise 1. Key words:

verb	noun	adjective
concern	abnormalities	cleft
decay	application	maxillofacial
Extract	apnoea	vital
estimate	check-up	
involve	decay	
manage	denture	
	drill	
	filling	
	gum	
	jaw	
	majority	
	straightening	

Exercise 2 a). Form nouns and adjectives with a help of suffixes.**Model:** to examine – examination

an abdomen – abdominal

-tion: to restore, to extract, to prevent, to inflame, to examine, to apply, to estimate, to connect.

-al: medicine, periodont, surgery, profession, nature, psychology, dentistry, face.

b) Make word-combinations with the words given above:

Model: to examine – examination

an abdomen – abdominal abdominal examination

Exercise 3. Read the following text.

DENTISTRY

Dentistry is the branch of medicine concerned with diagnosing, preventing, and treating diseases and abnormalities of the teeth and gums. Tooth decay and gum diseases are a health problem made worse by the food we eat.

It is estimated that in the United States alone, 29 million people have no teeth of their own. One person in 3 over the age of 35 needs dentures (false teeth), while a lot of adults over 40 have some teeth missing because of gum disease. Until the middle of the 19th century, most dental operations were performed by barbers. Today the dentist, like the doctor, is a highly-qualified person whose work is vital to the health of the community.

In 1840, dentistry focused on extracting decayed teeth. Today, dentists use modern methods for prevention, diagnosis, and treatment. They implant teeth, pinpoint oral cancers, use 3-D imaging to reshape a jaw, and can treat some dental decay medically, without a drill. They've also discovered much more about the intimate connection between oral health and overall health.

The majority of dental treatments are carried out to prevent or treat the two most common oral diseases which are dental caries (tooth decay) that involves mostly tooth filling and periodontal disease (gum disease or pyorrhoea). Common treatments involve the restoration of teeth, extraction or surgical removal of teeth and root canal treatment.

Dentistry also includes the following fields:

1. Endodontics performs root canal treatment and treatment of the dental pulp

2. Paediatric dentistry focuses on treatment of children oral problems and tooth development and eruption
 3. Periodontics involves treatment and prevention of diseases of the gums, supporting the teeth
 4. Orthodontics involves straightening the crooked teeth and modifying oral-relating facial problems
 5. Oral and maxillofacial surgery includes facial surgery, extractions and implants. They can do everything from treating facial traumas to fixing cleft lips, cleft palates, snoring disorders, and sleep apnoea. They can diagnose and treat patients with head, neck and oral cancer.
 6. Prosthodontics is the branch of dentistry that restores crowns, implants, dentures, bridges and veneers.
 7. Oral and maxillofacial radiology involves application of X-rays, MRI and CT to manage diseases of teeth and facial bones
- Dentists also carry out prevention of oral diseases through proper hygiene and regular, twice yearly, check-ups for professional cleaning and examination.

Exercise 4. Answer the questions.

1. What branch of medicine is called dentistry?
2. What does most of dental treatment consist of?
3. What does periodontal treatment involve?
4. What does the prevention of oral disease consist of?
5. What does orthodontics deal with?
6. What is the aim of prosthodontics?
7. What is maxillofacial surgery connected with?
8. What do endodontists treat?
9. What devices does oral and maxillofacial radiology involve?

Exercise 5. Match the sentence halves.

Endodontist	performs and interprets diagnostic imaging used for examining the craniofacial, dental and adjacent structures such as magnetic resonance imaging, ultrasound, panoramic radiography, cephalometric imaging, intra-oral imaging (e.g. bitewing, peri-apical and occlusal radiographs)
Oral and maxillofacial surgeon	specializes in dental procedures such as porcelain veneers, crowns, dental implants, bridge repair, dentures, and reconstructive dentistry.
Oral and maxillofacial radiologist	is an expert in the diagnosing, preventing and treating dental and facial irregularities, or “malocclusion”
Prosthodontist	Specializes in diagnosis, prevention, and treatment of diseases and injuries of the dental pulp, periapical tissue. They focus on diagnosing tooth pain and root canal treatment
Orthodontist	is a dental specialist who besides prevention, diagnosis, and treatment of diseases affecting the gums, performs minor surgery, like gum grafts and pocket reduction procedures, to resolve severe gum disease and restore the appearance of your smile.
Periodontist	performs surgeries on the face, mouth and jaw. They can even perform cosmetic surgeries, such as face-lifts.

Exercise 6 a). Form nouns from the verbs given below

Prevent, decay, extract, treat, manage, diagnose, remove, apply

b) insert the nouns from the verbs given above instead of gaps

1. Pain _____ includes pain-relieving medicines also known as analgesics.

2. Tooth _____ is performed only in case when the tooth is severely damaged and can't be restored.
3. Dental caries, also known as tooth _____, is the breakdown of teeth due to acids made by bacteria.
4. Regular dental check-up provides _____ of dental caries.
5. Malocclusion _____ includes such dental appliances as braces and retainers to straighten the crooked teeth.
6. It's important to define the etiology and pathogenesis of the disease before making a _____.
7. _____ of local anaesthetics is important before performing root canal treatment.
8. Pulp _____ is a procedure used to clean out the cavity in the tooth root and fill it with a protective substance to prevent further decay.

Exercise 7. Find synonyms to the following words in the text.

Field of medicine, remove teeth, tooth decay, to estimate, perform, regular inspection, gingiva, removal, artificial teeth, treat diseases.

Exercise 8. Memorize suffixes pertaining to specialists and specialties

suffix	meaning	example	definition
-logy	Study of	physiology	Study of organism functions
-ist	Specialist in a field of study	dentist	A specialist in study and treatment of the oral cavity and teeth
-ian -ician	Specialist in a field of study	physician	Practitioner of medicine
-iatry -ics	Field of study	Psychiatry orthodontics	A study and treatment of mental diseases A study and treatment of malocclusion
-iatrist	Specialist in a field of study	podiatrist	Specialist in study and treatment of the foot

Exercise 9. Refer the patient to the right specialist:

1. A child who has a sweet tooth but does not want to brush his teeth - _____
2. A motorcyclist with a broken jaw - _____
3. An actress with one tooth missing. She needs a replacement. - _____
4. A man with calculus deposit - _____
5. A woman with necrotic dental pulp and throbbing pain. - _____
6. A man with all upper teeth missing - _____
7. A child with serious overcrowding. - ___
8. A woman with impacted wisdom tooth - _____
9. A man with exposed roots and loose teeth - _____
10. A man with chipped and stained teeth - _____

Exercise 10. Fill in the blanks with appropriate verb forms.

1. Dental students (to receive) their education in specialized dental schools.
2. In Ukraine a training course for dental students (to last) five academic years.
3. In ancient times people (to believe) that a worm in the teeth (to cause) tooth decay.
4. Entry to a dentistry department (to depend) on the results of the External Independent Testing.
5. Short courses (to offer) to dentists to keep them informed of the new developments in dentistry.
6. Dentistry (to consider) well-paid and secure employment in Great Britain.
7. Study of basic medical and dental subjects (to interconnect) closely with clinical dentistry.
8. Medical students (to study) Anatomy, biochemistry and physiology.

Exercise 11. Make questions to the underlined words.

1. The goals of medical universities are to train clinically competent general practitioners.

2. Until the middle of the 19th century, barbers performed most dental operations.
3. The professor will deliver a lecture in Anatomy next Monday.
4. The students should learn the importance and the role of the dentist.
5. The patient has had an acute toothache since Monday.
6. Before drilling the tooth, the dentist will anesthetize it.
7. As the patient felt very badly, he called in an ambulance.
8. Despite all the performed procedures, the doctor couldn't save the tooth.

Exercise 12. Where can you find these patients? Match the patients with the correct wards departments.

a. A lady who has just given a birth	1. Intensive Care Unit
b. a boy who has broken his leg	2. Orthopaedic
c. old lady who is suffering from pneumonia complications.	3. Paediatric Ward
d. a patient who will have his appendix removed	4. Maternity
e. a lady who is suffering from women's disease	5. Casualty and Emergency Department
f. a man who will be operated on for an eye cataract	6. Surgical Ward
g. Patient injured in a traffic accident with a severe blood loss	7. Geriatric Ward
h. a boy with measles	8. Ophthalmic Ward
i. a man with a burnt arm	9. Gynaecological Ward

Exercise 13. Choose the correct variant:

1. Dentistry with diagnosing, preventing, and treating oral diseases.
A) is dealed B) deal C) will deal D) deals E) dealed
2. People should have regular dental check-ups no less than

- A) once a year B) twice a year C) three times a year D) once a month
E) every day

3. is the area of dentistry that focuses on manufacture and use of dentures.

- A) surgery B) orthodontics C) prosthodontics D) dental therapy E) physiology

4. Until the middle of the 19th century, most dental operations were performed by

- A) hairdressers B) priests C) doctors of general medicine D) dentists
E) barbers.

5. Tooth decay and gum diseases by the kinds of food we eat.

- A) worsens B) are worsened C) worsen D) worsened E) will worsen

6. Root canal treatment is employed when the infection has already reached the

- A) root B) crown C) pulp D) neck of the tooth E) cementum

7. is performed when conservative treatment is ineffective.

- A) scaling B) filling C) extraction of a tooth D) restoration E) prosthesis

8. Dental surgery is concerned the extraction of teeth.

- A) by B) with C) of D) within E) to

Exercise 14. Speak about the science “dentistry” using the prompts.

1. Dentistry is the branch of medicine concerned with
2. The dentist is a specialist, who
3. The most common teeth problems are
4. Common dental treatments are
5. Prevention of oral diseases is carried out with the help of

Self-check

I. Answer the following questions:

1. What branch of medicine is called dentistry?
2. What does orthodontics deal with?
3. What does periodontal treatment involve?
4. What is the aim of prosthodontics?

5. What is maxillofacial surgery connected with?
6. What do endodontists treat?
7. What devices does oral and maxillofacial radiology involve?

II. Describe the terms:

Dentistry, Endodontics, Periodontics, Orthodontics, Oral and maxillofacial surgery

Oral and maxillofacial radiology, Prosthodontics

CELL. TISSUE

Exercise 1. Key words:

nouns	verbs	adjectives/adverbs
cavity	aggregation	columnar
division	allow	cuboidal
epithelium	carry out	fibrous
fiber	digest	hereditary
fiber	embed	jelly-like
filament	exchange	loose
Flagella	line	moisture
glia	lose	neural
<u>lamina</u>	provide	permeable
layer	support	rigid
loss	Surround	self-replicating
passageway		squamous
refinement		striated
stratum		urogenital
tissue		visceral

Exercise 2. Pronounce correctly. Translate without dictionary.

Cytoplasm ['saɪtə(ʊ)plazm], cytoskeleton [saɪtə(ʊ)'skɛlɪt(ə)n], endoplasmic reticulum ['ɪndəplæzmɪk rɪ'tɪkjʊləm], Golgi apparatus ['gɔldʒi ,apə'reɪtəs], lysosome ['laɪsəsəʊm], peroxisome [pɛz'rɒksɪ'səʊm], mitochondrion [ˌmaɪtə(ʊ)'kɒndrɪən], nucleus ['nju:kliəs], plasma membrane ['plazmə 'mɛmbreɪn], ribosome ['rɪbə(ʊ)səʊm], prokaryote [prəʊ'kærɪəʊt], eukaryote [ju:'kærɪəʊt], multicellular [mʌltɪ'seljʊlə(r)], deoxyribonucleic acid [dɪˌɒksɪrɪbəʊnju:'kleɪk 'æsɪd], Archaea [ɑ:r'ki:ə]

Exercise 3. A) Make the adjectives from the nouns below by adding the suffix -al.

Structure, biology, function, nutrition, bacteria, ribosome, environment, clostridium, virus, nature, mitochondrion, fungus, centre, profession, option, season, chromosome.

B) Make the adjectives from the nouns below by adding the suffix -ic.

Cytoplasm, eukaryote, prokaryote, history, anatomy, endoplasm, cycle, rhythm, basis.

Exercise 4. Remember the Plural forms of the following key terms of the lesson.

Write the Plurals of the words given below and translate them.

<i>Singular</i>	<i>Plural</i>	<i>Singular</i>	<i>Plural</i>
bacterium	bacteria	nucleus	nuclei
flagellum	flagella	apparatus	apparatus <i>or</i> apparatuses
reticulum	reticula	mitochondrion	mitochondria
fungus	fungi	archaeon	archaea
pilus	pili	synthesis	syntheses

Bacillus, spirillum, coccus, clostridium, ganglion, criterion, diagnosis, focus, medium, analysis.

Exercise 5. Use the words from the box to complete the sentences. You can use some of the words more than once.

divide division divided dividing divisional

1. Cell **1)** ... is the process by which parent cells **2)** ... into two or more daughter cells.
2. In actively **3)** ... animal cells, the process of mitosis takes about one hour.
3. There are two possible mechanisms of asymmetric cell **4)** ...: **5)** ... asymmetry and environmental asymmetry.
4. Mitosis is conventionally **6)** ... into five stages.
5. In cell **7)** ..., the cell that is **8)** ... is called the "parent" cell.

Exercise 6. Read and translate the text.

CELL

A cell is the structural, functional and biological unit of all organisms. It is an autonomous self-replicating unit that may exist as unicellular organism, or as sub-unit in a multicellular organism.

A cell consists of three principal parts: *the cell membrane*, *the nucleus*, and *the cytoplasm*. Within the cytoplasm lie minuscule but distinct structures called *organelles* that perform certain tasks within the cell.

Human cells consist of the following essential components:

- Cytoplasm: a jelly-like fluid with water, salts, and proteins.
- Cytoskeleton: a network of fibers shaping the cell, aiding division and movement.
- Endoplasmic reticulum (ER): processing and transporting molecules.
- Golgi apparatus: packaging processed molecules for transport.
- Lysosomes and peroxisomes: digesting invaders, detoxifying, and recycling.
- Mitochondria: complex organelles producing energy.
- Nucleus: commanding growth, maturation, division, and housing DNA.

- Cell membrane: separating the cell, regulating material exchange.
- Ribosomes: synthesizing proteins.

Cells are categorized as *prokaryotic* (lacking a nucleus) or eukaryotic (having a true nucleus).

A typical prokaryotic cell might contain the following parts:

Cell wall: the membrane surrounding and protecting the cell

Cytoplasm: all of the material inside a cell except the nucleus

Flagella and pili: protein-based filaments found on the outside of some prokaryotic cells

Nucleoid: a nucleus-like region of the cell where genetic material is kept

Plasmid: a small molecule of DNA that can reproduce independently.

The cell cycle is an ordered series of events involving cell growth and cell division that produces two new daughter cells. The cell cycle has two major phases: **interphase** and **the mitotic phase** (M phase). During interphase, the cell grows and DNA is replicated.

Mitosis is a form of eukaryotic cell division in which one cell (the mother) divides to produce two new cells (the daughters) that are genetically identical to itself. Mitosis is divided into five stages: **prophase**, **prometaphase**, **metaphase**, **anaphase** and **telophase**.

Exercise 7. Answer the questions.

1. What is a cell, and why is it considered the basic unit of life?
2. How does the structure of a cell vary between unicellular and multicellular organisms?
3. What are the primary components of a human cell?
4. What functions do human cells perform within the body?
5. What are organelles, and what roles do they play within a cell?
6. Can you list the major parts of a human cell and describe their functions?

7. How are prokaryotic cells different from eukaryotic cells, and what are some examples of each?
8. What is the cell cycle, and what are its major phases?
9. Explain the process of mitosis and its significance in cell division.

TISSUES

The term **tissue** is used to describe an aggregation of cells that are similar in structure and perform a specific function. **Histology** is the field of study that involves the microscopic examination of tissue appearance, organization, and function.

Tissues vary in physical properties, being hard (bone), soft (muscle), or liquid (blood). They fall into four categories: epithelial, connective, muscle, and nervous, collectively contributing to overall body health.

Epithelial tissue provides a covering for deeper body layers and protects our body from moisture loss, bacteria, and internal injury. There are two kinds of epithelial tissues:

- ***Covering and lining epithelium*** covers or lines almost all of our internal and external organismal surfaces such as the skin, the airways, the lymph vessels and the digestive tract. It serves functions of protection, secretion, and absorption, and is separated from other tissues below by a basal lamina.
- ***Glandular epithelium*** secretes hormones or other products such as stomach acid, sweat, saliva, and milk.

Connective tissue generally provides structure and support to the body. There are two types of connective tissue:

- ***Loose connective tissue*** holds structures together. For example, loose connective tissue holds the outer layer of skin to the underlying muscle tissue. This tissue is also found in your fat layers, lymph nodes, and red bone marrow.

• **Fibrous connective tissue** also holds body parts together, but its structure is a bit more rigid than loose connective tissue. Fibrous connective tissue is found in ligaments, tendons, cartilages, and bones.

Nervous tissue forms the nervous system, which is responsible for coordinating the activities and movements of your body through its network of nerves. Parts of the nervous system include the brain, spinal cord, and nerves. **Nervous tissue** consists of two kinds of nerve cells *neurons* and *neuroglia, or glial* cells.

Muscle tissue contracts forcefully when excited, providing movement. There are three kinds of muscle tissues:

- **Skeletal (striated) muscle** tissue is attached to bones and move the skeleton (also called voluntary muscle)
- **Cardiac muscle** tissue makes up most of the heart wall allowing the heart to contract and pump blood throughout an organism (also involuntary muscle).
- **Smooth (visceral) muscle** tissue lines the walls of blood vessels and certain organs such as the digestive and urogenital tracts.

Tissue membranes, either connective or epithelial, cover various body areas and organs, such as synovial membranes (lining movable joints), mucous membranes (lining cavities connecting to the exterior), and serous membranes (covering internal cavities and organs). The skin is an epithelial membrane protecting from external factors.

Exercise 8. Answer the questions.

1. What is the purpose of tissues in the human body?
2. How is histology related to the study of tissues?
3. What are the four broad categories of tissues in the human body, and what are their primary functions?
4. How does epithelial tissue protect the body from external factors?
5. Describe the different types of epithelial tissues and their functions.
6. What are the roles of connective tissue in the body, and what are its two main types?

7. How does nervous tissue contribute to the functioning of the nervous system?
8. What are the three types of muscle tissues, and where are they found in the body?
9. Explain the roles of tissue membranes in the body.

Exercise 8. Match the terms to the definitions.

Cytoplasm	a) a membrane-bound organelle of eukaryotic cells that is responsible for packaging proteins and lipids into vesicles for delivery to targeted destinations.
Cytoskeleton	b) a cell organelle containing enzymes that digest particles and that disintegrate the cell after its death.
Endoplasmic reticulum	c) a membrane-bound structure that contains a cell's hereditary information and controls its growth and reproduction.
Golgi apparatus	d) a biological structure that separates the interior of all cells from the outside environment (the extracellular space) which protects the cell from its environment.
Lysosome	e) a system of fibres that is present in the cytoplasm of eukaryotic cells to maintain the cell's shape.
Mitochondrion	f) a sphere-shaped structure within the cytoplasm of a cell that is composed of RNA and protein and is the site of protein synthesis.
Nucleus	g) all of the material within a cell, enclosed by the cell membrane, except for the cell nucleus.
Plasma membrane	h) the cell's hereditary material that contains instructions for development, growth and reproduction.
Ribosome	i) an organelle in the cytoplasm of cells that functions in energy production.
DNA	j) a network of tubes within a cell that transports substances inside the cell.

Exercise 9. Put questions to the underlined words.

- 1) The Golgi apparatus or Golgi complex was named after Camillo Golgi, an Italian biologist.
- 2) Eukaryotic cells have a nucleus and membrane bound organelles.
- 3) If you have a microscope of a higher magnification, you can see a smaller spherical body found in the nucleus called the nucleolus.
- 4) Cells were discovered by Robert Hooke in 1665.
- 5) The DNA of a prokaryotic cell consists of a single circular chromosome.
- 6) The eukaryotic DNA is organized in one or more linear molecules, called chromosomes.
- 7) Motile eukaryotes can move using motile cilia or flagella.
- 8) In 1855, Rudolf Virchow stated that new cells come from pre-existing cells by cell division.

Exercise 10. Fill in the gaps with the appropriate preposition.

- 1) All living organisms can be sorted ... one of two groups depending ... the fundamental structure of their cells: the prokaryotes and the eukaryotes.
- 2) One of the main differences ... prokaryotic and eukaryotic cells is the nucleus.
- 3) Prokaryotes also differ ... eukaryotes in that they contain only a single loop ... stable chromosomal DNA stored ... an area named the nucleoid,
- 4) Eukaryotic cells have a true nucleus, which means the cell's DNA is surrounded ... a membrane.
- 5) The nucleus is responsible ... storing chromatin (DNA plus proteins) ... a gel-like substance called the nucleoplasm.
- 6) Flagella are used ... locomotion, while most pili are used to exchange genetic material during a type ... reproduction called conjugation.
- 7) Organelle is a specialized structure found ... cells that carries ... a specific life process.
- 8) Lysosomes are organelles that contain enzymes capable ... breaking down all types ... biological polymers—proteins, nucleic acids, carbohydrates, and lipids.

Exercise 11. Match the terms with their definitions:

1. gland	a) the delicate web (network) of connective tissue that surrounds and supports nerve cells;
2. glia	b) an animal tissue consisting of one or more layers of closely packed cells covering the external and internal surfaces of the body;
3. layer	c) any thread-shaped structure, such as a nerve fibre;
4. hyaluronan	d) a cell or organ in man and other animals that synthesizes chemical substances and secretes them for the body to use or eliminate, either through a duct or directly into the bloodstream;
5. fiber	e) a thickness of some homogeneous substance, such as a stratum (слой, пласт) or a coating on a surface;
6. muscle	f) a cell specialized to conduct nerve impulses: consists of a cell body, axon, and dendrites;
7. fibroblast	g) a part of an organism consisting of a large number of cells having a similar structure and function;
8. neuron(e)	h) a tissue composed of bundles of elongated (продолговатый) cells capable of contraction and relaxation to produce movement in an organ or part;
9. epithelium	i) a cell in connective tissue which produces collagen and other fibers;
10. tissue	j) is a clear, gooey substance that is naturally produced by your body.

Exercise 12. Crossword:

1.				t						
2.				i						
		3.		s						
			4.	s						
	5.			u						

6.		e		
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1. One of the types of tissue, which can be simple, stratified, pseudostratified, and transitional.
2. Noncellular substance surrounding the cells of connective tissue.
3. Bone-forming cell.
4. One of the types of muscular tissue.
5. Cells in the nervous system other than neurons.
6. The fundamental unit of every living organism.

Exercise 13. Memorize the following terms:

Classification of Epithelium

Types of epithelium	Shape of cells
Simple (single layer of cells)	Squamous Cuboidal Columnar
Stratified (more than one layer of cells)	Squamous Cuboidal Columnar
Pseudostratified (modification of simple epithelium)	Columnar
Transitional (modification of stratified epithelium)	Roughly cuboidal or many surfaced

Exercise14. Read additional information about tissue:

1. The major types of epithelia are simple and stratified squamous epithelia, simple and stratified cuboidal epithelia, simple, pseudostratified and stratified columnar epithelia, and transitional epithelium.

2. Simple epithelium generally is involved in diffusion, filtration, secretion, or absorption.
3. Squamous cells function in diffusion and filtration.
4. Cuboidal or columnar cells secrete or absorb.
5. Connective tissue cells are blast cells (form the matrix), cyte cells (maintain it), and clast cells (break it down for remodeling).
6. The cells' names end with suffixes according to the cells' functions as blasts, cytes, or clasts.
7. Fibroblasts are cells that form fibrous connective tissue, and chondrocytes are cells that maintain cartilage (chondro means cartilage).
8. Osteoblasts form bone (osteo- means bone), osteocytes maintain it, and osteoclasts break it down.

Exercise 15. Read the text and insert words from the brackets into the gaps.

*Tissue, skin, connective, muscle, walls, cells, impulses,
organ, epithelial, protection, smooth, internal.*

Many different tissues grouped together create an 1. _____, which has a specific job. An example of an organ would be the stomach. Epithelial 2. _____ covers the body surface and forms the lining for most internal cavities. The major function of 3. _____ tissue includes protection, secretion, absorption, and filtration. The 4. _____ is an organ made up of epithelial tissue which protects the body from dirt, dust, bacteria and other microbes that may be harmful. Connective tissues perform a variety of functions including support and 5. _____. Fat tissue, dense fibrous tissue, cartilage, bone, blood, and lymph are all considered 6. _____ tissue. There are three types of muscle tissue: skeletal, 7. _____ and cardiac. Skeletal 8. _____ is a voluntary type of muscle tissue that is used in the contraction of skeletal parts. Smooth muscle is found in the walls of 9. _____ organs and blood vessels. It is an involuntary type. The cardiac muscle is found only in the 10. _____ of the heart and is

involuntary in nature. Nerve tissue is composed of specialized 11. _____ and conducts 12. _____ to and from all parts of the body. Nerve cells or neurons are long and string-like.

Exercise 16. Put questions to underlined words:

1. Histopathology refers to the microscopic examination of tissue in order to study the manifestations of disease.
2. Specifically, in clinical medicine, histopathology refers to the examination of a biopsy or surgical specimen by a pathologist.
3. In contrast, cytopathology examines free cells or tissue fragments.
4. Histopathology deals with the microscopic study of diseased tissue.
5. Accurate diagnosis of cancer and other diseases usually requires histopathological examination of samples.
6. Trained medical doctors perform histopathological examination and provide diagnostic information based on their observations.
7. The trained personnel who prepare histological specimens for examination are histotechnicians, histology technicians (HT), histology technologists (HTL), medical scientists, medical laboratory technicians, or biomedical scientists.
8. The field of study of technologists, medical laboratory technicians, or biomedical scientists is called histotechnology.

Self-check

I. Answer the questions:

1. What is a cell, and why is it considered the basic unit of life?
2. How does the structure of a cell vary between unicellular and multicellular organisms?
3. What are the primary components of a human cell?
4. What functions do human cells perform within the body?
5. What are organelles, and what roles do they play within a cell?
6. Can you list the major parts of a human cell and describe their functions?
7. How are prokaryotic cells different from eukaryotic cells, and what are some

examples of each?

8. What is the cell cycle, and what are its major phases?
9. Explain the process of mitosis and its significance in cell division.
10. What is the purpose of tissues in the human body?
11. How is histology related to the study of tissues?
12. What are the four broad categories of tissues in the human body, and what are their primary functions?
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14. Describe the different types of epithelial tissues and their functions.
15. What are the roles of connective tissue in the body, and what are its two main types?
16. How does nervous tissue contribute to the functioning of the nervous system?
17. What are the three types of muscle tissues, and where are they found in the body?
18. Explain the roles of tissue membranes in the body.

II. Define the terms: Cell, Cell Cycle, Mitosis, Meiosis, Tissues

HUMAN BODY

Exercise 1. Key words:

verb	noun	adjective
breathe	attachment	entire
compose	breath	
comprise	buttock	
concern (<i>with</i>)	esophagus	
contain	gallbladder	
deal (<i>with</i>)	heart	
protect	intestines	
support	skull	
	stomach	
	thumb	
	toe	
	tongue	
	trunk (torso)	
	wrist	

Exercise 2. Pronounce correctly:

Sight [sait], tongue [tʌŋ], through [θru:], lower ['lə(o)ʊə], framework ['freɪmwɜ:k], facial ['feɪʃ(ə)l], ear ['ɪə], thigh ['θaɪ], knee [ni:], calf ['kɑ:f], abdomen ['æbdəmən], muscle ['mʌsl], palate ['pælət], equilibrium [i:kwi 'lɪbrɪəm], eyelash ['aɪlæʃ], homeostasis [həʊmiəʊ'steɪsɪs], wrist [rɪst], palm [pɑ:m]

Exercise 3. Divide the words into two columns – nouns and adjectives.

Example:

Nouns	Adjectives
<i>heart</i>	<i>cardiac</i>
<i>neck</i>	<i>cervical</i>

Facial, face, lung, anatomical, buccal, palate, skull, nasal, cranial, cheek, functional, renal, gastric, body, ear, groin, tongue, pulmonary, eye, liver, muscular, lingual, mouth, structure, oral, kidney, palatine, hepatic, skin, nose, cutaneous, ocular, auricle, bodily, inguinal, stomach, lip, labial, anatomy, function, structural, muscle.

Exercise 4. Read and translate the sentences. Pay attention to the sentences with the Passive Voice:

1. The student **was asked** about the structure of the human body.
2. Human Anatomy **is taught** in practical classes.
3. The lecture in Human Anatomy **will be delivered** tomorrow.
4. The human body **is made** up of carbon, calcium and phosphorus.
5. The lectures in Anatomy **were attended** by all students.
6. The skeleton **is composed** of bones.
7. The atlas of Anatomy **was composed** by R.D. Sinelnikov.
8. Anatomical dissections for research and analysis **are performed** in a dissecting room.
9. Tomorrow the students **will be asked** about the structure of the human body.

Human Anatomy **is taught** in the first year

Exercise 5. Read the text:

Human body

The human body is the entire structure of a human being that comprises such principle parts of the body as head, neck, trunk (torso) and extremities (limbs).

Every part of the human body is composed of various types of cells, the fundamental structural units of all living creatures. The most part of the human body is covered with the skin.

The head as the upper or front part of the body consists of 2 parts: the skull that contains the brain and the face that includes the forehead, eyes, nose, mouth, cheeks, ears and chin.

Each eye has the eyelids and the eyelashes that grow along the edge of the eyelids. There are the eyebrows over our eyes. The eyes serve as the organ of sight.

The nose is the organ of smell through which we breathe.

The ear (which is the organ of hearing) includes three principal parts: the external ear, the middle ear and the internal ear.

The mouth has 2 lips: the upper and the lower lip. The tongue (which is the organ of taste), teeth and hard and soft palates are located in the mouth.

The head is connected with the trunk by the neck.

The upper part of the trunk is called the chest. The principal organs in the chest are the lungs, the heart and the esophagus.

The lower part of the trunk is called the abdomen. It contains the stomach, the liver, the spleen, the pancreas, the intestines, the kidneys, the gallbladder and the bladder.

The surface of the body from the neck to the buttocks is called the back.

The waist is the narrow middle part of the body above the hips.

When we speak of the upper extremity we mean the arm. The upper extremity is connected with the chest by the shoulder. It consists of the upper arm, the forearm, the elbow, the wrist and the hand. We have five fingers on each hand. A short finger set apart from the other is called the thumb. The inner surface of the hand is called the palm.

The lower extremity is called the leg. It consists of the thigh (hip), the knee, the calf, the ankle and the foot. There are five toes on each foot. The nail is a hard part at the end of a toe and a finger.

The bones of the body are covered with the muscles. The framework of bones consisting of inorganic material is called the skeleton. It supports and protects the soft parts of the human body and provides attachment for muscles.

Anatomy and Physiology study the human body. Human Anatomy is the scientific study of the form and structure of organisms. Physiology focuses on the systems and organs of the human body and their functions. All systems of the human body interact in order to maintain homeostasis i.e. metabolic equilibrium within our organism.

Exercise 6. Answer the following questions:

1. What does the human body consist of?
2. What chemical elements is the human body made up of?
3. What are the principal parts of the human body?
4. What parts does the head consist of?
5. What does the face include?
6. Where is the brain located?
7. What is the organ of taste?
8. What is the organ of sight?
9. What do ears serve as?

10. What are the principal organs in the chest?
11. What organs are there in the abdomen?
12. What do we mean under the term “the upper/lower extremity”?
13. What material do the bones consist of?
14. What is homeostasis?

Exercise 7. Match the words from two columns. Translate the word combinations and make the sentences of your own:

human	parts
entire	systems
principal	palates
biological	part
chemical	extremity
hard and soft	study
narrow middle	structure
lower	equilibrium
scientific	elements
metabolic	body

Exercise 8. Complete the sentences:

1. The skull *consists of*
2. The face *consists of*
3. The ear *consists of*
4. The upper extremity *consists of*
5. The lower extremity *consists of*
6. The skull *contains*
7. The chest *contains*
8. The abdomen *contains*
9. The skeleton *protects*...
10. Human Anatomy *studies* ...

Exercise 9. Fill in the blanks with prepositions:

1. The nose is the organ ... smell.
2. We breathe ... the nose.
3. The head is connected ... the trunk ... the neck.
4. The teeth are located ... the mouth.
5. We have 5 fingers ... each hand.
6. The skeleton provides attachment ... muscles.
7. Physiology focuses ... the systems and organs of the human body.
8. A short finger set apart ... the other is called the thumb.
9. The waist is the narrow middle part of the body ... the hips.
10. The surface of the body... the neck ... the buttocks is called the back.

Exercise 10. Match the words with their definitions:

1. finger	a) any of the digits of the hand.
2. knee	b) the joint between the thigh and the lower leg.
3. tongue	c) the movable muscular organ in the mouth that is used for tasting and eating food and for speaking.
4. chest	
5. arm	d) the part of the body between the neck and the abdomen.
6. neck	e) an upper limb of the human body.
7. lungs	f) the part of an organism connecting the head with the rest of the
8. torso	body.
9. heart	g) a pair of breathing organs in the chest.
10. tooth	h) the part of the body excluding the head, neck, and limbs
	i) the muscular organ that pumps the blood.
	j) any of various bonelike structures set in the jaws

Exercise 11. Read the definitions below. What parts of the body do they describe?

1. ... - any of the digits of the hand.
2. ... - a joint between the thigh and the lower leg.
3. ... - a part of the head between the natural hairline and the eyes.

4. ... - a movable muscular organ in the mouth that is used for tasting and eating food and for speaking.
5. ... - an upper limb of the human body.
6. ... - a part of the body connecting the head with the rest of the body.
7. ... - a finger used for pointing at objects.
8. ... - a part of the body between the neck and the abdomen.
9. - a finger between a long finger and a little finger.
10. – the largest organ of the body forming its external covering.

Exercise 13. Write down synonyms to these words:

Gullet –	Encephalon –	Limb –	Vision –
Thorax –	Torso –	Cranium –	Hip

Exercise 14. Correct the mistakes in the following sentences:

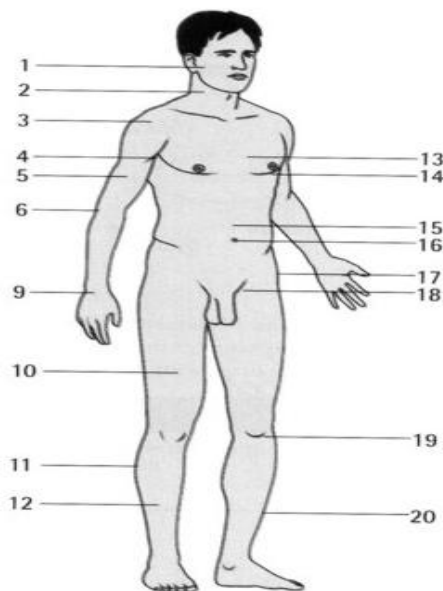
1. The human body consists of the head, the trunk, the limbs, and the extremities.
2. Each foot has five fingers.
3. The hand consists of the upper arm, the elbow, the forearm, the wrist and the upper limb.
4. The liver and the gallbladder are located in the chest.
5. The upper part of the trunk is called the chest.
6. The humans have twelve fingers on the arms.
7. There are 32 teeth in the mouth.
8. The body is covered with the muscles and the bones are covered with the skin.
9. The upper part of the trunk is the abdomen and it includes the lungs, the heart and the oesophagus (gullet).
10. Anatomy studies the functions and Physiology studies the structure of the human body.

Exercise 15. Put the words from the box instead of the gaps:

<i>wrist</i>	<i>neck</i>	<i>feet</i>	<i>shoulder</i>	<i>oesophagus</i>	<i>kidneys</i>	<i>knee</i>	<i>waist</i>
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1. _____ is a part of the body which joins the head and trunk.
2. _____ is a thin tube extending from the mouth to the stomach through which food passes.
3. _____ is a part of the arm on which we wear watches.
4. _____ is a line, located above the hips and dividing upper and lower parts of the trunk.
5. _____ is a part of the arm by which the arm is joined to the trunk.
6. _____ is a part of the arm with which we take something.
7. _____ are the parts of the body on which we stand.
8. _____ protects the brain from injuries.
9. A double organ of urinary system is _____
10. _____ is a junction between the upper and lower parts of the leg.

Exercise 16. Write down the names of the parts of the body:



Exercise 17. Put questions to the underlined words:

1. The skeleton protects the organs from injury.
2. There are two kidneys in the human body.
3. Many scientists studied the structure of the human body.
4. The lower part of the trunk is called abdomen.

5. The bones are covered with muscles.
6. The most sensitive finger on the human hand is the index finger.
7. There are 15 students present in the class.
8. Sigmund Freud studied the human brain disorders.
9. The mouth consists of 32 teeth.
10. We have 5 fingers on each hand.

Exercise 18. Open the brackets using Active and Passive Voice:

1. She (to cut) her finger yesterday.
2. The elbow (to connect) the upper arm and the forearm.
3. When he (to be) 10 years old he (to jump) from the roof and (to break) his ankle.
4. The heart (to include) in the chest.
5. In 1543, the book “On the Structure of the Human Body” (to write) by the famous anatomist, Andreas Vesalius.
6. The skull (to protect) the brain from injury.
7. The surface of the human body (to cover) by the skin.
8. The eyelashes (to grow) along the edges of the eyelids.
9. The skeleton (to provide) attachments for muscles.
10. Little children always (to point) at objects.

*** Exercise 19. Complete the following sentences using a verb (in an appropriate tense) which denotes a part of the body.**

1. You have no money. _____ the facts. You can't waste money as if you are rich.
2. Could you _____ me that book next to you? Thank you.
3. In the final minutes of the match Robson _____ the ball into the gates.
4. She _____ the car carefully out of the garage.
5. After his father's death, he had to _____ the responsibility for the family's debts.
6. She _____ the material gently. It felt as smooth as silk. She could make a wonderful dress from it.

7. The bank robber was _____ with a gun.
8. I ran out of petrol on the road, so I had to _____ a lift to the nearest petrol station.

Exercise 20. Speak about the human body according to such points:

- a) major parts of the human body;
- b) major parts of the upper extremity;
- c) major parts of the lower extremity;
- d) vital organs of the human body.

Self-check

I. Answer the questions:

1. What is the human body?
2. What does the human body consist of?
3. What are the principal parts of the human body?
4. What parts does the head consist of?
5. What does the face include?
6. Where is the brain located?
7. What is the organ of taste and sight?
8. What is the function of the eyes?
9. What organ do we breathe through?
10. What are the principal organs in the chest?
11. What organs are there in the abdomen?
12. What does the upper extremity consist of?
13. What does the lower extremity consist of?
14. What supports the soft parts and protects the organs from injury?
15. What sciences study the human body?

II. Define the terms:

Human body, head, trunk, chest, abdomen, upper extremity, lower extremity

Systems of the Human Body

Exercise 1. Key words:

verb	noun	adjective
communicate	ability	accessory
contribute	activity	associated
interact	chyme	circulatory
maintain	aggregation	integumentary
nourish	digestion	salivary
permit	elimination	
process	equilibrium	
	excess	
	gamete	
	fertilization	
	indigestion	
	ingestion	
	means	
	pylorus <i>pl</i> pylori	
	testis	
	well-being	

Exercise 2. Read the following paying attention to the rules of reading:

c - [s] before e, i, y – place, cell, acid, circulatory, process, accessory, excess, maintenance

c - [k] except before e, i, y - ducts, carbon, testicle, contribute, endocrine, pancreas, excrete

g – [dʒ] before e, i, y – age, agent, oxygen, digestion, ingestion, digestive, cartilage, charged

g - [g] except before e, i, y - group, gland, gauze, organism, aggregation, ligament, gamete

Exercise 3. Pronounce correctly and translate:

Associated [ə'səʊʃieɪtɪd]; skeleton ['skelɪt(ə)n]; circulatory ['sɜ:kjʊlətəri]; digestive [daɪ'dʒestɪv]; respiratory [rɪs'paɪərətəri]; electrolyte [ɪ'lektro(ʊ)laɪt]; urinary ['ju(ə)rɪn(ə)rɪ]; endocrine ['endəʊkr(a)ɪn]; musculoskeletal [mʌskjʊləʊ'skɛlɪtəl]; undigested [ʌndaɪ'dʒgestɪd]; material [mə'tɪ(ə)rɪəl]; Helicobacter pylori [ˌhelɪkə 'bæktə paɪ 'lɔ:raɪ]; isolation [aɪs(ə)'leɪʃ(ə)n]; ion ['aɪən]; adenoids ['ædɪ'nɔɪdz]; regulatory ['regjələɪt(ə)rɪ]; homeostasis [həʊmiəʊ'steɪsɪs]

Exercise 4. Guess the meaning:

Amino acids, electrolytes, oxygen, carbon dioxide, hormones, to stabilize, ions, aggregation, homeostasis, absorption, pH level, reproductive, nervous, urethra, molecules, to circulate, to transport, fluid, lymph, thymus, adenoids, regulatory, immune, tonsils, arterioles, Helicobacter pylori.

Exercise 5. Read and translate the text:

Systems of the Body

System of the body is a group of organs that work together to perform a certain task. The human body consists of many interacting systems. Each system contributes to the maintenance of homeostasis* of itself, other systems, and the entire body. A system consists of two or more organs, which are functional collections (aggregation) of tissue. Systems do not work in isolation, and the well-being of the person depends upon the well-being of all the interacting body systems. The major systems of the human body are as follows: musculoskeletal, nervous, circulatory, digestive, respiratory, urinary, endocrine, reproductive and other systems.

The musculoskeletal system consists of the human skeleton, which includes bones, ligaments, tendons and attached muscles. It gives the body basic structure and the ability for movement.

The nervous system consists of the brain and spinal cord, nerves, ganglia and receptors. It is a complex information system with all the necessary means for receiving, processing, and communicating information.

The circulatory system, also called the cardiovascular system, is an organ system that permits blood to circulate and transport nutrients (such as amino-acids and electrolytes), oxygen, carbon dioxide, hormones, and blood cells to and from cells in the body to nourish it and help to fight diseases, stabilizing body temperature and pH level, and maintaining homeostasis.

The human digestive system consists of the alimentary tract and several accessory organs such as the salivary glands, pancreas and gall bladder. It is responsible for converting food into energy.

The respiratory system consists of the lungs, the air passages leading to them and associated structures. It brings oxygen from the air to the lungs and excretes carbon dioxide and water back into the air.

The urinary system consists of the kidneys, two ureters, bladder, and urethra. It removes water from the blood to produce urine, which carries a variety of waste molecules and excess ions and water out of the body.

The endocrine system consists of a number of glands throughout the body which produce regulatory substances called hormones. The endocrine system serves to regulate a large number of activities.

The lymphatic system is a network of organs, lymph nodes, lymph ducts, and lymph vessels that make and move lymph from tissues to the bloodstream. The lymph system is a major part of the body's immune system. It includes the tonsils, adenoids, spleen, and thymus. Lymph nodes make immune cells that help the body fight infection. They also filter the lymph fluid and remove foreign material such as bacteria and cancer cells.

The reproductive system or genital system is a system of sex organs within an organism which work together for the purpose of sexual reproduction. The sex glands produce the germ cells that unite and grow into a new individual.

The integumentary system consists of the largest organ in the body, the skin. This system protects the body from damage, prevents dehydration, stores fat and produces vitamins and hormones. The integumentary system is the body's first line of defense against bacteria, viruses and other microbes. The skin is a sensory organ in that it has receptors for detecting heat and cold, touch, pressure and pain. Components of the skin include hair, nails, sweat glands, oil glands, blood vessels, lymph vessels, nerves and muscles.

* - a physiological process by which the internal systems of the body such as blood pressure, body temperature and acid-base balance are maintained at equilibrium.

Exercise 6. Answer the questions:

1. What are the major body systems of the human?
2. What does the musculoskeletal system consist of?
3. What system helps us to receive, process, and communicate information?
4. What is the main function of the circulatory system?
5. What system is responsible for converting food into energy.?
6. What organs does the urinary system include?

7. What body system brings oxygen from the air to the lungs and excretes carbon dioxide and water back into the air?
8. What are the major organs of the lymphatic system?
9. What is the purpose of the reproductive system?
10. What are the functions of the integumentary system?
11. What physiological process helps to maintain the internal systems of the body at equilibrium?
12. What does the well-being of any person depend upon?

Exercise 7. Find the organs corresponding to the following human body systems:

Lymphatic system	the heart, blood and blood vessels
Musculoskeletal system	the alimentary canal, the salivary glands, pancreas and gall bladder
Reproductive system	the pineal gland, pituitary gland, pancreas, ovaries, testes, thyroid gland, parathyroid gland, hypothalamus, gastrointestinal tract and adrenal glands
Digestive system	skin, hair, nails, sweat and other exocrine glands
Nervous system	lymph nodes, lymph ducts, and lymph vessels
Integumentary system	bones, ligaments, tendons and attached muscles
Respiratory system	brain and spinal cord, nerves, ganglia and receptors
Urinary system	ovaries, fallopian tubes, uterus, cervix, vagina//bladder, prostate, urethra, penis, testicles
Cardiovascular system	the airway, the lungs, and the muscles of respiration
Endocrine system	the kidneys, two ureters, bladder, and urethra

Exercise 8. Match the synonyms:

contribute	include
collection	blood flow
Cardio-vascular	transform

consist	save
communicate	protection
convert	remove
associate	cause
excrete	circulatory
bloodstream	transmit
store	aggregation
defence	accompany

Exercise 9. Insert into the gaps the words from the box:

excreting waste, the pancreas, homeostasis, bloodstream, blood pressure and volume, hormone, the heart and blood vessels, interacting systems, the brain

1. The term _____ refers to a system that regulates its internal environment and maintains a stable, relatively constant condition.
2. Many _____ and mechanisms act to maintain the human's internal environment.
3. The nervous system receives information from the body and transmits this to _____ via neurotransmitters.
4. The endocrine system may release hormones to help regulate _____.
5. Cell metabolism may help the blood's PH.
6. The digestive (or gastrointestinal) system, extending from the mouth to the anus, is responsible for receiving and digesting food and.
7. The cardiovascular system, including _____ is responsible for pumping and circulating the blood.
8. Hormones travel to other organs through _____ and regulate the function of those organs, for example, the thyroid gland produces thyroid _____, which controls the metabolic rate and _____ produces insulin, which controls the use of sugar.

Exercise 10. Match the following systems of the human body to the functions they perform:

1. Respiratory system	-largest sensory organ -vitamin D syntheses -protects deeper tissue -regulates fluid and blood loss
2. Reproductive system	-stores calcium -framework for the body -protects vital organs -produces red blood cells
3. Integumentary system	-generates heat -creates movement -maintains posture -uses energy
4. Muscular system	-portions of many different systems that fight disease
5. Endocrine system	-maintains fluid balance to defend the body against disease by producing lymphocytes
6. Urinary system	-transportation of nutrients and gas waste -supports immune function
7. Digestive system	-gets rid of nitrogenous waste out of blood -regulates electrolytes, fluid and pH balance
8. Lymphatic system	-breaks down food into the building blocks for the body
9. Cardiovascular system	-portions moistens and heats air -gas exchange
10. Skeletal system	-sensory input -interpretation of input or thought -elicits and signals responses -coordination of muscles

11. Immune system	-secretes hormones that regulate growth, metabolism and general body function
12. Nervous system	- production offspring -production of hormones

Exercise 11. Open the brackets and insert the prepositions where it is necessary.

with; of; without; between; by; on

Homeostasis

Homeostasis (to be) the term used to describe how the body maintains its normal composition and functions. Because organ systems communicate ... each other, the body (to be able) to maintain stable amounts ... internal fluids and substances. Also, the organs neither underwork nor overwork, and each organ (to facilitate) the functions ... every other organ.

Communications to maintain homeostasis (to occur) ... means ...the autonomic nervous system and the endocrine system. Special chemicals called transmitters (to carry) ... the communications.

The autonomic nervous system largely controls the complex communication network that regulates bodily functions. This part ... the nervous system functions ... a person's thinking about it and without much noticeable indication that it is working. Transmitters called neurotransmitters (to conduct) messages ... parts ... the nervous system and between the nervous system and other organs.

Exercise 12. Use the words in CAPITALS to form and adjective instead of the gaps:

1. The bones in the body form the _____ system.	SKELETON
2. Tendons connecting muscles to bones are _____, allowing the body to move.	FLEX

3. Bone is more _____ than cartilage.	RESIST
4. The skull consists of the _____ and _____ skeleton.	CRANIUM, FACE
5. The bone surrounds a _____ blood vessel.	CENTRE
6. A bone has a tough _____ outer membrane.	COLLAGEN
7. Some bones have a _____ function.	PROTECT
8. _____ contraction changes the length of the muscle.	MUSCLE

Exercise 13. Choose the proper Participle:

1. System of the body is a group of organs (*working/worked*) together to perform a certain task.
2. The bottom of the thoracic cavity (*forming/formed*) by the diaphragm plays a leading role in breathing.
3. The musculoskeletal system (*consisting/consisted*) of the bones, ligaments, tendons and attached muscle gives the body basic structure and the ability for movement.
4. Arteries (*dividing/ divided*) into smaller vessels are called arterioles.
5. The circulatory system (*permitting/ permitted*) blood to circulate transports nutrients and helps to fight diseases.
6. The urinary system (*removing/ removed*) water from the blood produces urine carrying a variety of waste molecules and excess ions and water out of the body.
7. Bile (*producing/produced*) by the liver enters the duodenum through the common bile ducts.
8. Oestrogen (*involving/ involved*) in the development of female sexual features such as breast growth accumulated the body fat around the hips and thighs.

Exercise 14. Put questions to the underlined parts of the sentences:

1. The earliest operations on the pericardium taken place in the 19th century were performed by Romero and Dalton.

2. The immune system will respond to *Helicobacter* by sending white cells, killer T cells and other infection-fighting agents to restore it.
3. The gas moving through the larynx, pharynx and mouth allows humans to speak, or phonate.
4. In 1956, Forssmann and Richards were awarded the Nobel Prize in Medicine for their discoveries.
5. Some neurologists have just examined the patient with the severe disturbed brain circulation.
6. Disorders of the respiratory system are usually treated internally by a pulmonologist and respiratory therapist.
7. In 1242, the Arabian physician became the first person accurately described the process of pulmonary circulation.
8. All additional investigations in order to maintain acid-base balance will have been completed by our immunologists by next week.

Exercise 15. Open the brackets and put the verbs into an appropriate tense:

1. Today the patient (to feel) better than yesterday.
2. We (to graduate) from the University in 5 years.
3. The nurse (to determine) the patient's blood group 1 hour ago.
4. Bacteria (to cause) inflammation of the gums.
5. Dentistry (to become) a medical specialty a little over a hundred years ago.
6. The professor (to deliver) an interesting lecture in Biology in 2 days.
7. The patient (take) antihistamines in large doses yesterday.
8. The human heart (to make) 60-80 contractions per min.

Exercise 16. Arrange the following sentences in a correct order to describe the notion

“Systems of the body”:

1. System of the body is a group of organs that work together to perform a certain task.

2. The major systems of the human body are as follows: musculoskeletal, nervous, circulatory, digestive, respiratory, urinary, endocrine, reproductive and other systems.
3. As the systems do not work in isolation the well-being of each person depends upon the well-being of all the interacting body systems.
4. Each system contributes to the maintenance of homeostasis of itself, other systems, and the entire body.
5. Homeostasis is a physiological process by which the internal systems of the body such as blood pressure, body temperature and acid-base balance are maintained at equilibrium.

Self-check

I. Answer the questions:

1. What are the major body systems of the human?
2. What is the main contribution of each system?
3. What are the major organs of the lymphatic system?
3. What are the functions of the integumentary system?
4. What physiological process helps to maintain the internal systems of the body at equilibrium?
5. What does the well-being of any person depend upon?

II. Define the term: Systems of the body, lymphatic system, integumentary system

THE MUSCULAR-SKELETAL SYSTEM

Exercise 1. Key words:

verb	noun	adjective
comprise	bone marrow	cervical
develop	cartilage	cranial
fuse	breastbone	facial
joint	coccyx	lumbar
	cushion	smooth
	joint	straight
	ligament	
	marrow cavity	
	pelvis	
	rib	
	spine	
	tendon	
	thoracic	
	vertebra, <i>pl</i> vertebrae	

Exercise 2. Write in words (all the words are from the text below):

[,æpən'dɪkjʊlə], [kəm'praɪz], ['fi:mə], [spain], ['kɑ:tɪlɪdʒ], ['steɪpɪ:z], ['mʌsəl],
 ['vɜ:tɪbrə], ['kɒksɪks], [θɔ:'ræsɪk], ['lɪgəmənt], ['seɪkrəl], ['brɛst,bəʊn], ['lʌmbə],
 ['æksɪəl], [ɪk'stremɪtɪ], ['kælsɪəm], ['mærəʊ], ['kævɪtɪ], [skʌl], ['kreɪnɪəl], ['sɜ:vɪkəl],
 [θaɪ], ['fɔ:rɑ:m], ['tɛndən], ['feɪʃəl]

Exercise 3. Give adjectives for the following nouns (you will need to use a dictionary!):

noun	adjective	noun	adjective
------	-----------	------	-----------

brain		chin	
spine		shoulder	
neck		tooth	
vertebra		Tongue	
pelvis		skull	
skin		groin	
thigh		chest	

Exercise 4. Read the text:

The Skeleton

The musculoskeletal system consists of the human skeleton and includes bones, tendons, ligaments and the attached muscles. It gives the body its basic structure and the ability to move.

The skeleton is constructed of bones. A bone is any of the pieces of hard, whitish tissue making up the skeleton in humans. Bones are important in five ways. First, bones are the main support for the body; they give your body shape, the bones that make up your spine allow you to sit up straight, the bones in your legs support the weight of your body so that you can stand up and so on. Another function of your skeleton is movement. Muscles are attached to bones and when muscles move, bones move. Third, bones protect the organs beneath them. The ribs provide protection for the lungs and heart. The skull protects the brain. Fourth, yellow bone marrow stores calcium and fat. Finally, bones are the location where blood cells are produced by the cells of the red bone marrow. Bone marrow is located inside the marrow cavity of bones.

The skeleton can be divided into three basic parts: skull, axial skeleton, and appendicular skeleton. The bones of the skull consist of cranial and facial parts. There are 26 bones in the skull.

The axial skeleton is comprised of the bones that support the trunk. The bones of the trunk are the spinal column or the spine and the chest (ribs and the breastbone). The spine of the

adult consists of 32 or 34 vertebrae. There are seven cervical vertebrae, twelve thoracic vertebrae, five lumbar, five sacral vertebrae and from one to five vertebrae which form the coccyx. The lumbar vertebrae are the largest vertebrae in the spinal column. The chest is composed of 12 thoracic vertebrae, the breastbone and 12 pairs of ribs.

The appendicular skeleton consists of the bones of the arms and legs, along with the bones that attach them to the axial skeleton. The lower extremity consists of the thigh, leg and foot. It is connected with the trunk by the pelvis. The upper extremity is formed by the arm, forearm and hand.

The bones of the skeleton are connected together by joints, cartilages, ligaments and tendons.

The biggest bone in the body is the femur in the upper leg, and the smallest is the stapes bone in the middle ear. In an adult, the skeleton comprises around 14% of the total body weight, and half of this weight is water.

The human skeleton takes 20 years before it is fully developed. There are 206 bones in the adult human skeleton, a number which varies between individuals and with age - newborn babies have over 270 bones some of which fuse together.

Ligaments are strong connective fibers that connect bones to bones. In order to move the joint, the skeletal muscle must have a tendon that crosses over the joint connecting the muscle to the bone that moves at the articulation, so tendons hold muscle to bone. A cartilage is a smooth elastic tissue that coats the ends of the bones to provide a cushion between the bones as they move against each other. A cartilage protects the ends of long bones at the joints.

Exercise 5. Answer the questions:

1. What does the musculo-skeletal system consist of?
2. What is the function of the musculo-skeletal system?
3. What is the skeleton constructed of?
4. Why are bones important? What are their main functions?
5. What is the function of the skull?
6. Where is bone marrow located?

7. What parts can the skeleton be divided into?
8. What does the axial skeleton comprise?
9. What parts does the appendicular skeleton consist of?
10. How many bones are there in the skull of an adult?
11. How are the bone of the body connected together?
12. What are the biggest bone and the smallest bones in the body?
13. What is a ligament?
14. What is the function of a tendon?
15. What is the function of a cartilage?

Exercise 6. Match the words with their definitions:

1. skeleton	a) any of the 24 curved elastic bones that together form the chest wall in man
2. vertebra	b) the spinal column
3. trunk	c) one of the bony segments of the spinal column
4. skull	d) the fatty network of connective tissue that fills the cavities of bones
5. femur	e) the longest thickest bone of the human skeleton, located between the pelvis and the below
6. rib	f) the bony skeleton of the head
7. spine	g) a hard framework consisting of bones that supports and protects the soft parts of a human body and provides attachment for muscles
8. bone marrow	h) the body excluding the head, neck, and limbs

Exercise 7. Fill in the gaps with the words from the box above:

nervous system; axial; spinal column; chest; appendicular; pelvis; vertebrae; joints

1. The axial skeleton is formed by the ..., the chest and the skull.

2. The ... in female skeletons is different from that of males in order to facilitate child birth.
3. The upright posture of humans is maintained by the ... skeleton.
4. The ... between bones allow movement.
5. The ... protect the spinal cord.
6. Muscles, bones, and joints are all coordinated by the
7. The ... skeleton (126 bones) is formed by the upper limbs and the lower limbs.
8. The ... and the spine protect the human lungs, human heart and major blood vessels.

Exercise 8. What terms are described:

1. any of the pieces of hard, whitish tissue making up the skeleton in human;
2. a long flat vertical bone, situated in front of the thorax, to which are attached the collarbone and the first seven pairs of ribs;
3. a small triangular bone at the base of the spinal column in humans consisting of several fused rudimentary vertebrae;
4. one of a series of long curved bones occurring in 12 pairs in humans and extending from the spine to or toward the sternum;
5. a band of strong connective tissue serving to connect bones or hold organs in place;
6. the smallest bone in the human body;
7. a band of tough, fibrous, inelastic tissue that connects a muscle to a bone;
8. the junction between two or more bones.

Exercise 9. Match the synonyms:

maintain	thorax
beneath	over
attach	collarbone
comprise	sternum
spinal column	joint
chest	support
breastbone	consist

femur	joint
articulation	spine
clavicle	thigh
above	under

Exercise 10. Find the right plural form of the noun:

bacillus	bacilli	bacilluses
vertebra	vertebri	vertebrae
coccyx	coccyces	coccyges
bacterium	bacteri	bacteria
alveolus	alveolei	alveoli
gingiva	gingivae	gingivas
fundus	fundi	fundae
nucleus	nuclea	nuclei
coccus	cocci	coccae
fossa	fossi	fossae

Exercise 12. Complete the table with the missing degrees of adjectives:

POSITIVE DEGREE	COMPARATIVE DEGREE	SUPERLATIVE DEGREE
thin		
	easier	
		the worst
	more dangerous	
good		
		the farthest
interesting		
	fatter	
		the softest

happy		
		the sweetest
common		

Exercise 13. Open the brackets using the adjectives in the proper degree of comparison:

1. The lumbar vertebrae are (large) vertebrae in the spinal column.
2. This bone is (long) than that one.
3. He is (experienced) surgeon in this hospital.
4. It is a (good) idea.
5. This exercise is (difficult) than the one we did yesterday.
6. She is the (young) in her family.
7. Is Anatomy (interesting) than Physics for you?
8. That was the (bad) decision he could make.

Exercise 14. Open the brackets using the verb in an appropriate tense (Present, Past, Future Simple Active or Passive Voice):

1. The new equipment (to install) in the emergency room next week.
2. Yellow bone marrow (to store) calcium and fat.
3. The lungs (to protect) by the chest.
4. All the patients at the in-patient department (to examine) two hours ago.
5. The professor (to ask) a lot of questions after his lecture tomorrow.
6. This patient (to complain) of severe headache last week.
7. The doctor (to make) a diagnosis only after he gets the findings of your blood test.
8. The administration (to change), if he doesn't feel better tomorrow.

Exercise 15. Put questions to the underlined words:

1. The chest is composed of 12 thoracic vertebrae, the breastbone and 12 pairs of ribs.
2. He will be administered a bed regimen.
3. Yellow bone marrow stores calcium and fat.
4. The human skeleton takes 20 years before it is fully developed.

5. There are 206 bones in the adult human skeleton.
6. The bones of the skull consist of cranial and facial parts.
7. The upper extremity is formed by the arm, forearm and hand.
8. His temperature will be taken in the morning.

Exercise 16. Make definitions of the terms bone, skeleton, skull using the sentences below:

- a) It protects the brain.
- b) The appendicular skeleton consists of the bones of the arms and legs, along with the bones that attach them to the axial skeleton.
- c) Also, bones protect the organs beneath them.
- d) Bones are the main support for the body.
- e) The skeleton is a hard framework consisting of bones.
- f) The bones of the skull consist of cranial and facial parts.
- g) It supports and protects the soft parts of a human body and provides attachment for muscles.
- h) A bone is any of the pieces of hard, whitish tissue making up the skeleton in humans.
- i) The skull is made of a number of fused flat bones.
- j) The axial skeleton is comprised of the bones that support the trunk.
- k) Bone marrow is located inside the marrow cavity of bones.
- l) There are 26 bones in the skull.
- m) The skeleton can be divided into three basic parts: skull, axial skeleton, and appendicular skeleton.
- n) The skull is the bony skeleton of the head.
- o) Yellow bone marrow stores calcium and fat, red bone marrow produces blood cells.

BONE	SKELETON	SKULL
1.	1.	1.
2.	2.	2.

3.	3.	3.
4.	4.	4.
5.	5.	5.

Self-check

I. Answer the questions:

1. What does the musculo-skeletal system consist of?
2. What is the function of the musculo-skeletal system?
3. What is the skeleton constructed of?
4. Why are bones important? What are their main functions?
5. What is the function of the skull?
6. What parts can the skeleton be divided into?
7. What does the axial skeleton comprise?
8. What parts does the appendicular skeleton consist of?
9. How many bones are there in the skull of an adult?
10. What is a ligament?
11. What is the function of a tendon?
12. What is the function of a cartilage?

II. Define the terms: the skeleton, a bone, the skull, appendicular skeleton, axial skeleton

ANATOMY OF THE CARDIO-VASCULAR SYSTEM

Exercise 1. Key words:

verb	noun	adjective
beat	atrium, <i>pl</i> atria	forcibly
contract	bulk	rhythmic
enclose	cartilage	sinoatrial
ensure	mediastinum	ventral
initiate	nutrient	
oxygenate	resistance	
transfer	Septum, <i>pl</i> septa	
	surface	
	ventricle	

Exercise 2. Pronounce correctly and guess the meaning of the following words:

impulse [ˈɪmpʌls], endocardium [endəʊˈkɑːdiəm], pericardium [periˈkɑːdiəm], myocardium [maɪəʊˈkɑːdiəm], membranous [ˈmembɾənəs], sternum [ˈstɜːnəm], venae cavae [ˈviːnəˈkeɪvi], tricuspid [traɪˈkʌspɪd], bicuspid [baɪˈkʌspɪd], rhythmical [ˈrɪðmɪkəl], mitral [ˈmaɪtrəl], valve [vælv], semilunar [semiˈluːnə], aortic [ei ˈɔːtɪk], chamber [tʃeɪmbə]

Exercise 3. Form the adverbs from the adjectives:

adjective	adverb	adjective	adverb
slow	<i>slowly</i>	rhythmical	
special		ventral	
internal		intramuscular	
central		superficial	
large		global	
general		temporary	

forcible		continuous	
great		eventual	

Exercise 4. Open the brackets using the comparative and superlative form of the adjectives

1. The resistance to blood flow through the general circulation is ...(great) than the resistance through the lungs.
2. The human heart weights... (little) than a pound.
3. The right atrium of the heart is ... (large) than the left one.
4. The walls of the left atrium are ... (thick) than those of the right one.
5. The left ventricle is ... (long) than the right ventricle.
6. The veins are...(large) than cappillaries.
7. The ... (small) veins in the body are called venules.
8. The venules branch into... (large) veins which eventually carry the blood to the... (large)veins in the body, the vena cava.
9. The aorta is the... (large) artery which distributes the blood throughout the body.
10. He knows the structure of the heart... (good) than that of the lungs

Exercise 5. Read the text:

Anatomy of the cardio-vascular system

The cardiovascular system is also called the circulatory system. It consists of the heart, which is a muscular pump and a system of vessels such as arteries, veins, and capillaries. This system is responsible for blood transportation. The cardiovascular system moves blood throughout the body that transports oxygen and nutrients to the cells and removes carbon dioxide and other wastes from the body. The word *cardiovascular* is composed of two parts: the Greek word kardia which means "heart" and the Latin word vasculum which means "small vessel."

The heart is the muscular pump in the centre of the chest that beats continuously and rhythmically to send blood to the lungs and the rest of the body. It is located on

the diaphragm between the lower borders of the lungs, occupying the middle of the mediastinum. It is covered ventrally by the sternum and the adjoining parts from the third to the sixth costal cartilages. The weight of the heart in men is approximately 300 g and in women 260 g. Much of the heart consists of myocardium, a special type of muscle. The heart muscle is supplied with oxygen and nutrients by two coronary arteries.

The internal surface of the heart is lined with a smooth membrane, called endocardium, and the entire heart is enclosed in a tough, membranous bag, the pericardium. A thick central muscular wall, the septum, divides the heart cavity into right and left halves. Each half consists of an upper chamber, called an atrium, and a larger lower chamber, called a ventricle. The right atrium receives deoxygenated blood from the entire body via 2 large veins called the venae cavae. This blood is transferred to the right ventricle and pumped to the lungs via the pulmonary artery to be oxygenated and to lose carbon dioxide. The left atrium of the heart receives oxygenated blood from the lungs (via the pulmonary veins); this blood is transferred to the left ventricle and then pumped to all tissues in the body.

The valves of the heart include the tricuspid valve, the bicuspid (mitral) valve, the semilunar aortic valve, and the semilunar pulmonary valve. The sinoatrial node in the right atrium of the heart initiates the cardiac impulse, causing the atria to contract. These one-way valves at the exits from each chamber ensure that blood flows in only one direction. As resistance to blood flow through the general circulation is much greater than the resistance through the lungs, the left side of the heart must contract more forcibly than the right one, that's why it has greater muscular bulk.

Exercise 6. Answer the questions:

1. What does the cardiovascular system consist of?
2. What is the function of this system?
3. What does the word *cardiovascular* stand for?
4. Where is the heart located?
5. What does the septum serve for?

6. What does each half of the heart consist of?
7. What are the valves of the heart?
8. What is the function of the right atrium?
9. What is the function of the left atrium?
10. What do one-way valves at the exits from each chamber ensure?
11. Why does the left side of the heart have greater muscular bulk?

Exercise 7. Match the two columns:

1. to pump	a) to put together or make up by combining
2. to contract	b) to separate into parts
3. to oxygenate	c) to acquire or get something
4. to deoxygenate	d) to surround on all sides; close in
5. to receive	e) to enrich with oxygen
6. to transfer	f) to raise or cause to flow by means of a pump
7. to enclose	g) to make available for use; provide
8. to divide into	h) to reduce in size by drawing together; shrink
9. to supply	i) to convey or remove something from one place to another
10. to compose of	j) to deprive of oxygen

Exercise 8. Fill in the gaps using the verbs from Exercise 8:

1. A thick central muscular wall, the septum, ... the heart cavity into right and left halves.
2. Two coronary arteries ... the heart muscle with oxygen and nutrients.
3. The pulmonary veins are large blood vessels that ... oxygenated blood from the lungs to the left atrium of then heart.
4. Blood is ... in the lungs.
5. The heart is ... in the pericardium.
6. The right atrium ... the deoxygenated blood from the body via 2 veins called the venae cavae.

7. Both atria ... simultaneously, followed quickly by the simultaneous contraction of the ventricles.
8. The wall of the heart ... three layers: the epicardium, the myocardium, and the endocardium.
9. The heart is a chambered muscular organ in vertebrates that ... blood received from the veins into the arteries, and maintains the flow of blood through the entire circulatory system.
10. This blood is transferred to the right ventricle and pumped to the lungs via the pulmonary artery to be

Exercise 9. Match the terms with their definitions:

1. atrium	a) the hollow muscular organ in vertebrates whose contractions propel the blood through the circulatory system;
2. endocardium	b) a dividing partition between two tissues or cavities;
3. pericardium	c) any device that shuts off, starts, regulates, or controls the flow of fluids;
4. myocardium	d) a cavity or a chamber in the body, especially the upper chamber of each half of the heart;
5. ventricle	e) a chamber of the heart, having thick muscular walls, that receives blood from the atrium and pumps it to the arteries;
6. septum	f) the part of the thoracic cavity that lies between the lungs, containing the heart and its vessels;
7. valve	g) the membranous sac enclosing the heart. It fixes the heart to the mediastinum and gives protection against infection;
8. venae cavae	h) the membrane that lines the cavities of the heart and forms part of the valves and provides protection to the valves and heart chambers;
9. mediastinum	i) the muscle tissue of the heart, which forms a thick middle layer between the outer epicardium layer and the inner endocardium layer;
10. heart	

	j) are large veins that return deoxygenated blood from the body into the heart (the superior vena cava and the inferior vena cava) and both empty into the right atrium
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Exercise 10. Make questions to the underlined words:

1. The heart beats continuously and rhythmically to send blood to the lungs.
2. Much of the heart consists of myocardium.
3. The heart muscle is supplied with oxygen by 2 coronary arteries.
4. The right atrium receives deoxygenated blood from the entire body.
5. The left atrium of the heart receives oxygenated blood from the lungs.
6. One-way valves ensure that blood flows in only 1 direction.
7. The left side of the heart must contract more forcibly than the right one.
8. Tricuspid valve lies between the right atrium and the right ventricle.

Exercise 11. Open the brackets and translate the following sentences:

1. The blood also (to carry) nutrients from the liver to various organs of the body.
2. Heart murmurs (to be) common in young children and the elderly.
3. The earliest descriptions of the coronary and pulmonary circulation systems can (to find) in Avicenna's Canon, published in 1242.
4. The valves of the heart (to discover) by a physician of the Hippocratean school around the 4th century BC.
5. Diseases of the heart primarily (to treat) by cardiologists.
6. In humans, the heart (to divide) into four chambers.

7. The heart (to contract) at a rate of around 72 beats per minute, at rest.
8. On dissection, arteries (to be) typically empty of blood.

Exercise 13. Open the brackets:

1. The capillaries got their names (because, because of) they resemble hairs.
2. The blood reaches the arteries (because, because of) the contraction of the heart.
3. The heart pumps about five liters of blood in one minute (because, because of) it beats 60-80 times a minute and ejects about 130 cubic centimetres of blood at each beat.
4. The two blood streams do not readily mix in the ventricle (because, because of) the muscular meshwork within its cavity.
5. (Because, because of) arteries carry blood away from the heart, they must be strong enough to withstand the high pressure of the pumping action of the heart.
6. If we stimulate the nerve in the ear by electricity, the ear becomes blanched (because, because of) the arteries contract.
7. Many infectious diseases are dangerous (because, because of) it is difficult to treat them.
8. The woman's heart beats 6 or 8 times a minute faster than that of the man (because, because of) the smaller size of her heart.

Exercise 14. Complete the sentences:

1. Cardio-vascular system is ...
2. The cardio-vascular system consists of ...
3. The Central part of the cardio-vascular system ...
4. The human heart is ...
5. The weight of the heart...
6. Blood constantly moves ...
7. The heart muscle is supplied...
8. The valves of the heart include...

Exercise 15. Arrange the sentences in the correct order to explain the term

“heart”:

1. It is located on the diaphragm between the lower borders of the lungs, occupying the middle of the mediastinum.
2. The human heart provides the blood circulation through the cardiac cycle and is one of the most vital organs in the human body
3. The organ is about 12 cm long, 8 cm wide at its broadest part, and 6 cm thick, and weights from 230 to 340 g.
4. The heart is the muscular pump in the centre of the chest that beats continuously and rhythmically to send blood to the lungs and the rest of the body.
5. A thick central muscular wall, the septum, divides the heart cavity into right and left halves; each half consists of an upper chamber, called an atrium, and a larger lower chamber, called a ventricle.

Exercise 16. Speak about “atrium”, “ventricle” according to the scheme. Use example of your answer the term “heart” from ex 13:

1. definition
2. location
3. structure
4. general characteristics
5. function

Self-check

I. Answer the questions:

What does the cardiovascular system consist of?

What is the function of the cardio-vascular system system?

What does the word *cardiovascular* stand for?

Where is the heart located?

What does each half of the heart consist of?

II. Define the terms:

Heart, atrium, ventricle

PHYSIOLOGY OF THE CARDIO-VASCULAR SYSTEM

Exercise 1. Key words:

verb	noun	adjective
depend on	pump	considerable
discharge	heartbeat	circulatory
estimate	chamber	
prolong	contraction	
	exertion	
	circulation	
	rate	
	wave	

Exercise 2. Read the following paying attention to the rules of reading. Give examples of your own:

-tion – solution; production, function, examination

[ʃn]

-sion → [ʃn] – after consonants – commission, mission

[ʒn] – after after vowels – division, decision

Exercise 3. Pronounce correctly and guess the meaning of the following words:

Physiologist [ˌfɪz.i'ɒl.ə.dʒɪst] emotion [ɪ'məʊ.ʃən], cardiac ['kɑː.di.æk], cycle ['saɪkl], pressure ['preʃə(r)], measure ['meʒ.ər] possibility [ˌpɒsə'bɪləti], relaxation [ˌriː.læks'eɪ.ʃən], ventricular [ven'trɪk.jə.lər], supply [sə'plaɪ], relatively ['relətɪvli], pulmonary ['pʊl.mə.nə.ri], discharge [dɪs'tʃɑːdʒ], circulation [ˌsɜː.kjʊ'leɪ.ʃən], considerably [kən'sɪdərəbli].

Exercise 4. Form the Nouns with the help of suffix – ance (- ence) from the adjectives:

adjective	noun	adjective	noun
patient		importan	
tolerant		incident	
distant		dependent	
excellen		constant	

Exercise 5. Select one new word for each line to make the word combinations, read and notice their meanings:

Circulation, rate, exertion, considerable, total

Physical ..., mental..., considerable..., extreme..., on

Pulmonary ..., systemic ...

Heartbeat ..., pulse ..., death ..., birth ..., respiration ..., recovery ...

... attention, ... danger, ... discomfort, ... weight, ... pressure, ... effort.

... area, ... immunity, ... loss, ... size, ... duration, ... increase

Exercise 6. Read the text:

Physiology of the cardio-vascular system

The human heart contracts from the first moment of life until the last one. The contractions of the heart pump the blood through the arteries to all the parts of the body. The heart functions as a pump in the circulatory system to provide a continuous flow of blood throughout the body. This circulation consists of the systemic circulation to and from the body and the pulmonary circulation to and from the lungs. Blood in the pulmonary circulation exchanges carbon dioxide for oxygen in the lungs through the process of respiration. The systemic circulation then transports oxygen to the body and returns carbon dioxide and relatively deoxygenated blood to the heart for transfer to the lungs. Scientists have determined that the total weight of the blood pumped by the heart daily is about ten tons.

The rate of heart contractions is regulated by two groups of nerve fibers. It

varies in different persons and at different age.

Physiologists have determined that in the adult the heart makes from 60 to 72 beats per minute. In children the rate of heartbeat is much higher. Research work of many scientists has helped to determine that the rate of heartbeat increases depending on different emotions.

Each beat of the heart is followed by a period of rest for the cardiac muscle. Each wave of contraction and a period of rest following it compose a cardiac cycle. It consists of a complete series of systolic and diastolic events. One cardiac cycle causes pressure in the heart chambers to rise and fall and valves to open and close.

Research work has given physiologists the possibility to find out that the heart muscle works or contracts about one third of the time of the person's life. The period of rest is shorter during greater physical exertion and longer when the body is at rest.

Each cardiac cycle consists of three phases: physiologists have called the first phase of short contraction of both atria — the atrial systole. They have called the second phase of a more prolonged contraction of both ventricles — the ventricular systole. The period of rest of the cardiac muscle is called the diastole.

The systolic blood pressure is the first number in a blood pressure reading, measuring the strength of contraction. The diastolic blood pressure is the second number in a blood pressure reading, measuring the strength of relaxation. The right ventricle does not need to pump blood with as much force as the left ventricle. This is so because the right ventricle supplies blood to the nearby lungs and the pulmonary vessels are wide and relatively short. This means that the walls of the right ventricle are thinner and less muscular than those of the left ventricle, which must pump blood to the entire body.

The left ventricle discharges out the blood received by the left atrium from the pulmonary circulation through the aorta to the systemic circulation.

The blood received from the systemic circulation by the right atrium is discharged out of the right ventricle to the lungs through the pulmonary arteries.

Prolonged research work of many physiologists has given the possibility to

estimate the role of the ventricles which serve as the main pump. The atria act as receiving chambers. The contraction of the atria which sends the final portion of the blood into the ventricle is considerably less.

Exercise 7. Answer the questions to the text:

1. What are the heart functions as a pump in the circulatory system?
2. What is the systemic circulation?
3. How many beats per minute does the heart make?
4. What is the total weight of the blood pumped by the heart daily?
5. What is systole?
6. What is diastole?
7. How many phases does each cardiac cycle consist of?
8. What is the role of ventricles?
9. How long does the heart muscle contract?
10. What does the rate of heartbeat depend on?

Exercise 8. Complete the sentences using the information from the text:

1. The atria act as
2. Each cardiac cycle consists of ... phases.
3. In the adult the heart makes ... beats per min.
4. The total weight of the blood pumped by the heart daily is about ... tons.
5. The rate of heart contractions is regulated by
6. Each beat of the heart is followed by
7. The period of rest of the cardiac muscle is called
8. The ventricles serve as

Exercise 9. Match the terms with their definitions:

1. systemic circulation	a) the period between two contractions of the heart when the muscles of the heart relax. It is the relaxation of a heart structure.
2. pulmonary circulation	b) the period of the cardiac cycle during which the heart contracts. It is the contraction of a heart structure.
3. systole	c) the circulation of blood to and from the lungs.
4. diastole	d) it is consist of a complete series of systolic and diastolic events makes up a heartbeat.
5. cardiac cycle	e) the maximum pressuring during ventricular contraction.
6. atria	f) either of the two lower chambers of the heart. They receive blood from the atria, which they pump out into the arteries.
7. systolic pressure	j) either of the upper chambers of the heart. They receive blood returning to the heart.
8. diastolic pressure	h) the circulation of blood through the arteries, capillaries, and veins of the general system, from the left ventricle to the right atrium.
9. ventricle	i) the lowest pressure that remains in the in arteries before the next ventricular contraction.

Exercise 10. Put the phrases in the correct order to make sentences.

1. their actions/ are effective/ so that/ The heart chambers/ are coordinated.
2. two atria and two ventricles/ is divided/ The heart/ into
3. is due to/ of the cardiac muscle/ the regular and repetitive/ The pumping action of your heart/ contractions and relaxtions
4. immediately/ contract/ The heart muscles/ then
5. The contraction of the heart/ is called diastole/ is called systole,/ and its relaxation
6. of the heart/ pumps blood out/ to the rest of the body./ The left ventricle
7. is the force/ Blood pressure/ against the insides of blood vessels./ that blood exerts
8. consists of vessels/ and back to the left atrium./ The pulmonary circuit/ that carry

blood from the right ventricle to the lungs

Exercise 11. Form Participle II of the following verbs.

to ask		to write	
to examine		to produce	
to cut		to protect	
to read		to publish	
to relieve		to know	

Exercise 12. Open the brackets using the Perfect Tense:

1. You ever (be) to Germany?
2. The young scientist (publish) many article since 2000.
3. Today the surgeon (complete) the operation.
4. You (be) to the dissecting room?
5. Recently his respiratory rate (increase) considerably.
6. The patient's sleep (become) sound since he began to take this medicine.
7. The teacher (finish) to examine students this week.
8. After the patient (to take) he feels better.

Exercise 13. Open the brackets using correct tense form and voice.

1. The heartbeat (to produce) the pulsation.
2. On admission to the clinic the physician (to examine) the patient's heart.
3. The patient's blood and urine test (to make) the following day.
4. The nagging pain in the heart (to relieve) by a tablet of nitroglycerin.
5. The pain in his heart (to subside) lately.
6. The nurse (to remove) the dressing carefully.
7. Dull heart sounds (to determine) by the physician by percussion.
8. The nurse already (to give) an injection of the nicotine acid.

Exercise 14. Put questions to the underlined words:

1. The rate of heart contractions are regulated by two groups of nerve fibers.
2. Each beat of the heart is followed by a period of rest for the cardiac muscle.
3. Each cardiac cycle consists of three phases.
4. The period of rest is shorter during greater physical exertion.
5. Physiologists have called the first phase of short contraction of both atria the atrial systole.
6. The rate of the heartbeat depends on different emotions.
7. Scientists have determined that the total weight of the blood is about 10 tons.
8. Research work of many physiologists has given the possibility to estimate the role of the ventricles.

Exercise 15. Select the correct characteristics of terms from the list:

systole	diastole
<ol style="list-style-type: none"> 1. is when the heart muscle contracts. 2. is when the heart muscle relaxes. 3. is when a person's blood pressure increases. 4. When the heart contracts, it pushes the blood out of the heart and into the large blood vessels of the circulatory system. From here, the blood goes to all of the organs and tissues of the body. 5. When the heart relaxes, the chambers of the heart fill with blood, and a person's blood pressure decreases. 	

Exercise 16. Insert necessary terms:

Systole, cardiac cycle, diastole

The period of time that begins with contraction of the atria and ends with ventricular relaxation is known as the The period of contraction that the heart undergoes while it pumps blood into circulation is called The period of relaxation that occurs as the chambers fill with blood is called

Self-check

I. Answer the questions:

1. What is systole?
2. What is diastole?
3. What is the cardiac cycle composed of?
4. What is the rate of heart contractions regulated by?
5. How many beats per min does the heart make?

II. Define the terms:

Systole, diastole, cardiac cycle

BLOOD. BLOOD GROUPS AND BLOOD TRANSFUSION

Exercise 1. Key words:

verb	noun	adjective
accumulate	consequences	aqueous
accumulate	urea	lactic
agglutinate	amino acid	average
circulate	erythrocyte	compatible (with)
contain	recipient	fatal
crack	iron	essential
deliver	rhesus	dissolved
determine	platelet	
float	ratio	
increase	solution	
inherit		
reproduce		
reproduce		

transfuse		
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Exercise 2. Read correctly:

- **ous** [əs] – fibrous, nervous, numerous, venous, dangerous, infectious, continuous
- **ure** [tʃə] – moisture, future, fracture, suture, lecture, structure, furniture
- **o** [ʌ] – other, come, become, some, among, another, accompany, accomplish
- **tion** [ʃn] – aggregation, protection, secretion, absorption, connection, addition, sedimentation
- **um** [əm] – stratum, caecum, rectum, peritoneum, atrium, bacterium, medium

Exercise 3. Read the text:

Blood

Blood is a reddish bodily fluid that is pumped by the heart through the arteries and veins. **It is blood that** delivers necessary substances such as nutrients and oxygen to the body cells and transports metabolic waste products away from the cells. It is composed of blood cells floating in blood plasma. The blood cells are mainly red blood cells, white blood cells and platelets. The average person has about 5 liters of blood; it makes up 7 to 8 percent of a person's body weight.

Red blood cells (RBCs), or erythrocytes, are the most numerous cells in the blood. RBCs have no nuclei. The primary function of red blood cells is to transport oxygen from the lungs to the cells of the body. RBCs have an iron-containing protein called hemoglobin. **It is hemoglobin that** actually carries the oxygen and gives blood its red color. Besides carrying oxygen to the cells of the body, the RBCs help to remove carbon dioxide (CO₂) from the body.

White blood cells (WBCs), or leukocytes, are a part of the immune system and help human body fight infection. It is leucocytes that are transported to an area where an infection has developed. When the number of WBCs in the human blood increases, this is a sign of infection somewhere in the body.

It is thrombocytes, also called platelets, **that** are responsible for blood clotting (coagulation). Platelets are formed in the bone marrow. They do not have a nucleus

and do not reproduce.

Plasma is the blood's liquid medium. It is straw-yellow in color. It is plasma that makes 55% of blood. It is essentially an aqueous solution containing 92% water, 8% blood plasma proteins, and trace amounts of other materials. Plasma circulates dissolved nutrients, such as glucose, amino acids, and fatty acids, and removes waste products, such as carbon dioxide, urea, and lactic acid.

Medical terms related to blood often begin with *hemo-* or *hemato-* (also spelled *haemo-* and *haemato-*) from the Greek word “*haima*” for "blood".

Blood Groups and Blood Transfusions

Experiments with blood transfusions have been carried out for hundreds of years. In 1901 the Austrian scientist Karl Landsteiner discovered human blood groups and since then blood transfusions became safer. For this discovery he was awarded the Nobel Prize in Physiology.

The two main ways to classify blood groups are the ABO (A, B, AB, O) system and the Rh (Rhesus positive +, Rhesus negative -) system.

The differences in human blood are due to the presence or absence of certain protein molecules called antigens and antibodies. Antigens are located on the surface of red blood cells and antibodies are located in blood plasma.

Group A: The surface of the red blood cells contains A antigen, and the plasma has anti-B antibody. Anti-B antibody would attack blood cells that contain B antigen.

Group B: The surface of the red blood cells contains B antigen, and the plasma has anti-A antibody. Anti-A antibody would attack blood cells that contain A antigen.

Group AB: The red blood cells have both A and B antigens, but the plasma does not contain anti-A or anti-B antibodies. Individuals with type AB can receive any ABO blood type.

Group O: The plasma contains both anti-A and anti-B antibodies, but the surface of the red blood cells does not contain any A or B antigens. Since these antigens are not present, a person with any ABO blood type can receive this type of blood.

Mixing blood from two individuals can lead to blood clumping or agglutination. The clumped red cells can crack and cause toxic reactions. This can have fatal

consequences. Karl Landsteiner discovered that blood clumping was an immunological reaction which occurs when the receiver of a blood transfusion has antibodies against the donor's blood cells.

For a blood transfusion to be successful, ABO and Rh blood groups must be compatible between the donated blood and the recipient. If they are not, the red blood cells from the donated blood will clump or agglutinate. The accumulated red cells can obstruct blood vessels and stop the circulation of blood to various parts of the body.

You can give A blood to persons with blood group A, B blood to a person with blood group B and so on. But in some cases you can receive blood with another type of blood group, or donate blood to a person with another kind of blood group.

People with blood group O Rh - are called "universal donors" and people with blood group AB Rh+ are called "universal receivers."

Transfusions can spread disease from donor to recipient that is why donors should be periodically tested for infectious diseases.

Exercise 4. Answer the following questions:

1. What is blood?
2. What is blood composed of?
3. What kinds of blood cells are there?
4. How much blood does the average person have?
5. What are RBCs?
6. What are the functions of red blood cells?
7. What is hemoglobin?
8. What is the function of white blood cells?
9. What is the function of platelets?
10. What is blood plasma?
11. When did the Austrian scientist Karl Landsteiner discover human blood groups?
12. What are the two main ways to classify blood groups?
13. What are the differences in human blood due to?
14. Where are located antigens and antibodies?

- 15 What are the main characteristics of blood group **O**?
- 16 What can mixing of blood from two individuals lead to?
- 17 What people are called "universal donors" and "universal receivers"?
- 18 Why donors should be periodically tested for infectious diseases?

Exercise 5. Complete the sentences according to the text:

1. The prefix *hemo-* or *hemato-* comes from _____.
2. _____ is straw-yellow in color.
3. The function of white blood cells is _____.
4. The most numerous cells in the blood are _____.
5. The function of thrombocytes is _____.
6. _____ blood cells have no nuclei.
7. An iron-containing protein is called _____.
8. Blood is composed of the following cells: _____.

Exercise 6. Match the terms with their definitions:

1. blood	a. a blood cell that digests bacteria and fungi; an important part of the body's immune system
2. Anemia	b. any of the numerous small, round cells found in the blood that function in the clotting of blood.
3. leucocyte	c. a straw-yellow protein-containing fluid portion of the blood in which the blood cells and platelets are normally suspended.
4. Leukocytosis	d. a bodily fluid consisting of plasma, blood cells, and platelets that is circulated by the heart through the vascular system, carrying oxygen and nutrients to and waste materials away from all body tissues.
5. blood plasma	e. an iron-containing protein in red blood cells, that transports oxygen from the lungs to the tissues of the body.
6. hemoglobin	f. a blood cell that transports oxygen and carbon dioxide, combined with the red pigment hemoglobin, to and from the

	tissues.
7. platelet	g. is a condition in which the white cell (leukocyte count) is above the normal range in the blood. It is frequently a sign of an inflammatory response, most commonly the result of infection, but may also occur following certain parasitic infections or bone tumors as well as leukemia.
8. erythrocyte	h. is a decrease in the total amount of red blood cells (RBCs) or hemoglobin in the blood or a lowered ability of the blood to carry oxygen.

Exercise 7. Fill in the gaps with the missing words/word-combinations given below:

platelets; serum; hemoglobin; float; red blood cells; blood plasma; erythropoetin; carbon dioxide

1. ... are the only elements of blood capable of transporting oxygen throughout the body.
2. ... is the principal determinant of the color of blood.
3. ... contains glucose and other dissolved nutrients.
4. Without ..., you would bleed to death.
5. A hormone called ... regulates the production of erythrocytes.
6. ... enters is brought back to the lungs.
7. When plasma is allowed to clot, the fluid left behind is called
8. Erythrocytes, leucocytes and platelets ... in plasma.

Exercise 8. Match the terms with its definitions:

Hemorrhage	The protein in the red blood cells of vertebrates that carries oxygen from the lungs to tissues and that consists of four polypeptide subunits
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Hemostat	Intense bleeding; discharge of blood from blood vessels
Hemophilia	Formation of new cellular components of the blood in myeloid or lymphatic tissue.
hemoglobin	The destruction of red blood cells, and subsequent release of hemoglobin, at the normal end of the cell's life.
hemangioma	An instrument which stops hemorrhage
hemolysis	Any disorder or disease of the blood
hemopoiesis	A congenital, benign tumor of endothelial cells.
hemopathy	Bleeding which cannot be controlled

Exercise 9. Match the terms with their definitions:

1. blood transfusion	a) substance that is capable of stimulating an immune response, specifically activating lymphocytes, which are the body's infection-fighting white blood cells.
2. blood groups	b) a protective protein produced by the immune system in response to the presence of a foreign substance, called an antigen.
3. Rh system.	c) is a common procedure in which donated blood or blood components are given to you through an intravenous line
4. ABO system	d) people with type O- red blood cells. Their red blood cells can be given to any other blood type
5. universal donor	e) is used to denote the presence of one, both, or neither of the A and B antigens on erythrocytes
6. universal receiver	f) is a classification of blood, based on the presence and absence of antibodies and inherited antigenic substances on the surface of red blood cells
7. antibody	g) system for classifying blood groups according to the presence or absence of the Rh antigen
8. antigen	h) people with blood group AB Rh+

Exercise 10. Arrange the following sentences in the correct order to explain the term “blood”:

___ It delivers nutrients and oxygen to the body cells and transports metabolic waste products away from the cells.

___ The average person has about 5 liters of blood.

___ Blood is a reddish bodily fluid that is pumped by the heart through the arteries and veins.

___ The blood cells are mainly red blood cells, white blood cells and platelets.

___ It is composed of blood cells floating in blood plasma.

Exercise 11. Arrange the following sentences in the correct order to explain the term “blood groups”:

___ Mixing blood from two individuals can lead to blood clumping or agglutination.

___ The differences in human blood are due to the presence or absence of certain protein molecules called antigens and antibodies.

___ In 1901 the Austrian scientist Karl Landsteiner discovered human blood groups

___ Karl Landsteiner discovered that blood clumping was an immunological reaction which occurs when the receiver of a blood transfusion has antibodies against the donor’s blood cells.

___ The two main ways to classify blood groups are the ABO (A, B, AB, O) system and the Rh (Rhesus positive +, Rhesus negative -) system.

Exercise 12. Arrange the following sentences in the correct order to explain the term “blood transfusions”:

___ Transfusions can spread disease from donor to recipient that is why donors should be periodically tested for infectious diseases.

___ The accumulated red cells can obstruct blood vessels and stop the circulation of blood to various parts of the body.

___ For a blood transfusion to be successful, ABO and Rh blood groups must be compatible between the donated blood and the recipient.

___ People with blood group O Rh - are called "universal donors" and people with blood group AB Rh+ are called "universal receivers."

___ Mixing blood from two individuals can lead to blood clumping or agglutination.

Self-check

I. Answer the questions:

1. What is blood composed of?
2. What kinds of blood cells are there?
3. What are the functions of red blood cells?
4. What is the function of white blood cells?
5. What is the function of platelets?
6. What are the two main ways to classify blood groups?
7. Where are located antigens and antibodies?
8. What can mixing of blood from two individuals lead to?
9. What people are called "universal donors" and "universal receivers"?
10. Why donors should be periodically tested for infectious diseases?

II. Define the terms:

Blood, erythrocytes, leucocytes, thrombocytes, hemoglobin, blood plasma, blood groups, blood transfusions

ANATOMY OF THE RESPIRATORY SYSTEM

Exercise 1. Key words:

verb	noun	adjective
breathe	alveolus	respiratory
supplement	bronchus	
take place	bronchiole	
	alveolus	
	bronchus	
	bronchiole	
	carbon dioxide	
	diaphragm	
	division	
	ex-, inhalation	
	pleura	
	oxygen	
	trachea	

Exercise 2. Read the following paying attention to the rules of reading. Give examples of your own:

ch ↘ [tʃ] – each, **ch**ill, **ch**est

[k] – **ch**emistry, **ach**e, **ch**aracter, stomach – Greek origin

ture [tʃə] – suture, mixture, temperature, fracture

wh ↘ o [h] – who, whom, whose, whole

[w] – when, why, whale, white

kn [n] – knee, knuckle, knowledge, knight

Exercise 3: Pronounce correctly and guess the meaning of the following words:

Require [rɪ'kwaɪə(r)], muscle ['mʌs.l], pharynx ['fær.ɪŋks], bronchioles

[ˈbrɒŋ.ki.əʊl], external [ɪkˈstɜː.nəl], hollow [ˈhɒləʊ], moisturize [ˈmɔɪs.tʃəɪ.zər], supplement [ˈsʌp.lɪ.mənt], slightly [ˈslaɪtli], division [dɪˈvɪʒn], numerous [ˈnjuː.mə.rəs], sac [sæk], vital [ˈvaɪtəl], pleura [ˈplʊə.rə], depth [depθ], increase [ˈɪŋkriːs].

Exercise 4. Form the Nouns with the help of suffix – ance (- ence) from the verbs:

verb	noun	verb	noun
to disturb		to persist	
to assist		to inherit	
to differ		to resist	
to perform		to present	

Exercise 5. Read and guess the meaning of the following word combinations:

A constant stream of oxygen; to remove carbon dioxide; to be lined with hairs and mucus membrane; to supplement or replace the nasal cavity's functions; fine alveolar ducts; to be enclosed in a membranous sac; the total surface of capillaries; the vital capacity of the lungs; to increase the depth of respiration; mild and life-threatening forms of diseases.

Exercise 6. Read the text:

Anatomy of Respiratory System

The cells of the human body require a constant stream of oxygen to stay alive. The respiratory system provides oxygen to the body's cells by removing carbon dioxide.

There are 3 major parts of the respiratory system: the airway, the lungs, and the muscles of respiration.

The airway includes the nose, mouth, pharynx, larynx, trachea, bronchi, and bronchioles.

The nose and nasal cavity form the main external opening for the respiratory system through which air moves. The nasal cavity is a hollow space within the nose

and skull that is lined with hairs and mucus membrane which warm, moisturize, and filter air.

The mouth or the oral cavity is the secondary external opening for the respiratory tract. It can be used to supplement or replace the nasal cavity's functions when needed.

The pharynx, also known as the throat, is a muscular funnel. It extends from the nasal cavity to the larynx and esophagus.

The larynx, also known as the voice box, is a short section between the pharynx and trachea.

The trachea is a tube which extends from the base of the larynx to the lungs, where it divides into two bronchi.

The bronchi are two tubes which begin at the division of the trachea. The left bronchus is slightly longer than the right one as it passes around the heart to reach the left lung. Each bronchus leads into a lung. Inside the lungs, the bronchi divide, and subdivide, into smaller numerous bronchioles. The bronchioles end in very fine alveolar ducts leading to the alveoli.

The alveoli, or air sacs, are the ends of the air passages. Each alveolus is closely surrounded by blood capillaries. There are over 700,000,000 alveoli in the lungs. The total surface of the alveoli is about 90 sq.m (square meters).

The lungs are paired, spongy organs located in the chest. The lungs are divided into lobes - the right lung has three lobes and the smaller left lung has two lobes. Each lung is enclosed in a membranous sac, or pleura. The lungs have many capillaries with the total surface of about 80 sq.m.

It is considered that in the adult the vital capacity of the lungs is about 3-4 liters. When the depth of respiration increases the vital capacity may be 6 litres and even more.

Exercise 7. Match the terms with their definitions:

1. oral cavity	a) either of the two main branches of the trachea that lead to the lungs, where they divide into smaller branches;
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2. nose	b) a membrane that encloses each lung and lines the chest cavity;
3. trachea	c) either of the two saclike respiratory organs in the thorax of
4. larynx	humans and the higher vertebrates;
5. bronchus	d) a tube that connects the pharynx and larynx to the lungs,
6. alveolus	allowing the passage of air;
7. lung	e) the opening through which food is taken in and vocalizations
8. pleura	emerge;
	f) any of the tiny air-filled sacs arranged in clusters in the lungs, in which the exchange of oxygen and carbon dioxide takes place;
	g) a muscular and cartilaginous structure lined with mucous membrane at the upper part of the trachea in humans, in which the vocal cords are located.
	h) the specialized structure of the face that serves both as the organ of smell and as a means of bringing air into the lungs.

Exercise 8. Answer the questions:

1. What is the respiratory system responsible for?
2. What are the main parts of the respiratory system?
3. What is the nose covered with?
4. What are pharynx and larynx?
5. Which bronchus is larger and why?
6. How many alveoli are there in the lungs?
7. What are the lungs? What is their vital capacity?
8. What are the common diseases of the respiratory tract?

Exercise 9. Fill in prepositions from the box below where necessary:

With; into; in; of; through; to; out;

1. Respiration is a process which provides body oxygen for growth and other metabolic activities and removes waste products in the form carbon dioxide.

2. The lungs are the main organs involved the respiration process.
3. The alveoli are where the exchange.....oxygen and carbon dioxide occurs.
4. Air passes the lungs the nostrils and the air flows down the trachea the lungs.
5. The lungs have alveoli which are small air sacs filled tiny capillaries.
6. The respiration process is carried in two ways in living organisms: aerobic and anaerobic respiration.
7. Some the common diseases related respiration are common cold, tonsillitis and laryngitis.
8. Asthma and pneumonia are diseases associated respiration along with lung cancer.

Exercise 10. Fill in the gaps with the words and word-combinations from the box:

to take in; a stuffy nose; shortness of breath; trachea or bronchi; breathless;
to supply; stress

About Respiratory Disorders

When you're short of breath, it's hard or uncomfortable for you the oxygen your body needs. You may feel as if you're not getting enough air. Sometimes mild breathing problems are from or hard exercise. But can also be a sign of a serious disease.

Many conditions can make you feel short of breath. Lung conditions such as asthma, emphysema or pneumonia cause breathing difficulties. So can problems with your, which are part of your airway system. Heart disease can make you feel if your heart cannot pump enough blood oxygen to your body. caused by anxiety can also make it hard for you to breathe. If you often have trouble breathing, it is important to find out the cause.

Exercise 11. Arrange sentences in the correct order to explain the term “lungs”:

___ The lungs are divided into lobes - the right lung has three lobes and the smaller left lung has two lobes.

___ The lungs are the main organs involved in the process of respiration.

___ The lungs are paired, spongy organs located in the chest.

___ Each lung is enclosed in a membranous sac, or pleura.

___ Respiration is a process which provides body with oxygen for growth and other metabolic activities and removes waste products in the form of carbon dioxide.

Exercise 12. Arrange sentences in the correct order to explain the term “airways”:

___ The trachea is a tube which extends from the base of the larynx to the lungs where it divides into two bronchi.

___ Each bronchus leads into a lung where they divide and subdivide into smaller numerous bronchioles.

___ The airway includes the nasal and oral cavities, pharynx, larynx, trachea, bronchi, and bronchioles.

___ The nasal cavity is a hollow space within the nose and skull that is lined with hairs and mucus membrane which warm, moisturize, and filter air.

___ The pharynx extends from the nasal cavity to the larynx and esophagus.

___ The bronchioles end in very fine alveolar ducts leading to the alveoli.

Exercise 15. Make up interrogative sentences to the underlined words:

1. The respiratory tract is the pathway of air from the nose to the lungs.
2. The respiratory tract is divided into upper respiratory tract and lower respiratory tract.
3. In the process of breathing air enters into the nasal cavity through the nostrils.
4. Air travels through the pharynx to the larynx.
5. Larynx prevents the passage of food or drink into trachea and lungs.
6. The trachea connects the pharynx and larynx to the lungs.
7. The bronchi are two tubes which end with alveoli where process of gaseous exchange takes place.
8. The lungs are the large, spongy, paired organs which are located in the thoracic

cavity.

Exercise 16. Read the text, open the brackets in the correct tense and voice.

Tina, aged 2 years, suffers from asthma. At her first treatment she (to be) very wheezy and had been prescribed steroids, which her mother didn't want to use. Both parents (to smoke). The wheezing (to reduce) after the first treatment and has now disappeared, though there (to be) a period of mucus being produced. Her breathing has improved after 4 treatments. The steroids (to discontinue) before the first treatment. It (to be) very difficult to treat a two-year-old child who is sitting and squirming on her mother's knee. However, it (to seem) to work well despite those difficulties. Normally, the child has had asthma attacks every two weeks or so during the winter. She has had none for over two months now.

Exercise 17. Speak on the following topics:

1. Famous scientists with asthma.
2. Air pollution affecting our health.
3. Oxygen cocktail as a tonic used for therapeutic and prophylactic purposes.

Self-check

I. Answer the questions:

What are the main parts of the respiratory system?

What process takes place in the lungs?

Why is the left lung smaller than the right one?

What is the respiratory system responsible for?

What are the lungs? What is their vital capacity?

II. Describe the terms:

Lungs, airways

PHYSIOLOGY OF THE RESPIRATORY SYSTEM

Exercise 1. Key words:

verb	noun	adjective
bond	breath	metabolic
capture	cilium	foreign
coat (with)	cough	vital
dissolve	germ	
emit	pollutant	
expel		
sneeze		
supply		
swallow		

Exercise 2. Read the following examples and pay attention to the rules of reading.

Give examples of your own:

g ↗ e, i, y [dz] – gel, gene, general, oxygen, age
 ↘ [g] – go, glad, again, gas, groin

ph [f] – phase, pharmacy, physics, photo, philosopher, pharynx

c ↗ e, i, y [s] – face, cyst, cytoplasm, cycle, cell
 ↘ [k] – carbon, calendar, cube, core, mucus

a + lf [a:] – calf, palm, half, calm

Exercise 3. Form the Nouns with the help of suffix – ment from the verbs:

verb	noun	verb	noun
to develop		to advance	

to treat		to achieve	
to improve		to excite	
to nourish		to judge	

Exercise 4. In Column A there are nouns relating to medicine. Find the correct plural form from Column B or Column C.

Column A (singular)	Column B (plural)	Column C (plural)
bacterium	<u><i>bacteria</i></u>	bacteriums
cilium	ciliumea	cilia
alveolus	alveoli	alveolei
trachea	trachei	tracheae
bronchus	bronchi	broncheae
bronchiole	bronchia	bronchioles
fungus	fungi	funguses
diagnosis	diagnosises	diagnoses
atrium	atriums	atria
vertebra	vertebrae	vertebras

Exercise 5. Read the text:

Physiology of Respiratory System

The respiratory system is responsible for supplying our body with oxygen. It does this by enriching blood with oxygen every time we take a breath. It also removes carbon dioxide, which is a waste gas harmful for our bodies.

We breathe oxygen through the mouth or nose, which warm up the gas and moisten it before it enters the rest of the body. The oxygen then travels through the larynx (voice box) and down the trachea (windpipe) into two bronchi, which are branch-like tissues that enter the lungs. Cilia, which are very fine hairs, grow in the larynx, trachea and bronchi. These hairs are coated with mucus that captures any germs and pollutants that are in the air we breathe before it enters the lungs. This

foreign matter is then expelled from the body through swallowing, coughing or sneezing.

Once oxygen enters the lungs, it's sent to the rest of the body's organs and tissues through a network of blood vessels. These blood vessels also capture carbon dioxide emitted by the tissues as a metabolic waste.

Blood is delivered around the body through a network of arteries, veins and blood vessels. The pulmonary artery delivers oxygen and removes carbon dioxide. It sends blood containing carbon dioxide to the alveoli, which expel the gas through exhalation. The alveoli replace the carbon dioxide with oxygen through inhalation. This oxygen-rich blood then travels to the heart, which pumps it to the rest of the body. The 2 major respiratory gases, oxygen and carbon dioxide, are transported through the body in the blood. Blood plasma has the ability to transport some dissolved oxygen and carbon dioxide, but most of the gases transported in the blood are bonded to transport molecules. Hemoglobin is an important transport molecule found in red blood cells that carries almost 99% of the oxygen in the blood.

When one breathes normally not all the alveoli and capillaries of the lungs are opened. When respiration becomes deep, the number of the opened alveoli and capillaries increases. The flow of blood into the lungs increases when one breathes in and it decreases when one breathes out.

Exercise 6. Answer the questions:

1. What is the respiratory system responsible for?
2. What is carbon dioxide?
3. What is the function of the nose?
4. What is the nasal cavity covered with?
5. What do the cilia do?
6. How do people expel foreign matters from the respiratory tract?
7. What is the process of enriching all parts of the body with oxygen?
8. What is the main molecule responsible for transportation of oxygen throughout the body?

9. When does the number of opened alveoli increase and decrease?

Exercise 7. Make the word-combinations:

1. to remove	1. a waste gas harmful for the body
2. to supply	2. foreign matters
3. to expel	3. body with the vital gas
4. to coat	4. with mucus
5. to breathe	5 pollutants through sneezing
6. to breathe out	6. to iron containing molecule
7. to capture	7. in pure oxygen
8. to bond	8. germs

Exercise 8. Match the terms with their definitions:

1. germ	a) the straw-colored liquid component of blood which makes up about 55% of the total blood volume;
2. cilium	b) a substance that pollutes, especially a chemical or similar substance that is produced as a waste product of an industrial process;
3. pulmonary artery	c) the system by which oxygen is taken into the body and where an exchange of oxygen and carbon dioxide takes place;
4. hemoglobin	in mammals the system includes the nasal passages, pharynx, trachea, bronchi, and lungs;
5. plasma	d) a microscopic hairline process extending from the surface of a cell or unicellular organism;
6. pollutant	e) the oxygen-carrying pigment of red blood cells that gives them their red color and serves to convey oxygen to the tissues;
7. respiratory system	f) a very small living thing that causes a disease;
	g) an artery that carries deoxygenated blood from the heart to

the lungs.

Exercise 9. Fill in prepositions from the box below where necessary:

through; to; as; in; for; with; from; into

1. humans the compound used to transport oxygen is known hemoglobin.
2. Hemoglobin is an iron-containing protein red blood cells that is responsible transporting oxygen the tissues and removing carbon dioxide them.
3. the lungs, hemoglobin, known for its deep red color, reacts oxygen to form oxyhemoglobin.
4. Oxyhemoglobin travels the bloodstream to cells, where it breaks down to form hemoglobin and oxygen, and the oxygen then passes into cells.
5. On the way back, hemoglobin combines carbon dioxide to form carbaminohemoglobin, an unstable compound that, once again, breaks down and releases the surrounding environment.

Exercise 10. Fill in the gaps with the words and word-combinations from the box:

store; CO₂; less than three minutes; for a long time; longer tolerance; one minute's duration; nine minutes; 214 meters

Mechanism of respiration

Under normal conditions, humans cannot much oxygen in the body. Apnea of more than leads to severe lack of oxygen in the blood circulation. Permanent brain damage can occur after and death will ensue after a few more minutes unless ventilation is restored.

Untrained humans cannot sustain voluntary apnea for more than one or two minutes. The reason for this is that the rate of breathing and the volume of each breath are tightly regulated to maintain constant values of CO₂ tension and pH of the blood. In apnea, is not removed through the lungs and accumulates in the blood.

When a person is immersed in water, physiological changes due to the mammalian diving reflex enable somewhat of apnea even in untrained persons. Tolerance can be trained. World-class divers can hold their breath underwater up to depths of and for more than Apneists, in this context, are people who can hold their breath for a long time.

Exercise 11. Approve or contradict the following statements:

1. The respiratory system is responsible for supplying our body with oxygen and it also removes carbon dioxide, which is a waste gas useful for our bodies.
2. Our nose warms, moisturizes, and filters air we breathe in.
3. All foreign matters are expelled from the body through swallowing, talking or sneezing.
4. Blood vessels release carbon dioxide emitted by the tissues as a metabolic waste.
5. The coronary artery delivers oxygen and removes carbon dioxide.
6. Deoxygenated blood travels to the heart, which pumps it to the rest of the body.
7. When respiration becomes deep, the number of the closed alveoli and capillaries increases.

Exercise 12. Arrange the following statements in the correct order to explain the term “respiration”:

___ Respiration takes place in the lungs.

___ Respiratory system is a biological system consisting of specific organs and structures used for the process of respiration.

___ The anatomical structures of the respiratory system include trachea, bronchi, bronchioles, lungs, and diaphragm.

___ This system is involved in the intake and exchange of oxygen and carbon dioxide between an organism and the environment.

___ Molecules of oxygen and carbon dioxide are exchanged by diffusion. This exchange process occurs in the alveoli air sacs in the lungs.

Exercise 13. Arrange the following statements in the correct order to explain the term “alveolus”:

- ___ Found in the lung parenchyma, alveoli are the ends of the respiratory tree.
- ___ A typical pair of human lungs contains about 700 million alveoli.
- ___ Alveoli are the place of gaseous exchange.
- ___ Each alveolus is closely surrounded by capillaries.
- ___ An alveolus is an anatomical structure of the respiratory system that has the form of a hollow cavity.

Exercise 14. Arrange the following statements in the correct order to explain the term “carbon dioxide”:

- ___ It is produced as a waste product of respiration of all aerobic organisms.
- ___ In humans carbon dioxide is carried through the venous system and is breathed out through the lungs.
- ___ Hemoglobin, the main oxygen-carrying molecule in red blood cells, carries both oxygen and carbon dioxide.
- ___ Carbon dioxide is a colorless, odorless gas vital to life on Earth.
- ___ Human body produces approximately 1.0 kg of carbon dioxide per day, containing 300 g of carbon.

Exercise 15. Read the sentences and open the brackets in the correct tense and voice. Translate them into your native language:

1. The treatment, the patient (to begin) two weeks before, is quite ineffective.
2. The condition of the patient we are treating already (to become) better.
3. The scientist already (to include) the method of determining the origin of the pulmonary disease in his research.
4. The faculty where my brother studies (to train) pediatricians.
5. Patient Kirichenko (to bring) the findings of his blood analysis in 1 hour.
6. My brother (to prepare) for the exams now.
7. The pulmonary artery (to deliver) oxygen and (to remove) carbon dioxide.

8. Foreign matters (to expel) from the body through swallowing, coughing or sneezing.

Exercise 16. Make up interrogative sentences to the underlined words:

1. The right lung consists of three lobes.
2. Each lung is enclosed in a membranous sac, or pleura.
3. Oxygen and carbon dioxide are transported through the body in the blood.
4. Blood plasma has the ability to transport dissolved oxygen and carbon dioxide.
5. When respiration becomes deep the number of closed alveoli and capillaries increases.
6. Students will be delivered a lecture on physiology of respiration in 2 days.
7. Cilia grow in the larynx, trachea and bronchi.
8. The oxygen travels through the larynx and down the trachea into two bronchi.

Self-check

I. Answer the questions:

What is the respiratory system responsible for?

What is the function of the nose?

How do people expel foreign matters from the respiratory tract?

What do cilia do?

What is hemoglobin?

II. Define the terms:

Respiration, alveolus, carbon dioxide

ANATOMY OF THE NERVOUS SYSTEM

Exercise 1. Key words:

verb	noun	adjective
evaluate	brainstem	convoluted
	cerebrum	delicate
	cerebellum	frontal
	communication	occipital
	decision	parietal
	fiber	temporal
	forebrain	
	matter	
	medulla oblongata	
	neuron	
	processing	
	Sensory organs	

Exercise 2. Pronounce correctly:

Peripheral [pə'rif(ə)rəl], nerve ['nɜ:v], nervous ['nɜ:vəs], receptor [ri'septə], integration ['intə'greiʃən], signal ['sign(ə)l], motor ['mo:tə].

Exercise 3. Select one new word for each line to make the word combinations, read and notice their meanings:

Sensory, matter, nervous

the ... system, ... stimulation, ... impulses, ... activities, ... laughter, central ... system depressants;

...organs, ... receptors, ... nerves, ... neurons, ... stimulation, ... function;

the white ... of the brain, the grey... of the brain; subject ..., spirit and .., no

Exercise 4. Some of the following words don't form adjectives with the help of suffixes. Try to form adjectives from the given nouns:

E.g. lung - pulmonary

mouth -	membrane -	tongue -
liver -	stomach -	brain -
kidney -	tooth -	skull -
liver -	heart -	vessel -
nose -		

Exercise 5. Read the text:

Anatomy of the nervous system

The nervous system consists of the brain, spinal cord, sensory organs, and all of the nerves that connect these organs with the rest of the body. These organs are responsible for the control of the body and communication among its parts.

The brain is a soft convoluted mass of nervous tissue within the skull that is the controlling and coordinating centre of the nervous system and the seat of thought, memory and emotion. The brain is also known as encephalon. It includes the cerebrum, the brainstem, the cerebellum and the cerebral cortex.

The cerebrum denotes the right and left brain hemispheres. Each hemisphere contains four lobes (frontal, temporal, occipital, and parietal) that are responsible for memory, vision, hearing, and speaking. The brainstem is connected to the spinal cord at the back of the brain. The cerebellum means "*little brain*" in Latin, and it controls motor activity and helps a person maintain posture and balance. The cerebral cortex is tissue that covers the cerebrum and is responsible for intellectual brain functions such as thinking, planning and overall behavior.

Approximately 100 billion neurons of the brain form the main control center of the body. Neurons are also known as nerve cells. Each cell is connected to the other by nerve fibers. Numerous investigations have shown that nerve cells are the most delicate cells of the human body.

The spinal cord is a long, thin mass of neurons that carries information through the vertebral cavity of the spine. It contains the white and grey matter.

The brain and the spinal cord form the control center known as the central nervous system (CNS), where information is evaluated and decisions are made.

The sensory nerves and sense organs of the peripheral nervous system (PNS) monitor conditions inside and outside of the body and send this information to the CNS.

Nerves carry signals between the brain and spinal cord, and the whole body.

The nervous system has 3 main functions: sensory, integration, and motor.

The sensory function involves collecting information from sensory receptors.

Integration is the processing of many sensory signals that takes place in the grey matter of the brain and spinal cord.

Motor function is the transmission of signals from the grey matter of the CNS through the nerves of the peripheral nervous system and move a part of the body to respond to the stimulus.

Exercise 6. Answer the questions:

1. What parts is the nervous system composed of?
2. What does the brain consist of?
3. What does the abbreviation CNS mean?
4. What organs does CNS consist of?
5. Which part of the nervous system do the sensory nerves and sense organs compose?
6. How are nervous cells called?
7. What is the spinal cord?
8. What is the function of the nerves?
9. What are the functions of the nervous system?

Exercise 7. Match the words to their definitions:

1. brain	a) a bundle of fibers that uses electrical and chemical signals to transmit sensory and motor information from one body part to another
2. spinal cord	b) specialized neurons or nerve endings that respond to changes in the environment
3. neuron	c) a part of the brain located in the posterior cranial fossa

4. brainstem	behind the brainstem.
5. sensory receptor	d) the stemlike part of the brain that connects the cerebral hemispheres with the spinal cord. e) a nerve cell that receives and sends electrical signals over long distances within the body
6. cerebrum	f) the portion of the central nervous system that is located within the skull. It functions as a primary receiver, organizer, and distributor of information for the body.
7. cerebellum	g) it is the largest part of the brain that constitutes the forebrain and is located on top of the brainstem and is considered the most developed part of the brain.
8. nerve	h) It is a long, thin, tubular bundle of nervous tissue that extends from the medulla oblongata in the brainstem to the lumbar region of the vertebral column.

Exercise 8. What organs and parts of the body do the adjectives below refer to?

Make up sentences with them on your own:

Model: cardiac – heart.

The heart pumps blood through the vessels.

- | | | |
|------------|------------|-------------|
| Cranial – | Spinal – | Vertebral – |
| Cervical – | Thoracic – | Nervous – |
| Facial – | Costal – | Oral – |
| Vascular – | | |

Exercise 9. Choose the proper word from the given below to complete the sentences:

Sensory, sympathetic, autonomic, receptor, reflex, neurons, cranial, central, grey matter, ganglion.

1. The brain and the spinal cord form the ... nervous system.

2. The nerves which connect the brain and structures of the head are
3. An immediate response of the body to a stimulus is a ... action.
4. A stimulus is received by a
5. Nerve cells are known as
6. Normally nerve cells are divided into motor, autonomous and
7. In the spinal cord, neuronal cell bodies are known as
8. A collection of neuronal cell bodies lying outside the CNS is called
9. The internal environment of the body is controlled by the ... nervous system.
10. Nerves which supply the body wall, skeletal muscle and skin are ... nerves.

Exercise 11. Use the modal verbs «can», «may» or «must». Explain their usage:

1. In vertebrates the nervous system ...contain two main parts, the central nervous system and the peripheral nervous system.
2. The PNS consists mainly of nerves that ... connect the CNS to every part of the body.
3. Malfunction of the nervous system ... be as a result of genetic defects, physical damage, and infection or simply of ageing.
4. The CNS ... consist of the brain and spinal cord.
5. In the peripheral nervous system, the most common problem is the failure of nerve conduction, which ... occur due to diabetic neuropathy.
6. Nerves that ... transmit signals from the brain are called motor or efferent nerves, while those nerves that ... transmit information from the body to the CNS are called sensory or afferent.

Exercise 12. Put questions to the underlined words:

1. Neurons communicate within the body by transmitting electrochemical signals.
2. Vital functions are controlled by the brain.
3. Movement of the body is due to nerve stimuli.
4. The spinal cord is enclosed in the vertebral column.
5. There are 12 pairs of cranial nerves.

6. The peripheral nervous system includes all of the parts of the nervous system outside of the brain and spinal cord.
7. Galen saw the spinal cord as an extension of the brain.
8. The term ‘neurology’ was coined in 1681.

Exercise 13. Open the brackets in the correct tense and form:

1. The Greek philosopher Aristotle (to believe) that the nerves were controlled by the heart.
2. The central nervous system (to include) the brain and the spinal cord.
3. The Roman physician Galen (to contradict) Aristotle and (to conclude) that the brain was the most important organ of the body.
4. Recently the scientists (to find) that nervous cells can restore.
5. The peripheral nervous system (to make up) of the somatic and autonomic nervous systems.
6. I think we (to finish) our experiments with sensory receptors next week.
7. If they (to come) tomorrow I’ll explain them the principles of the nervous activities.
8. He just (to phone) his psychotherapist.

Exercise 14. Guess which term is described:

1. It consists of the brain, spinal cord, sensory organs, and all of the nerves that connect these organs with the rest of the body.
2. It is a soft, wrinkled organ located inside the cranial cavity.
3. It contains the white and grey matter.
4. It consists of the somatic and the autonomic nervous systems.
5. It is the basic unit in the nervous system, a specialized conductor cell that receives and transmits electrochemical nerve impulses.
6. It is a nerve cell cluster located in the peripheral nervous system.

Exercise 15. Read the following information, get ready to define terms “neuron”, “nervous system”.

1. A neuron is a nerve cell that is the basic building block of the nervous system. Neurons are similar to other cells in the human body in a number of ways, but there is one key difference between neurons and other cells. Neurons are specialized to transmit information throughout the body.

These highly specialized nerve cells are responsible for communicating information in both chemical and electrical forms. There are also several different types of neurons responsible for different tasks in the human body.

Sensory neurons carry information from the sensory receptor cells throughout the body to the brain. Motor neurons transmit information from the brain to the muscles of the body. Interneurons are responsible for communicating information between different neurons in the body.

2. The nervous system consists of the brain, spinal cord, sensory organs, and all of the nerves that connect these organs with the rest of the body. Together, these organs are responsible for the control of the body and communication among its parts. The brain and spinal cord form the control center known as the central nervous system, where information is evaluated and decisions made. The sensory nerves and sense organs of the peripheral nervous system (PNS) monitor conditions inside and outside of the body and send this information to the CNS. Efferent nerves in the PNS carry signals from the control center to the muscles, glands, and organs to regulate their functions.

Self-check

I. Answer the questions:

What parts is the nervous system composed of?

What does the brain consist of?

What organs does CNS consist of?

What are the functions of the nervous system?

How are nervous cells called?

II. Define the terms:

nervous system, neuron, CNS, brain, spinal cord

PHYSIOLOGY OF THE NERVOUS SYSTEM. REFLEXES

Exercise 1. Key words:

verb	noun	adjective
arise	conjunctiva	afferent
excite	consciousness	efferent
experience	cornea	inborn
induce	detecting	instantaneous
integrate	effector	intergrative
mediate	effector	involuntary
	extension	inward
	extensor	outward
	flexor	patellar
	glare	plantar
	integration	pupillary
	quadriceps	somatic
	reflex	tranquil
	response	upward
	sensation	visceral
	stimulus <i>pl</i> stimuli	

Exercise 2. Pronounce correctly and guess the meaning of the following words:

Environment [ɪn'vaɪrənm(ə)nt], decision [dɪ'sɪʒ(ə)n], stimuli ['stɪmjələ], integration [ɪntɪ'greɪʃ(ə)n], response [rɪ'spɒns], sensation [sen'seɪʃ(ə)n], division [dɪ'vɪʒ(ə)n], visceral ['vɪs(ə)r(ə)l], afferent ['æfərənt], effector [ɪ'fektə], conscious ['kɒnʃəs]

Exercise 3. Read the text:

Physiology of the nervous system

The nervous system can also be divided on the basis of its functions. The

nervous system is involved in receiving information about the environment around us (sensory functions, **sensation**) and generating responses to that information (motor functions, **responses**) and coordinating the two (**integration**).

Sensation. Sensation refers to receiving information about the environment, either what is happening outside or inside the body. These sensations are known as **stimuli** and different sensory receptors are responsible for detecting different stimuli. Sensory information travels towards the CNS through the PNS nerves in the specific division known as the **afferent** (sensory) branch of the PNS. When information arises from sensory receptors in the skin, skeletal muscles, or joints this is known as **somatic sensory** information; when information arises from sensory receptors in the blood vessels or internal organs, this is known as **visceral sensory** information.

Response. The nervous system produces a response in **effector organs** due to the sensory stimuli. The motor (**efferent**) branch of the PNS carries signals away from the CNS to the effector organs. When the effector organ is a skeletal muscle, the information is called **somatic motor**; when the effector organ is cardiac or smooth muscle or glandular tissue, the information is called **visceral (autonomic) motor**. Voluntary responses are governed by the somatic nervous system and involuntary responses are governed by the autonomic nervous system.

The somatic nervous system (SNS) is responsible for conscious perception and voluntary motor responses. Voluntary motor response means the contraction of skeletal muscle, but those contractions are not always voluntary in the sense that you have to want to perform them. Some somatic motor responses are reflexes, and often happen without a conscious decision to perform them.

The autonomic nervous system (ANS) is responsible for involuntary control of the body, usually for the sake of homeostasis (regulation of the internal environment). Sensory input for autonomic functions can be from sensory structures tuned to external or internal environmental stimuli. The motor output extends to smooth and

cardiac muscle as well as glandular tissue. The role of the autonomic system is to regulate the organ systems of the body, which usually means to control homeostasis.

The sympathetic nervous system is involved in the stimulation of activities that prepare the body for action, such as increasing the heart rate, increasing the release of sugar from the liver into the blood, and other activities generally considered as fight-or-flight responses (responses that serve to fight off or retreat from danger).

The parasympathetic nervous system activates tranquil functions, such as stimulating the secretion of saliva or digestive enzymes into the stomach and small intestine.

Integration. Stimuli that are received by sensory structures are communicated to the nervous system where that information is processed. This is called integration. Stimuli are compared with, or integrated with, other stimuli, memories of previous stimuli, or the state of a person at a particular time. This leads to the specific response that will be generated.

Reflexes

In biology, a reflex is an automatic and often inborn response to a stimulus that typically involves a nerve impulse passing inward from a receptor to the spinal cord and then passing outward from the spinal cord to an effector (such as a muscle or gland) without reaching the level of consciousness and often without passing to the brain.

All reflexes are divided into unconditioned and conditioned ones.

An *unconditioned* reflex is a normal, instinctive, unlearned reaction to a stimulus that occurs naturally and is not dependent on previous experience. Unconditioned reflexes are also called inborn reflexes.

There are a lot of unconditioned reflexes, such as patellar, plantar, pupillary, lacrimal reflexes and many others, but the simplest ones include *swallowing, salivation, sweating, sneezing, yawning, blinking, scratching, sucking (in infants), and others.*

Probably the best-known reflex is the pupillary light reflex. If a light is flashed near one eye, the pupils of both eyes contract. Greater intensity light causes the pupil to become smaller, whereas lower intensity light causes the pupil to become larger.

A *conditioned* reflex is an action or feeling that you learn to do in response to a specific situation or stimulus. The response is occasioned by a secondary stimulus repeatedly associated with the primary stimulus.

Speaking, reading, writing, walking, running, typewriting, playing different musical instruments, cycling, driving are examples of conditioned reflexes.

Conditioned reflexes are also called acquired reflexes or trained reflexes and behavior reflexes.

Unlike conditioned reflexes, the unconditioned reflexes are mostly stable. The conditioned reflexes are not only unstable but can be modified.

Exercise 4. Answer the questions:

1. What are the primary functions of the nervous system, and how can it be categorized based on these functions?
2. Define sensation in the context of the nervous system and provide examples of sensory stimuli.
3. Differentiate between somatic sensory and visceral sensory information.
4. What is the role of the afferent branch of the peripheral nervous system (PNS)?
5. Explain the concept of responses in the nervous system and how they are generated.
6. Describe the efferent branch of the PNS and its role in carrying signals.
7. How are somatic motor and visceral motor responses distinguished?
8. What is the difference between voluntary and involuntary responses, and which nervous system governs each?
9. Elaborate on the responsibilities of the somatic nervous system (SNS) within the body.
10. How does the autonomic nervous system (ANS) contribute to maintaining homeostasis?
11. Provide examples of sensory input that trigger autonomic functions.

12. Discuss the role of the sympathetic nervous system in preparing the body for action.
13. Explain the functions of the parasympathetic nervous system and the activities it stimulates.
14. Define integration in the context of the nervous system and its significance.
15. What distinguishes unconditioned reflexes from conditioned reflexes, and can you provide examples of each?

Exercise 5. Match terms with definitions

1. central nervous system	a) the section of the nervous system responsible for sensation and control of the skeletal muscles
2. peripheral nervous system	b) the part of the autonomic nervous system that tends to act in opposition to the sympathetic nervous system, as by slowing down the heartbeat and dilating the blood vessels.
3. somatic nervous system	It regulates the function of many glands, such as those that produce tears and saliva, and stimulates motility and secretions of the digestive system
4. autonomic nervous system	c) the section of the nervous system that controls the involuntary actions of the smooth muscles, heart, and glands. It has two divisions: the sympathetic and the parasympathetic
5. sympathetic nervous system	d) the portion of the nervous system consisting of the brain and spinal cord
6. parasympathetic nervous system	e) the section of the nervous system lying outside the brain and spinal cord
	h) the part of the autonomic nervous system that tends to act in opposition to the parasympathetic nervous system, as by speeding up the heartbeat and causing contraction of the blood vessels

Exercise 6. Say for which reflexes the following statements are true:

Model: they are also called acquired reflexes – conditioned reflexes

- 1) they are learned through training;
- 2) they are also called inborn reflexes;
- 3) they are not dependent on previous experience;
- 4) they are a function of the cerebral cortex;
- 5) the foundation for the rest of the nervous activity of the body;
- 6) they are also called behavior reflexes;
- 7) they can be modified;
- 8) they are unstable;
- 9) they are a function of the subcortical nuclei, brain stem, and spinal cord;
- 10) they are unlearned reactions

Exercise 7. Match the names of unconditioned responses to their definitions:

1. swallowing	a) the common motor response to itching;
2. salivation	b) a reflex act of a sudden violent spasmodic expiration of breath through the nose and mouth following irritation of the nasal mucous membrane;
3. blinking	c) the process that usually involves the movement of food from the mouth to the stomach via the esophagus;
4. scratching	d) secretion or production of saliva;
5. sucking	e) an involuntary act, or reflex action, usually associated with drowsiness or boredom when the mouth is opened wide and a slow, deep breath is taken through it;
6. sneezing	f) movements of an infant's lips elicited by touching them or the adjacent skin;
7. yawning	g) a reflex that closes and opens the eyes rapidly.

Exercise 8. Choose the antonyms:

inside	efferent
peripheral	to decrease
continuous	safety
conscious	intermittent
afferent	unconscious
major	central
separate	simple
external	internal
complex	outside
to increase	to inhibit
danger	minor
involuntary	connected
to stimulate	voluntary

Exercise 9. Choose the proper word from the given below to complete the sentences:

complex, information, ability, sympathetic nerves, spinal , signals, balance, protective structures

1. The nervous system is the most ... of all human body systems.
2. The nervous system provides us the... to perceive, understand and react to environmental events.
3. The nervous system is responsible for rapid conduction of ... throughout the body.
4. The CNS, housed entirely within the ... of the skull and vertebral column, consists of the brain and spinal cord.
5. Information flows to the central nervous system from the peripheral nervou, which senses... from the internal environment (autonomic nervous system).
6. Each ... nerve is attached to the spinal cord by a sensory and a motor root.
7. The ... increase heart rate and forcefulness, dilate airways so more oxyge can enter, increase blood pressure, and inhibit intestinal contractions so that digestion is slower.

8. The parasympathetic nerves normally act... as for the sympathetic nerves.

Exercise 10. Complete the sentences:

1. The nervous system can also be divided on the basis of its functions: 1)... 2)... 3)....
2. ... refers to receiving information about the environment, either what is happening outside or inside the body.
3. Some somatic motor responses are ..., and often happen without a conscious decision to perform them.
4. The autonomic nervous system is divided into...
5. The nervous system produces ... in **effector organs** due to the sensory stimuli....
6. ... nervous system is involved in the stimulation of activities that prepare the body for action
7. The parasympathetic nervous system activates ..., such as stimulating the secretion of saliva or digestive enzymes into the stomach and small intestine.
8. Stimuli that are received by sensory structures are communicated to the nervous system where that information is processed. This is called

Self-check

I. Answer the questions:

1. What are the primary functions of the nervous system, and how can it be categorized based on these functions?
2. Define sensation in the context of the nervous system and provide examples of sensory stimuli.
3. Differentiate between somatic sensory and visceral sensory information.
4. What is the role of the afferent branch of the peripheral nervous system (PNS)?
5. Explain the concept of responses in the nervous system and how they are generated.
6. Describe the efferent branch of the PNS and its role in carrying signals.

7. How are somatic motor and visceral motor responses distinguished?
8. What is the difference between voluntary and involuntary responses, and which nervous system governs each?
9. Elaborate on the responsibilities of the somatic nervous system (SNS) within the body.
10. How does the autonomic nervous system (ANS) contribute to maintaining homeostasis?

II. Define the terms:

Somatic nervous system, autonomic nervous system, reflexes, conditioned reflexes, unconditioned reflexes

ANATOMY OF THE ALIMENTARY TRACT

Exercise 1. Key words:

Verb	Noun	adjective
absorb	caecum	dilated
compose	colon	hollow
extend	decomposition	indigestible
release	duodenum	salivary
remain	ileum	
	jejunum	
	length	
	pancreas	
	rectum	

Exercise 2. Form words with negative meaning with the help of prefixes:

de-: composition, toxification, hydration, dentition, compensation, fibrillation

dis-: order, location, placement, integration, colouration, section, comfort

mal-: position, nutrition, formation, occlusion, function, treatment, adjustment

anti-: body, septic, viral, bacterial, convulsant, inflammatory, pyretic, pruritic, fungal, coagulant

Exercise 3. Match the words from column A and column B to make word combinations:

A	B
Decomposition of	cream
defibrillation of	discomfort
Malposition of	Body tissue
Antipyretic	Red blood cells
malfunction	proteins
Dislocation of	the heart
disintegration of	drugs
Dissection of	the mandible
gastrointestinal	the thyroid gland
antipruritic	teeth

Exercise 4. Put words in the appropriate column:

Ileum, heart, vessel, anus, jejunum, artery, duodenum, tongue, vein, pharynx, stomach, capillary, esophagus, intestine, aorta, atria, rectum, oral cavity, salivary glands, mouth, chamber, caecum, colon, teeth, ventricle, vena cava.

Parts of the cardiovascular system	Parts of the alimentary tract
---	--------------------------------------

Exercise 5. Read the text:

Anatomy of Alimentary Tract

The alimentary tract is a musculomembraneous canal about 8½ metres in length. It extends from the oral cavity to the anus. It consists of the mouth, pharynx,

esophagus, stomach, small intestine, and large intestine. The liver with gallbladder and pancreas are the large glands of the alimentary tract.

The first division of the alimentary tract is formed by the mouth. Important structures of the mouth are the teeth and the tongue, which is the organ of taste. The soft and hard palates and the salivary glands are also in the oral cavity.

From the mouth food passes through the pharynx to the esophagus and then to the stomach.

The stomach is a muscular, hollow, dilated portion of the alimentary canal. It is in the upper part of the abdomen under the diaphragm. It measures about 21-25 cm in length, 8-9 cm in its greatest diameter. It has a capacity of from 2.14 to 4.28 litres.

The small intestine is a thin-walled muscular tube about 6.5 metres long. It is located in the middle portion of the abdominal cavity. The small intestine is composed of the duodenum, jejunum and ileum.

The large intestine is the last part of the alimentary tract. Its function is to absorb water from the remaining indigestible food matter, and then to pass useless waste material from the body. It is about 1.5 metres long. It is divided into caecum, colon and rectum.

The liver is the largest gland in the human body. It is in the right upper part of the abdominal cavity under the diaphragm. The weight of the liver is 1,500 g. This organ plays a major role in metabolism and has a number of functions in the body, including glycogen storage, decomposition of red blood cells, plasma protein synthesis, hormone production, and detoxification.

The gallbladder is a hollow pear-shaped sac lying on the lower surface of the liver. It receives and stores bile, produced by the liver, via the common hepatic duct, and releases it via the common bile duct into the duodenum, where the bile helps in the digestion of fats.

The pancreas is a long thin gland lying behind the stomach.

Exercise 6. Answer the questions to the text:

1. What is the alimentary tract?

2. What does the alimentary tract consist of?
3. What is the 1st division of the alimentary tract formed by?
4. What is the stomach?
5. What is the small intestine?
6. What is the function of the large intestine?
7. What largest glands in the human body do you know?
8. What is the function of the gallbladder?

Exercise 7. Match the terms with their definitions:

1. alimentary tract	a) the passage between the pharynx and the stomach;
2. stomach	b) the passage to the stomach and lungs; located in the front part of the neck below the chin and above the collarbone;
3. pharynx	c) beginning with the caecum and ending with the rectum; includes the caecum and the colon and the rectum; extracts moisture from food residues which are later excreted as feces;
4. small intestine	d) the tubular passage extending from the mouth to the anus, through which food is passed and digested;
5. large intestine	e) the longest part of the alimentary canal; where digestion is completed;
6. esophagus	f) an enlarged and muscular saclike organ of the alimentary canal; the principal organ of digestion.

Exercise 8. Write down organs in their appropriate position:

	<p>Stomach caecum colon appendix liver teeth esophagus rectum salivary glands</p>	<p>gallbladder epiglottis tongue soft palate pancreas ileum anus duodenum</p>
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Exercise 9. Say what organ is spoken about:

I. This organ is the largest gland in the human body. It is in the upper part of the abdominal cavity under the diaphragm in the right side of the abdomen. Its upper surface is convex. This organ consists of small lobules connected together by connective tissue, different vessels and nerves.

II. This organ is pyriform (грушевидный) in shape. It is a dilated portion of the alimentary canal. It is in the upper part of the abdomen under the diaphragm. The liver is above this organ, and the colon is below it. The pancreas is behind this organ.

III. It is the beginning of the alimentary tract and the digestion starts here when taking the first bite of food. Chewing breaks the food into pieces that are more easily digested, while saliva mixes with food to begin the process of breaking it down into a form your body can absorb and use.

IV. This organ is the portion of the alimentary tract that is located between the stomach and rectum. In the human being it is divided in to two parts. Its function is to digest food and to enable the nutrients released from that food to enter into the

bloodstream.

V. It is a tubular organ that lies behind the trachea and heart and in front of the spinal column; it passes through the diaphragm before entering the stomach.

VI. This organ is a part of two different systems of the body, digestive system and respiratory system. It is a passageway leading from the mouth and nose to the esophagus and larynx.

VII. This is a long, narrow gland that is located across the upper abdomen, behind the stomach and the spleen. It produces important digestive enzymes and hormone called insulin.

VIII. This is a hollow organ located beneath the right lobe of the liver and measures 8 centimeters in length. Its function is to store bile.

IX. This is a thin cartilaginous flap that covers the entrance to the larynx during swallowing, preventing food from entering the trachea.

X. It is the last part of the digestive system. Water is absorbed here and the remaining waste material is stored as feces before being removed by defecation.

Exercise 10. Fill in prepositions from the box below where necessary:

If; by; or; in; for; through

One of the most common locations _____ a foreign body is the alimentary tract.

It is possible _____ foreign bodies to enter the tract from the mouth, or from the rectum.

The objects most commonly swallowed _____ children are coins. Meat impaction is more common _____ adults.

Swallowed objects are more likely to lodge ____ the esophagus or stomach than ____ the pharynx or duodenum.

____ the person who swallowed the foreign body is doing well, usually a x-ray image will be taken. It will show any metal objects, and should be repeated a few days later to confirm that the object has passed all the way ____ the alimentary tract. Also it needs to be confirmed that the object is not stuck ____ the airways, in the bronchial tree.

Most objects that are swallowed will pass all the way ____ the gastrointestinal tract unaided.

____ the foreign body causes problems like pain, vomiting ____ bleeding it must be removed.

Exercise 11. Arrange the following sentences in a correct order to describe the following term “stomach”:

1. The stomach has three tasks in digestion: mixing foods with gastric juices, storing swallowed food and liquid, moving food into the small intestine.
2. It is located in the upper part of the abdomen under the diaphragm.
3. The stomach is a hollow, saclike organ enclosed in a muscular wall.
4. The stomach receives food from the esophagus.
5. These flexible muscles allow the stomach to extend when you eat.
6. As food reaches the end of the esophagus, it enters the stomach through a muscular valve called the lower esophageal sphincter.

Exercise 12. Continue the following sentences using the text to describe the following term “intestine”:

1. Intestine is the last part of the alimentary tract and consist of and
2. The small intestine is composed of,,
3. The large intestine is divided into, and
4. The function of intestine is and then

Exercise 13. Join two parts of the sentences and translate:

The boy laid sleeping	he decided to postpone the meeting.
Being very ill,	he realized that he had to give up.
Being busy,	the doctor asked him many questions.
The specialists operating on the patients	she couldn't understand some words.
Examining the patient,	could do anything to save the man's life.
Translating the article	when the nurse came in.
Nobody standing there	he didn't attend lectures last week.
Understanding that it will not help,	are called surgeons.

Exercise 14. Put questions to the underlined words:

1. First step in the digestive system take place in the mouth.
2. The soft palate is a continuation of the soft tissues covering the hart palate.
3. The weight of the largest of the salivary glands is 28gr.
4. The shape of the stomach changes when it dilates.
5. The duodenum is called so because its length measures about the length of twelve fingers.
6. The liver consisting of lobes is covered with a fibrous coat.
7. Foreign body that enters the alimentary tract can cause different problems.
8. Gastroendoscopy shows all the damages in the stomach.

Exercise 16. Open the brackets using the verb in the appropriate form:

1. The mechanical digestion of the food (to start) by the action of mastication and the wetting contact of saliva.
2. The esophagus (to line) with smooth muscle, which forces the food down the pipe to the stomach.
3. When food is swallowed, the stomach (to produce) hydrochloric acid.
4. The shape of the stomach (to change) when it delates and its borders greatly extend.
5. The liver (to play) a major role in metabolism and (to have) a number of functions

in the body.

6. Discharged from the liver bile (to store) in the gallbladder.

7. 95% of absorption of nutrients (to occur) in the small intestine.

8. Waste material (to eliminate) from the rectum during defecation.

Self-check

I. Answer the questions:

What is the alimentary tract?

What does the alimentary tract consist of?

What is the stomach?

What is the function of the large intestine?

What is the function of the gallbladder?

II. Define the terms: stomach, intestines, gallbladder

PHYSIOLOGY OF THE ALIMENTARY TRACT

Exercise 1. Key words:

verb	noun	adjective
break down	absorption	digestive
choke	brain stem	smooth
distribute	enzymes	tubular
moisten	epiglottis	
require	feces	
swallow	flap	
trigger	fuel	
	source	

starch

Exercise 2. a) Make nouns from the verbs with the help of suffix *-tion*:

to absorb, to product, to masticate, to create, to excrete, to digest, to stimulate, to salivate, to activate, to distribute, to penetrate, to irritate, to inhale.

b) make word combinations

Absorption of	process
Distribution of	bacteria
Activation of	the peritoneum
Excretion of	fats
Production of	food
Irritation of	oxygen
Mastication of	enzymes
Penetration of	waste substances

Exercise 3. Some of the following words don't form adjectives with the help of suffixes. Try to form adjectives from the given nouns:

mouth -	breastbone -
liver -	brain -
kidney -	lung -
saliva -	skull -
pancreas -	rib -
stomach -	heart -
tongue -	tooth -

Exercise 4. Combine the adjectives with the proper nouns given below.

Adjectives: inner, serous, salivary, hard, exact, vital, connective, pale;

Nouns: length, palate, coat, capacity, tissue, gland, layer, face.

Exercise 5. Fill the dialogue with necessary words from the box:

Esophagus, the oral cavity, the pancreas, stomach, rectum, musculomembraneous, the anus, pharynx, ileum, small intestine, large intestine, the liver, duodenum, caecum, jejunum, colon, mouth.

- Hello. How do you do!
- How do you do!
- Are you free now?
- Yes, I'm. I'm trying to prepare my anatomy lesson on alimentary tract! But I don't know it well. Can you help me?
- Sure. To begin with, the alimentary tract is a canal about 8.5 meters in length. It extends from to
- I know this. If I'm not mistaken it consists of the,,,, and
- Yes, you are right.
- Where does the food go from the mouth?
- It passes through the pharynx to the esophagus and then to the stomach.
- Certainly.
- I've already mentioned that there is the small intestine and the large intestine in the alimentary tract. The small intestine is composed of the,and Do you want me to tell you about the large intestine?
- No, thanks. As far as I know it is divided into, and
- Right. Do you know that the largest gland in the human body is
- Yes, I do. I know that the gallbladder andare also the large glands of the alimentary tract.
- You are absolutely right.
- Thank you very much for helping me.

Exercise 6. Read the text:

Physiology of the alimentary tract

The first step in the alimentary system can begin before the food is in your mouth. When you smell or see food, you start to salivate, thus beginning the digestive process.

Food is the body's source of fuel. Nutrients in food give the body's cells the energy they need to operate. Before food can be used, it has to be broken down into tiny pieces. Then it is easy to absorb by the body. In humans, proteins are broken down into amino acids, starches into sugars, and fats into fatty acids and glycerol.

During digestion two main processes occur at the same time:

- **Mechanical Digestion:** larger pieces of food break down into smaller pieces before the chemical digestion. Mechanical digestion starts in the mouth and continues in to the stomach.
- **Chemical Digestion:** several different enzymes break down macromolecules into smaller molecules. They are absorbed more efficiently. Chemical digestion starts with saliva and continues into the intestines.

In the alimentary tract the food really passes through the body rather than being in the body. The smooth muscles of the tubular digestive organs move the food efficiently along as it is broken down into absorb-able atoms and molecules. During absorption, the nutrients that come from food (such as proteins, fats, carbohydrates, vitamins, and minerals) pass through the wall of the small intestine and into the bloodstream and lymph. In this way nutrients are distributed throughout the rest of the body. In the large intestine there is re-absorption of water and absorption of some minerals and feces are formed.

Digestion begins in the mouth. A brain reflex triggers the flow of saliva when we see or think about food. Saliva moistens the food while the teeth chew it up and make it easier to swallow. The digestive enzyme in saliva, starts to break down starch into simpler sugars before the food leaves the mouth. The nervous pathway involved in salivary excretion requires stimulation of receptors in the mouth, sensory impulses to the brain stem, and parasympathetic impulses to salivary glands.

Swallowing your food happens when the muscles in your tongue and mouth move the food into your pharynx. The pharynx is the passageway for food and air. A small flap of skin called the epiglottis over the pharynx prevents food from entering the trachea and thus choking.

Exercise 7. Answer the following questions to the text:

1. When does the digestive process begin?
2. How many processes occur during digestion?
3. What is the difference between mechanical and chemical digestions?
4. What is the function of the smooth muscles?
5. What nutrients come from food during absorption?
6. What is the role of saliva in mastication?
7. What is the function of the enzyme?
8. How does the process of swallowing occur?

Exercise 8. Match the terms with their definitions:

1. proteins	a) any of various proteins, as pepsin, originating from living cells and capable of producing certain chemical changes in organic substances;
2. fats	b) a substance that has amino acids, compounds and carbon, hydrogen, oxygen, nitrogen and sometimes sulfur and is found in many foods (such as meat, milk, eggs, and beans) that is an important part of the human diet;
3. starches	c) any of various soft, solid, or semisolid organic compounds forming the esters of glycerol and fatty acids and their associated organic groups;
4. enzymes	d) the process by which food is converted into substances that can be absorbed and assimilated by the body;
5. digestion	e) the process in the human or animal body that makes something pass from the mouth, to the pharynx, and into the esophagus, while
6. mastication	

7. choking	shutting the epiglottis;
8. swallowing	f) the mechanical obstruction of the flow of air from the environment into the lungs. It prevents breathing, and can be partial or complete; g) a carbohydrate consisting of a large number of glucose units joined by glycosidic bonds; h) the process by which food is crushed and ground by teeth.

Exercise 9. Guess what enzymes are produced by following organs:

Site	Enzyme	Role in Digestion
Mouth		Breaks down starches into disaccharides.
Stomach		Breaks down proteins into larger peptides.
Small intestine (from the pancreas)		Continues the breakdown of starch.
		Continues the breakdown of protein.
		Breaks down fat.
Small intestine		Breaks down remaining disaccharides into monosaccharades.
		Breaks down dipeptides into amino acids.

Salivary amylase, Pepsin, Amylase, Trypsin, Lipase, Sucrase and lactase, Pepsidase

Exercise 10. Choose the right answer:

1. All the following are regions of the stomach except:

- a) The fundus b) the cardia c) the pylorus d) the hilus

1. All the following are regions of the small intestines except:

- a) Jejunum b) ileum c) duodenum d) colon

3. Bile is produced by :

- a) gallbladder b) liver c) duodenum d) pancreas

4. Most absorption occurs in:

- a) esophagus b) jejunum c) the lining of the stomach d) along the gastrointestinal tract

5. The small intestines meets with the large intestine in the

- a) rectum b) sigmoid colon c) caecum d) fundus

6. Insulin is produced by :

- a) the liver b) the spleen c) the pancreas d) gallbladder

7. The pancreas is located close to the:

- a) colon b) the stomach c) the liver d) jejunum

8. all the following are the functions of the oral cavity except :

- a) mechanical digestion b) digestion of proteins c) food lubrication d) chemical digestion

Exercise 11. Match the synonyms:

1. sac	1. stratum
2. oral cavity	2. Genu
3. pituitary gland	3. orifice, foramen
4. intestines	4. Gingiva
5. opening	5. Umbilicus
6. Navel	6. humerus
7. Gum	7. hypophysis
8. layer	8. bursa
9. Knee	9. mouth
10. upper arm bone	10 bowels.

Exercise 12. Open the brackets and put the verbs in a correct form:

1. The left and the right heart chambers (to divide) by the septum.
2. The alimentary tract (to release) hormones to help regulate the digestive process.
3. The patient (not to sleep) since early morning.

4. In 1892 Prof. Lesgaft (to divide) the muscles into two basic groups.
5. The operation (to perform) yesterday.
6. When the doctor (to examine) the patient he (to determine) murmurs.
7. The head of the pancreas (to connect) to the duodenum through the pancreatic duct.
8. Enlargement of the liver (to reveal) on examination yesterday.

Exercise 13. Put questions to the underlined words:

1. The alimentary tract consists of a twisting tube about 8½ metres long.
2. We ingest food that consists of proteins, fats and carbohydrates.
3. The body became resistant to insulin in patient with Diabetes type II.
4. The scientists have already identified Helicobacter Pylori to be the cause of gastritis.
5. The digestion of starch will begin with saliva that contains salivary amylase.
6. Some foods and drinks can affect the function of the esophageal sphincter.
7. The esophageal sphincter will be weakened by smoking.
8. The pancreas was damaged by its own digestive chemicals in pancreatitis.

Exercise 14. Arrange the following sentences in a correct order to describe the following term “enzyme”:

1. Enzyme does not control the direction of the reaction, it increases the rates of the reactions.
2. A substance produced by the body to assist in a chemical reaction.
3. Very few biochemical reactions carry on at a significant rate without the presence of an enzyme.
4. It acts as a catalyst, increasing the rate at which a chemical reaction occurs.
5. The human body probably contains about 10,000 different enzymes.

Exercise 15. Arrange the following sentences in a correct order to describe the following term “The alimentary tract”:

1. During digestion proteins, fats, carbohydrates, vitamins and minerals are broken

down for better absorption.

2. It consists of the mouth, pharynx, esophagus, stomach, small intestine, and large intestine.
3. The alimentary tract is a musculomembraneous canal about 8½ metres in length.
4. The liver with gallbladder and pancreas are the large glands of the alimentary tract.
5. Three main processes take part in the alimentary tract: digestion, absorption and excretion.
6. It extends from the oral cavity to the anus.

Exercise 16. Continue the following sentences to describe the following term “digestion”:

1. Digestion is a process
2. Digestion begins
3. During digestion two main processes occur at the same time
4. Food is broking down into tiny pieces during
5. On chemical digestion enzyme in saliva starts

Self-check

I. Answer the questions:

When does the digestive process begin?

How many processes occur during digestion?

What nutrients come from food during absorption?

What is the role of saliva in mastication?

How does the process of swallowing occur?

II. Define the terms: alimentary tract, digestion, enzyme

THE ENDOCRINE GLANDS

Exercise 1. Key words:

nouns	verbs	adjectives/adverbs
acromegaly	affect	adrenal
band	convert	against
carbohydrate	join	ductless
dwarfism	lie	endocrine
excitement	pour (into)	involuntary
fear	raise	narrow
fuel	release	particularly
masculinity		saccular
medulla		
pineal gland		
pituitary gland		
thyroid		

Exercise 2. Guess the meaning of the following words without using a dictionary:

Endocrine, gland, hypophysis, oversecretion, hormone, base, functioning, peristalsis, adrenalin, glucose, antibody, gigantism, destruction, protein, control, reservoir, manufacture, acromegaly.

Exercise 3. a) Read the word combinations:

Gland: enlarged gland; swollen gland; salivary gland; pituitary gland; glands secrete hormones.

Amount: considerable amount; exact amount; to reduce the amount; limited amount; excessive amount; total amount.

Affect: to affect greatly; to affect indirectly; to affect slightly; to affect significantly.

Circulation: poor circulation; systemic circulation; pulmonary circulation; to improve circulation; to stimulate circulation.

b) Make up short sentences using the above given word combinations:

Exercise 4. Read the text:

The endocrine system

The endocrine system refers to the collection of cells, glands, and tissues of an organism that secrete hormones directly into the blood stream to control the organism's physiological activity.

A hormone is a special chemical released by one or more cells that affects cells in other parts of the organism. Only a small amount of hormone is required to alter cell metabolism. It is a chemical messenger that transports a signal from one cell to another. They affect many different processes in the body including growth and development, metabolism, sexual function, behavior, reproduction, mood. The field of the study dealing with the endocrine system and its disorders is called endocrinology.

A gland is an organ which is able to make substances called secretion of the gland. The glands are the chemical laboratories of the body. All glands in the human body can be divided into glands with ducts and ductless. The glands with ducts produce secretion called external secretion. The examples of these glands are the salivary glands, gastric glands, pancreas and sweat glands.

Ductless glands have no duct but they make a secretion which they pour into the blood stream. These secretions are called internal secretions or hormones, and glands which produce them are also called endocrine glands.

The major endocrine glands are the pituitary (hypophysis), pineal, thymus, thyroid, adrenal glands, and pancreas.

The thyroid gland lies in the front of the neck. It consists of two lobes lying on either side, joined by a narrow band which crosses the trachea immediately below the larynx. The gland is well supplied with blood vessels and consists essentially of secreting cells. The cells secrete thyroxin, which passes into the circulation. Thyroxin controls the general metabolism or activity of the body tissues.

The adrenal glands are two small triangular glands lying one over each kidney. They consist of two parts, cortex and medulla. The outer part produces a secretion which affects sex. Oversecretion produces masculinity in the female and in the male it produces too early development of the male reproductive organs.

The medulla produces a very important secretion called adrenalin. Its secreted amount increases in excitement and strong emotions such as fear or anger.

The pituitary gland (hypophysis) is a small gland about the size of a pea and yet is of great importance. It lies in the pituitary fossa in the base of the skull. It consists of an anterior and a posterior lobe.

The anterior lobe is larger and produces a number of important hormones affecting growth and sexual development and the functioning of the ductless glands, particularly the thyroid and the adrenal glands. Undersecretion of this lobe in childhood causes dwarfism. Oversecretion causes overgrowth or gigantism. In the adult this oversecretion causes overgrowth of the head, hands, and feet, particularly affecting the lower jaw. This condition is known as acromegaly.

The posterior lobe produces the secretion known as pituitrin. This stimulates involuntary muscle and therefore contracts the blood vessels and raises blood pressure, stimulates peristalsis, contracts the uterus; it affects the use of water by the body.

The pineal gland is located deep in the brain in an area called the epithalamus, where the two halves of the brain join. In humans, this is situated in the middle of the brain; it sits in a groove just above the thalamus, which is an area that co-ordinates a variety of functions related to our senses. The pineal gland contains high levels of calcium and can be used by radiographers to mark the middle of the brain in X-ray images. The pineal gland secretes the hormone melatonin. Melatonin is best known for the role it plays in regulating sleep patterns, that are also called circadian rhythms. The pineal gland also plays a role in the regulation of female hormone levels, and it may affect fertility and the menstrual cycle.

The thymus gland, located behind your sternum and between your lungs, is only active until puberty. After puberty, the thymus starts to slowly shrink and become replaced by fat. Thymosin is the hormone of the thymus, and it stimulates the development of disease-fighting T cells.

The thymus gland will not function throughout a full lifetime, but it has a big responsibility when it's active—helping the body protect itself against autoimmunity,

which occurs when the immune system turns against itself. Therefore, the thymus plays a vital role in the lymphatic system and endocrine system.

The *pancreas* is a compound saccular gland lying across the back of the abdomen behind the stomach. It produces both external and internal secretion. The external secretion is the pancreatic juice that plays an important part in the process of digestion. The internal secretion is insulin that controls the metabolism of carbohydrates.

Exercise 5. Answer the questions:

1. What is endocrinology?
2. How are glands in the human body classified?
3. What is hormone?
4. What are the major endocrine glands?
5. What is the structure of the thyroid gland?
6. What does thyroxin control?
7. What is the structure of the adrenal glands?
8. When is adrenalin secreted?
9. What is the structure of the pituitary gland?
10. What does the pituitary gland affect?
11. Where is the pineal gland situated?
12. What is melatonin?
13. Where is the thymus located?
14. What does thymosin stimulate?
15. What is the external secretion of the pancreas?
16. What is the internal secretion of the pancreas?

Exercise 6. Form new words:

a) nouns with the prefix OVER meaning “понад, вверх”. Translate them:

Model: over+ dosage → overdosage (передозування)

weight, cooling, heating, work, salt, sensitive, sleep, use, talkative, curious, load, excitement, dose, estimate, eating, growth, development, action.

b) nouns with the prefix UNDER meaning „під, нижче”. Translate them.

Model: under+ dose →underdose (недостатня доза)

estimate, salted, developed, weight, graduate, ventilation, act, nourished

c) adjectives using the suffix –LESS meaning “відсутність”. Translate them.

Model: power + less—powerless (безсилий)

Care, duct, fear, hope, pain, color, taste, use, harm, meaning, shame.

Exercise 7. Match the terms to their definitions:

1. acromegaly	a) triangle-shaped glands located on top of the kidneys;
2. gland	b) a small, somewhat cherry-shaped double-lobed structure attached to the base of the brain, constituting the master endocrine gland affecting all hormonal functions of the body;
3. gigantism	c) a large endocrine gland situated in the base of the neck concerned with regulation of the metabolic rate;
4. adrenal gland	d) Increase in size of the hands, feet and the face due to excessive production of “growth hormone”;
5. thyroid gland	e) an organ or group of cells that is specialized for synthesizing and secreting fluids either for use in the body or for excretion;
6. hypophysis	f) abnormal growth causing excessive height, most commonly due to oversecretion during childhood of “growth hormone”.

Exercise 8. Put the words from the table into an appropriate gap:

Influence; controlling; eight major glands; diabetes; supplements; a hormone disorder;
hormones

Your endocrine system includes ... throughout your body. These glands make
If your hormone levels are too high or too low, you may have Hormone diseases

also occur if your body does not respond to hormones the way it is supposed to. Stress, infection and changes in your blood's fluid and electrolyte balance can also ... hormone levels. In the United States, the most common endocrine disease is There are many others. They are usually treated by ... how much hormone your body makes. Hormone ... can help if the problem is too little of a hormone.

Exercise 9. Say whether the following statements are true or false. Comment on your answer.

1. A hormone is a chemical released by a cell or a gland in one part of the body that sends forth messages that affect cells in other parts of the organism.
2. Some non-endocrine organs such as the brain, heart, lungs also produce and release hormones.
3. The thyroid gland secretes hormones which are necessary for normal digestion.
4. The thyroid is generally asymmetric, with the right lobe being significantly larger than the left one.
5. The posterior lobe of the hypophysis produces the secretion known as thyroxin.
6. The hypophysis and the gall-gladder are of the size of a pea.
7. The amount of adrenalin increases in excitement and strong emotions.
8. The thyroid gland is well supplied with blood vessels and consists mainly of secreting cells.
9. Oversection of the adrenal gland cortex does not affect sex.

Exercise 10. Open the brackets using the correct form of the verb. Translate the sentences:

1. Thyroxin (to control) the general metabolism or activity of the body tissues
2. The patient already (to treat) by the doctor from pneumonia.
3. The wound (to be) usually dressed by the nurse.
4. Blood pressure (to take) now.
5. Skin irritation (to cause) by overdosage of the drug.
6. The anterior lobe of the hypothesis (to produce) a number of important hormones

7. I (to treat) at this clinic for acute pneumonia last week.
8. We were told that the direction of the nerve fibers already (to establish) experimentally.
9. The thyroid gland (to supply) well with blood vessels.

Exercise 11. Make up questions to the underlined words:

1. The hormones are delivered to various organs.
2. The thyroid gland is well supplied with blood vessels.
3. The patient has been recommended to consult his pharmacist for professional advice on medicines.
4. Many hormones affect metabolism.
5. The chemical composition of some hormones is well-known.
6. Each gland consists of the glandular epithelial tissue.
7. The hormones affect the functions of the different parts of the nervous system.
8. The pituitary gland is about the size of a pea.
9. The outer part of the adrenal glands produces a secretion which affects sex.

Exercise 12. Arrange the following sentences in a correct order to describe the following terms.

A) The endocrine glands

1. Glands which produce internal secretions or hormones are called endocrine glands.
2. Ductless glands make a secretion which they pour into the blood stream.
3. The endocrine glands regulate all functions of the body.
4. All glands in the human body can be divided into glands with ducts and ductless.
5. The chief ductless glands are: the thyroid gland, the adrenal glands and the pituitary gland.

B) The thyroid gland

1. The cells of the thyroid secrete thyroxin, which passes into the circulation.
2. The thyroid gland lies in the front of the neck.

3. The gland is well supplied with blood vessels and consists essentially of secreting cells.
4. Thyroxin controls the general metabolism or activity of the body tissues.
5. The thyroid consists of two lobes lying on either side of the neck.

C) Adrenal glands

1. The adrenal glands consist of two parts, cortex and medulla.
2. Adrenalin increases in excitement and strong emotions such as fear or anger.
3. The adrenal glands are two small triangular glands lying one over each kidney.
4. The medulla produces a very important secretion called adrenalin
5. The outer part produces a secretion which affects sex.

D) The pituitary gland

1. The pituitary gland lies in the pituitary fossa in the base of the skull.
2. The anterior lobe produces a number of important hormones affecting growth and sexual development and the functioning of the thyroid and the adrenal glands.
3. The pituitary gland (hypophysis) is a small gland about the size of a pea.
4. Pituitrin stimulates involuntary muscle and therefore contracts the blood vessels and raises blood pressure, stimulates peristalsis.
5. The posterior lobe produces the secretion known as pituitrin.

Self-control

I. Answer the questions:

1. What is endocrinology?
2. How are glands in the human body classified?
3. What is hormone?
4. What are the major endocrine glands?
5. What does thyroxin control?
6. When is adrenalin secreted?
7. What does the pituitary gland affect?

8. What is melatonin?
9. What does thymosin stimulate?
10. What is the external secretion of the pancreas?
11. What is the internal secretion of the pancreas?

II. Define the term: Endocrine system, hormone, Thyroid gland, Adrenal glands, Pituitary gland

THE ANATOMY AND PHYSIOLOGY OF THE URINARY SYSTEM

Exercise 1. Key words:

verb	noun	adjective
alert	breakdown	bean-shaped
consume	extremity	paired
convey	fungi	soluble
discharge	renal pelvis	temporary
eliminate	renal cortex	
expand	urea	
tighten	ureter	
	urethra	

Exercise 2. Form nouns with the help of suffixes:

–**sion/-tion**: to urinate, to secrete, to eliminate, to manifest, to expand.

-**ment**: to improve, to enlarge, to move, to attach, to achieve.

-**ance**: to appear, to differ, to depend, to maintain, to correspond.

Exercise 3. For the following medical terms write the suffix and its meaning.

The first word is an example that is completed for you.

Term

Meaning

1. ili/ac

pertaining to, relating to ilium (lateral portion of hip bone)

2. abdomin/al

3. inguin/al

4. hepat/ic

5. umbilic/al

6. ren/al

7. gastr/ic

8. thorac/ic

9. cervic/al

10. lumb/ar

Exercise 4. Read the text:

THE URINARY SYSTEM

The urinary system is a group of organs in the body concerned with filtering out excess of fluid and wastes from the bloodstream. Wastes in the blood come from the normal breakdown of tissues and from food.

The urinary system keeps the chemicals and water in your body balanced. A type of waste called urea is removed from the blood by the urinary system. Urea is produced when foods containing protein, such as meat, are broken down in the body and is carried in the bloodstream to the kidneys.

The urinary system consists of two kidneys, which secrete the urine, the ureters, which convey urine to the urinary bladder, where it is stored for some time; and the urethra, through which it is discharged from the body.

The kidneys are paired bean-shaped organs with two surfaces, two borders, and an upper and lower extremity. There are three major regions of the kidney: the renal cortex, the renal medulla and the renal pelvis. The kidneys are situated behind the peritoneum. They are covered by the renal capsule.

The functional unit of each kidney is a nephron. Its chief function is to regulate the concentration of water and soluble substances by filtering the blood, reabsorbing what is needed and excreting the rest as urine. The nephron eliminates waste

substances from the body, regulates blood volume and blood pressure and regulates blood pH.

The ureters are two tubes which convey the urine from the kidneys to the urinary bladder. Muscles in the ureter walls continually tighten and relax forcing urine away from the kidneys.

The urinary bladder is a triangle-shaped, hollow musculomembranous organ located in the lower part of the abdomen. It is held in place by ligaments attached to other organs and the pelvic bones. The urinary bladder is a temporary storage for the urine. The bladder's walls relax and expand to store urine, and contract to empty it. Nerves in the bladder alert a person when it is time to urinate.

The urethra is a tube that connects the urinary bladder with the outside of the body. Male and female urethra differs in shape and length. The brain signals the bladder muscles to tighten, which squeezes urine out of the bladder. Normal urine is sterile fluid which contains fluids, salts and waste products, but it is free of bacteria, viruses and fungi.

Exercise 5. Find corresponding definition to the words on the left:

1. kidney	a) each of the functional units in the kidney, consisting of a glomerulus and its associated tubule, through which the glomerular filtrate passes before emerging as urine
2. ureter	b) a membranous sac in which the urine, excreted from the kidneys, is stored
3. urethra	c) each of a pair of organs in the abdominal cavity of mammals, birds, that excrete urine
4. urinary bladder	d) colorless crystalline compound that is the main nitrogenous breakdown product of protein metabolism in mammals
5. renal cortex	e) the duct by which urine is conveyed out of the body from the bladder
6. nerves	f) the duct by which urine passes from the kidney to the bladder or the cloaca

7. nephron	g) the outer portion of the kidney containing the glomeruli and the tubules
8. urea	h) a watery, typically yellowish fluid which contains nitrogen compounds such as urea and other waste substances removed from the blood by the kidneys
9. urine	i) any of the cordlike bundles of fibers that conduct sensory or motor impulses

Exercise 6. Fill in the gaps with the words and word-combinations from the box:

Urologic disease can involve _____ dysfunction of the urinary system. Glomerulonephritis is a type of kidney disease in which the kidneys' filters become inflamed and _____, and slowly lose their ability _____ from the blood to make urine. Patients may experience the following _____: fatigue, high blood pressure, _____, blood and protein in the urine.

Unfortunately, even with today's medicine, kidney disease cannot be _____. Treatments focus on slowing _____ of the disease and preventing _____. Treatment may include: drug therapy, diet modification, dialysis (a medical treatment to remove wastes from _____) and kidney transplantation.

congenital or acquired, complications, scarred, the blood, to remove wastes and excess fluid, symptoms, decreased urine output, cured, the progression

Exercise 7. Answer the questions to the text:

1. What does the urinary system consist of?
2. What is urine?
3. Where are the kidneys situated?
4. What is the function of nephrons?

5. What is the function of the ureters?
6. Where is the urine stored before it is discharged from the body?
7. What is urethra?
8. What is the function of the urethra?
9. What conveys urine from the kidneys?
10. What is the function of the urinary bladder?

Exercise 8. Complete the sentences according to the text:

1. The urine is stored in _____.
2. The nephrons regulate _____.
3. _____ conveys urine from the kidneys.
4. All urine is excreted from the body by _____.
5. Normal urine is free of _____.
6. _____ is the hollow funnel, into which urine is discharged before entering the ureter.
7. A renal stone is a solid piece of material that forms in the kidney from substances in the _____.
8. _____ are covered by the renal capsule.

Exercise 9. Choose the right variant:

1. _____ convey urine to the urinary bladder.
A) Urethra B) ureters C) kidney D) nephron E) urinary bladder
2. Urine is discharged from the body through _____.
A) Urethra B) ureters C) kidneys D) nephron E) urinary bladder
3. The chief function of _____ is to regulate the concentration of water and soluble substances.
A) Urethra B) ureters C) nephron D) nerves E) bladder
4. _____ is a triangle-shaped, hollow musculomembranous organ.
A) Kidney B) urinary bladder C) renal pelvis D) ureter E) stomach
5. _____ is divided into three portions, the prostatic, membranous, and cavernous.

A) Male urethra B) female urethra C) ureters D) urinary bladder E) kidney

6. The urinary bladder _____ in place by ligaments.

- A) is tightened B) is held C) is attached D) is divided
E) is bounded

7. _____ has a characteristic bean-shaped form.

- A) Urinary bladder B) renal pelvis C) kidney D) liver E) spleen

8. _____ measures from 25 to 30 cm in length.

- A) Urethra B) ureter C) kidney D) small intestine E) esophagus

9. Inflammation of the nephrons in the kidneys is called _____.

- A) Nephrolithiasis B) nephritis C) pyelonephritis D) cystitis E) hepatitis

10. Nephrons _____.

- A) eliminate wastes from the body B) regulate blood volume and pressure
C) control levels of electrolytes and metabolites
D) regulate blood pH E) all of the above

Exercise 10. Find synonyms to the words *in italics* in the text (sometimes more than 1 word is possible):

to keep the urine in the bladder,

to remove urine from the body,

to carry urine out of the body,

these organs *are placed* behind the peritoneum,

substances that can *be dissolved*, *absorb* substances *again*,

inflammation of nephrons,

unwanted (unnecessary) materials.

Exercise 11. Find the proper object to the verb and translate it into your native language:

1. to excrete	a) muscles in the bladder
2. to alert	b) an infection

3. to regulate	c) urine out of the body
4. to remove	d) food and fluid
5. to consume	e) blood volume and pressure
6. to break down	f) waste substances
7. to maintain	g) nerves in the brain
8. tighten and relax	h) active tissues
9. to filter	i) water balance
10. to cause	k) blood through the nephrons

Exercise 12. Fill in the gaps with the words from the box:

nephrons	urine	bladder	kidneys	wastes	urea	ureters
nerves						

1. in the blood come from the normal breakdown of active tissues.
2. Normal contains fluids, salts and waste products.
3. usually holds 300-350 ml of urine.
4. carry urine from the kidneys to the bladder.
5. All the blood in our bodies passes through several times a day.
6. Urine is formed by together with water and other waste substances.
7. A person gets an alarm from the in the bladder when it is time to urinate.
8. In humans, a normal kidney contains 800,000 to 1.5 million.....

Exercise 13. Find the definitions to the terms mentioned in ex. 12:

1. It filters waste products and urea from the blood.
2. It is composed of waste products and urea and usually averages 1-2 L a day.
3. These are the materials performed as a result of a breakdown of active tissues.
4. It is an organic compound, which is colorless, odorless, solid and highly soluble

in water.

5. It is an organ in the pelvis. When empty, it is about the size and shape of a pear.
6. It serves as a natural filter of the blood, and removes wastes, which are transferred to the urinary bladder.
7. They are tubes made of smooth muscle fibers that propel urine from the kidneys to the urinary bladder.
8. It is a cable-like bundle of fibers (the long projections of neurons) in the peripheral nervous system.

Exercise 14. Agree or contradict the following statements:

1. Urine is stored in the urethra before discharging from the body.
2. A nephron regulates the concentration of water and soluble substances.
3. The urinary bladder is a hollow bean-shaped organ, which discharges urine from the body.
4. The ureters convey the urine from the kidneys to the urinary bladder.
5. Kidney is a muscular sac which stores the urine before eliminating it from the body.
6. The urine is discharged from the body through the ureters.
7. Urethra is a tube that connects the kidney and the urinary bladder.
8. The main function of the ureters is to regulate the concentration of water and soluble substances.

Exercise 15. Make questions to the underlined words:

1. The human organism can fight against the microorganisms.
2. The doctor has just examined this patient.
3. The administrations were changed to prevent nephritis.
4. The kidneys perform regulation of the body's salt, potassium and acid.
5. Bacteria cause inflammation of the urinary bladder.
6. The bladder is composed of serous, muscular, submucous, and mucous coats.
7. High blood pressure caused kidney damage in this patient.

8. The symptoms of acute pyelonephritis are aching pain in the lumbar region and fever.

Exercise 16. Open the brackets and translate the sentences:

1. A kidney infection already (to develop) because of urine standing still.
2. The urine (to form) in three steps: Filtration, Reabsorption, and Secretion.
3. Significant sex difference (to exist) in the shape and length of male and female urethra.
4. A test in the structure of the kidneys (to pass) the day after tomorrow.
5. Last night she (to experience) an attack of acute pain in the lumbar region.
6. The inflammation of nephrons in the kidneys (to call) nephritis.
7. The patient (to complain) of pain and burning during urination a week ago.
8. When he entered the room, they (to carry out) the experiment.

Exercise 17. Arrange the following sentences in a correct order to describe the term “the kidney”:

1. The function of the kidneys is to secrete the urine.
2. The major regions of the kidney are the renal cortex, the renal medulla and the renal pelvis.
3. The kidneys are paired bean-shaped organs with two surfaces, two borders, and an upper and lower extremity.
4. The urinary system consists of two kidneys, the ureters, the urinary bladder and the urethra.
5. They are covered by the renal capsule.
6. The kidneys are situated in the posterior part of the abdomen, behind the peritoneum.

Exercise 18. Arrange the following sentences in a correct order to describe the term “the urinary system”:

1. The urinary bladder stores the urine until it is discharged from the body through the urethra.
2. The urinary system consists of two kidneys, the ureters, the urinary bladder and the urethra.
3. The urinary system keeps the chemicals and water in your body balanced.
4. The kidneys secrete the urine out of the body.
5. The urinary system is a group of organs in the body concerned with filtering out excess of fluid and wastes from the bloodstream.
6. The ureters convey urine to the urinary bladder.

Exercise 19. Arrange the following sentences in a correct order to describe the term “the urinary bladder”:

1. Nerves in the bladder alert a person when it is time to urinate.
2. The bladder's walls relax and expand to store urine, and contract to empty it.
3. It is a membranous sac in which the urine, excreted from the kidneys, is stored.
4. The urinary system is a group of organs in the body that filters excess of fluid and wastes from the bloodstream.
5. The urinary system consists of two kidneys, the ureters, the urinary bladder and the urethra.

Self-check

I. Answer the questions:

1. What does the urinary system consist of?
2. What is urine?
3. Where are the kidneys situated?
4. What is the function of nephrons?
5. What is the function of the ureters?
6. Where is the urine stored before it is discharged from the body?
7. What is urethra?

8. What is the function of the urinary bladder?

II. Define the terms: a nephron, the kidney, the urinary system, the urinary bladder

The Reproductive System

Exercise 1. Key words:

Noun	Verb	Adjective
coitus	fertilize	viable
embryo	occur	reproductive
enlargement	release	pubertal
fetus		
gonads		
maturity		
ovaries		
pregnancy		
progesterone		
puberty		
umbilical cord		
uterus		

Exercise 2. Practice reading and guess the meaning of the following words:

Coitus ['kɔɪtəs], fetus ['fi:təs], fertilize ['fɜ:tɪlaɪz], progesterone [prəʊ'dʒestərən], maturity [mə'tjʊərɪti], uterus ['ju:tərəs], placenta [plə'sentə], viable ['vaɪəbl], zygote ['zaɪgəʊt], estrogen ['estrədʒən], enlargement [ɪn'la:dʒmənt].

Exercise 3. Form the new words using the given suffixes:

E.g.: infect – infection

excite – excitement

- **ion (-ation), -sion, -tion**: implant, transport, stimulate, distribute, fertilize, collect, ovulate, menstruate.

- **ment**: require, achieve, treat, develop, enlarge, involve, move, impair, nourish.

Exercise 4. Read the text:

The Reproductive System

The reproductive system is a collection of organs that work together for the purpose of producing a new life. The major organs of the reproductive system include the external genitalia and internal organs. The anatomy of male and female reproductive system is different. The male reproductive system includes the scrotum, testicles, spermatic ducts, sex glands and penis. These organs work together to produce sperm for fertilization of egg cells while producing offspring. Unlike the female reproductive system, most of the male reproductive system is located outside of the body. The female reproductive anatomy includes vagina, uterus, ovaries, and fallopian tubes. Together with male reproductive organs, they lead to the reproduction of human life.

Reproductive physical maturity and the capacity for human reproduction begin during puberty. During puberty, the hypothalamus produces hormones, which stimulate the gonads to produce testosterone (in males) and estrogen and progesterone (in females).

Male puberty generally occurs between the ages of 13-15 and is characterized by the secretion of the male hormone testosterone, which stimulates spermatogenesis, and the development of secondary sexual characteristics (increased height and weight, broadening shoulders, voice deepening, and muscle development).

Female puberty generally occurs between the ages of 9-13, and results in ovulation and menstruation, which involve cyclic hormonal changes in estrogen and progesterone. Secondary sexual characteristics (breast enlargement, widening hips, increased height, weight and fat distribution) also occur as part of the female pubertal process.

Function of the reproductive system is reproduction. Fertilization is the first step in pregnancy. During coitus (sexual intercourse) between a male and a female, semen is released into the vagina and transported through the uterus into the fallopian tube. Fertilization can only occur if intercourse takes place before the time of ovulation that usually occurs “mid-cycle”, or about 14 days before the woman's next menstrual period. At the time of ovulation, the ovum is released from the ovary and transported in the fallopian tube where it remains for about 24-48 hours. Pregnancy is most likely to occur if fresh semen is present when ovulation occurs.

Sperm cells remain viable within the female reproductive tract for about 72 hours. During fertilization, the sperm enters the cell membrane of the ovum so the nuclei of the sperm and egg cells combine to form a zygote.

Various exceptions are possible, for example, in vitro fertilization is a process by which an egg is fertilised by sperm outside the body.

Exercise 5. Answer the questions to the text:

1. What is the reproductive system?
2. What does the word *puberty* mean?
3. What does the hypothalamus regulate?
4. When does male puberty occur?
5. When does female puberty occur?
6. When can fertilization occur?
7. How long do sperm cells remain viable in the reproductive tract?
8. What is a zygote?

Exercise 6. Match the words from the column A to those from the column B to form the word-combinations. There are possible several variants with one word.

Column A	Column B
cell	intercourse
sexual	membrane
pubertal	changes
hormonal	process
voice	tube
fallopian	deepening
widening	lining
uterine	hips

Exercise 7. Match the terms to the definitions:

1. puberty	a) a white crystalline steroid hormone produced primarily in the testes and responsible for the development and maintenance of male secondary sex characteristics;
2. testosterone	
3. miscarriage	b) the act or process of initiating biological reproduction by insemination;
4. estrogen	c) the stage of adolescence in which an individual becomes physiologically capable of sexual reproduction;
5. stillbirth	
6. fertilization	d) any of several steroid hormones produced chiefly by the ovaries and responsible for promoting estrus and the development and maintenance of female secondary sex characteristics;
7. fetus	
8. gonads	e) any organ or gland in which gametes are produced; an ovary or testis.
	f) the unborn offspring that develops from an embryo. Following embryonic development the fetal stage of development takes place. In human prenatal development (fetal development) begins from the ninth week after fertilisation (or eleventh week gestational age) and continues until birth
	g) fetal death that results in a baby born without signs of life

h) also known as spontaneous abortion and pregnancy loss, is the natural death of an embryo or fetus before it is able to survive independently.

Exercise 8. Insert the necessary preposition:

of as via at into

Development of embryo and fetus

The development ___ the mass of cells that will become the infant is called embryogenesis. During this time, cells begin to differentiate ___ the various body systems. The basic outlines of the organ, body, and nervous systems are established. ___ the end of the embryonic stage, the beginnings ___ features such ___ fingers, eyes, mouth, and ears become visible. Also ___ this time, there is development ___ structures important to the support of the embryo, including the placenta and umbilical cord.

After ___ 10 weeks of gestational age, the embryo becomes known ___ a fetus instead. At the beginning of the fetal stage, the risk ___ miscarriage decreases sharply. When the fetal stage commences, a fetus is typically ___ 30 mm in length, and the heart can be seen beating ___ ultrasound; the fetus can be seen making various involuntary motions ___ this stage.

Electrical brain activity is first detected between the 5th and 6th week of gestation.

Exercise 9. Open the brackets. Put the verb in the correct tense form. Pay attention to the conditional sentences 1st type.

E.g.: If you treat this infection at once, you will avoid infertility.

1. The infant (to be fed) artificially, unless the mother's health (to be restored).
2. As soon as it (to be) time of puberty, the endocrine system (to release) sexual hormones.
3. When the egg (to be fertilized), zygote (form).
4. If fresh semen (to be present) during ovulation, fertilization (to occur).
5. The operation (to be continued) as soon as the bleeding (to be stopped).

6. If she (not to take) these medicines she (to have) miscarriage.
7. When the operation (to be over), the doctor (to consult) this pregnant woman.
8. If you (to go) to the doctor right now, you (to recover) more quickly.

Exercise 10. Put questions to the underlined words:

1. The reproductive system is known as a collection of organs that work together for the purpose of producing a new life.
2. Substances such as fluids, hormones, and pheromones are also important to the effective functioning of the reproductive system.
3. The genes that parents pass along to their children are what make children similar to others in their family.
4. Many parts of the male and female reproductive systems that can be affected by cancer.
5. Pregnancy is the time a mother carries the baby from conception until birth.
6. When the baby is ready to be born baby's head presses against the cervix.
7. This pregnant woman has been complaining of nausea for 2 months.
8. Human reproduction is guided at every step by powerful hormones.

Exercise 11. Read the text. Insert the necessary noun:

infertility, testosterone, progesterone, brain, bloodstream, ovulation, estrogen

Hormones and reproduction

In both men and women, reproduction begins in the _____. A part of the brain (hypothalamus) produces a substance called gonadotropin-releasing hormone (GnRH). GnRH causes the pituitary gland to release two hormones into the ____: luteinizing hormone (LH) and follicle-stimulating hormone (FSH).

In men, LH causes the release of the male hormone _____, while FSH causes the testicles to produce sperm. In women, LH and FSH cause eggs to mature and be released (_____). They also cause production of the female hormones _____ and _____.

Many problems with _____ are caused by too little or too much of these hormones, the pattern of hormone levels over time, or problems in the hypothalamus or pituitary gland.

Exercise 12. Open the brackets and put the verbs in the correct tense and voice form:

1. Like all complex organ systems the human reproductive system (to affect) by many diseases.
2. Endocrine hormones (to know) as critical controlling factor in the normal differentiation of the reproductive system.
3. The doctor on duty (to perform) the operation on the uterus right now.
4. Chromosome characteristics (to determine) the genetic sex of a fetus.
5. Genital infections such as chlamydia and gonorrhoea can (to cause) infertility in men.
6. Some diets (to prove) to be significant for increasing fertility lately.
7. Studies (to show) that exercising too much may lead to the release of too many steroid hormones, which can affect fertility.
8. A very low or very high BMI (body mass index) (to disrupt) ovulation and may also affect production of hormones.

Exercise 13. Agree or disagree with the statements given below.

1. Sperm cells remain viable within the female reproductive tract for about 2 hours.
2. The hypothalamus produces hormones, which stimulate the gonads to produce testosterone (in females) and estrogen and progesterone (in females in males).
3. Male puberty generally occurs between the ages of 9-11.
4. Most of the male reproductive system is located outside of the body.
5. Fertilization is the last step in pregnancy.
6. Zygote is a fertilized egg cell that results from the union of a female gamete with a male gamete.

7. Male secondary sexual characteristics include breast enlargement, widening hips, increased height, weight and fat distribution.
8. Increased height and weight, broadening shoulders, voice deepening, and muscle development occur as part of the female pubertal process.

Exercise 14. Complete the sentences:

1. The major organs of the reproductive system include
2. The male reproductive system includes
3. Testosterone stimulates
4. Pregnancy is most likely to occur if
5. The female reproductive anatomy includes
6. Fertilization can only occur if
7. The human reproduction is when
8. If a sperm penetrates the egg,

Exercise 15. Match two parts of the sentences below to make an explanation of what the term “reproductive system” is:

1. In women, this system includes	a) the scrotum, testicles, spermatic ducts, sex glands and penis.
2. In men it includes	b) the first step in pregnancy.
3. The reproductive system is	c) an organ system comprised of male or female organs.
4. Function of the reproductive system is	d) reproduction.
5. Fertilization is	e) vagina, uterus, ovaries, and fallopian tubes.

Exercise 16. Arrange the following sentences in a correct order to describe the term “fertilization”:

1. Fertilization is the first step in pregnancy.
2. The purpose of of ovulation is producing a new life.
3. During fertilization, the nuclei of the sperm and egg cells combine to form a zygote.

4. Fertilization can occur if intercourse takes place before the time of ovulation.
5. Fertilization is the union of a human egg and sperm occurring in the fallopian tube.

Self-check

I. Answer the questions:

When does male puberty occur?

When does female puberty occur?

How long do sperm cells remain viable in the reproductive system?

What is zygote?

When can fertilization be successful?

II. Describe the terms: the reproductive system, fertilization.

THE IMMUNE SYSTEM

Exercise 1. Key words:

verb	noun	adjective
employ	antidote	entirely
	capacity	indirect
	immunity	subcutaneous
	invasion	subsequent
	lack	subcutaneous
	recurrence	
	resistance	

Exercise 2. Pronounce correctly and guess the meaning of the following words:

Microorganisms; infection; specific; absolute; attack; permanent; protection; pathogenic; virulent; toxin; characteristic; symptom; chemical; antidote; antitoxin; organs; bacterial; culture; formation; elements; organism; leucocytosis; bacteria; phagocytes; reaction; vaccine; active; resistance; mechanism; isolate.

Exercise 3. Make nouns with the help of suffix –ation; -tion; -ion:

verb	noun
<i>to infect</i>	<i>infection</i>
to destruct	
to inflame	
to abstain	
to accumulate	
to invade	
to protect	
to form	

Exercise 4. Fill in the gaps with the nouns from exercise 3:

1. His diabetes damaged his circulatory system and fostered a foot *infection* that bedeviled him for the rest of his life.
2. Those people were also more likely than patients without cardiac ... to experience abnormal heart rhythms before they died.
3. Besides permitting sedentary living and hence the ... of possessions, food production was decisive in the history of technology for another reason.
4. Upstream pollution, climate change, and habitat ... threaten the sanctity of this ecosystem.
5. Meanwhile, avoiding offending foods offers the best ... against a severe allergic response.
6. It is possible that memory ... in any given organism relies on several systems.
7. There's no cure for food allergies, just lifestyle adjustments and
8. ... is considered to be the body's second line of defence against infection.

Exercise 5. Choose one new word for each line to make the word combinations, read and notice their meanings:

Immunity, subcutaneous capacity, recurrence

inborn ..., inherited ..., biological

natural ..., artificial ..., relative ..., absolute ...

to prevent from ..., ... of a chronic disease

a ...injection, a ... inflammation

Exercise 6. Read the following text:

The Immune System

Infectious diseases are caused by the invasion and growth of microorganisms in the human body. But the human organism has a specific capacity of resistance against infections which is called **immunity**. **Immunity is classified into** natural and artificial. Under various conditions it may be entirely lacking, it may be relative, rarely it may be absolute. Previous attacks of diseases produce a more or less permanent protection against their recurrence.

In the course of growth in the body many microorganisms produce virulent poisons or toxins which cause characteristic symptoms of a particular disease. To meet the infection the cells of the body produce a chemical antidote which is specific for this particular infection and is known as an antitoxin. If the patient can produce a sufficient amount of this antidote to the toxins before the vital organs are injured recovery occurs. If the toxin can be isolated from bacterial cultures and injected into men an artificial immunity can be produced.

The cellular elements of tissues also take an active part in the protection of the organism against various infections. The presence of any infection usually produces leucocytosis and bacteria in the tissues are surrounded by white cells or phagocytes which prevent the spread of bacteria destroying them.

If the reaction against invading bacteria is insufficient, vaccines may be injected subcutaneously to produce a more active resistance of the protective mechanisms of the body. Vaccines are employed not only to contribute to the treatment of a disease but to establish an active artificial immunity.

If the human body had not this capacity we would suffer from all infectious diseases.

Exercise 7. Answer the following questions:

1. What is the main cause of infectious diseases?
2. What specific capacity does the human organism have?
3. What are the two main types of immunity?
4. When do the microorganisms produce virulent poisons or toxins in the organism?
5. What specific substance do the cells of the body produce to meet the infection?
6. When can artificial immunity be produced?
7. What elements of the tissues also take an active part in the protection of the organism against the infection?
8. What is the main cause of leucocytosis?
9. Why are vaccines used?

Exercise 8. Match the words to make word-combination:

1. infectious	1. contact
2. growth of	2. protection
3. the human	3. infection
4. direct	4. antidote
5. resistance against	5. immunity
6. permanent	6. diseases
7. the characteristic	7. microorganisms
8. a chemical	8. organism
9. a sufficient	9. symptoms
10. artificial	10. amount

Exercise 9. Match the words with their definitions:

1. disease	a) an antibody that neutralizes a toxin;
------------	--

2. microorganism	b) a drug or agent that counteracts or neutralizes the effects of a poison;
3. infection	c) any organism, such as a bacterium, protozoan, or virus, of microscopic size
4. immunity	the ability of an organism to resist a disease;
5. antidote	d) any impairment of normal physiological function affecting an organism
6. antitoxin	a suspension of dead, attenuated (послаблений), or modified microorganisms for inoculation;
7. vaccine	e) is a pathogen's or microorganism's ability to cause damage to a host.
8. virulent poison	f) invasion of the body by pathogenic microorganisms.

Exercise 10. Fill in the blanks with the right word from the list below. You may use each word only once:

administer, after, antibodies, diseases, fight, generally, harmless, including, injected, orally, prevent, prevention, serums, smallpox, substances, symptoms, vaccines

Doctors use two main types of drugs for the of disease:

Vaccines contain dead or germs. They cause the body to develop called that act to disease. Doctors before a person has been exposed to such as poliomyelitis or Vaccines are usually but sometimes are given

Serums contain antibodies that off the germs of certain diseases, scarlet fever and lockjaw. These drugs are given a person has been exposed to the disease, or after of the disease have appeared. are administered by injection.

Exercise 11. Arrange the following statements in the correct order to explain the term “immunity”:

___ To function properly, an immune system must detect a wide variety of agents, known as pathogens.

___ Immunology is a science that studies the structure and function of the immune system.

___ Paul Ehrlich, Ilya Metchnikoff, Robert Koch are considered to be the main contributors to the development of immunology.

___ Immune system can be classified into the innate immune system versus the adaptive immune system, or humoral immunity versus cell-mediated immunity.

___ The immune system is a system of many biological structures and processes in an organism that protects against diseases.

Exercise 12. Arrange the following statements in the correct order to explain the term “vaccine”:

___ Vaccines can be prophylactic or therapeutic.

___ A vaccine is a biological preparation that provides active artificial immunity to a particular disease.

___ In order to provide best protection, children are recommended to receive vaccinations as soon as their immune systems are adequately developed to respond to certain vaccines. This has led to the development of vaccination schedules.

___ A vaccine agent stimulates the body’s immune system to recognize any pathological microorganisms, destroy them, and “remember”.

___ The administration of vaccines is called vaccination.

Exercise 13. Put the verb in brackets in the correct form (Conditional Sentences Type I):

1. If I see him, I (to give) him your report on the anatomy of the kidneys.
2. If he (to be) late for the anatomy lecture, he won’t know anything about the digestive system.

3. I'll be angry if he (to lose) my book "Urinary System".
4. If you (to come) late, the teacher (not to let) you in.
5. When I (to become) a gynecologist, I (to specialize) in the care, diagnosis, and treatment of the female reproductive system disorders.
6. Tell him to ring me up after pediatrics if you (to see) him.
7. I (to feel) really happy when I (to become) a successful doctor.
8. If the muscle (not to contract), the urine (not to be expelled) from the bladder.

Exercise 14. "If I were...". Finish the dreams of medical students matching the lines in the first column with the line in the second column.

1. If I were a pediatrician,	I would correct deformities of the skeletal system.
2. If I were an anesthesiologist,	I would help deliver babies.
3. If I were a gastroenterologist,	I would examine eyes and prescribe spectacles and contact lenses.
4. If I were a dentist,	I would deal with the diagnosis, treatment, and prevention of mental and emotional disorders.
5. If I were an ENT doctor,	I would diagnose and treat the diseases of the ear, nose, and throat.
6. If I were a psychiatrist,	I would specialize in the care of babies and children.
7. If I were an optician,	I would practise the prevention, diagnosis, and treatment of diseases, injuries, and malformations of teeth, jaws, and mouth.
8. If I were an obstetrician,	I would specialize in diseases of the stomach, intestines and associated organs.
9. If I were an orthopedist,	I would administer an anesthetic to a patient.

Exercise 15. Make up interrogative sentences to the underlined words:

1. All food consists of proteins, fats and carbohydrates.

2. Nervous tissue consists of nerve cells and nerve fibers.
3. The patient has lost 3 kilograms of weight this month.
4. Various specialists give medical consultations to patients at the polyclinic.
5. Brain coordinates the activity of the whole body.
6. The surgeon is making the limb immobile at the point of fracture at the moment.
7. The treatment has just been prolonged as the patient is still complaining of a general weakness.
8. Biologists discovered new kinds of microorganisms last month.
9. Students were dissecting a corpse for 1 hour yesterday.
10. If the infection is serious the patient will have to take strict preventive measures.

Self-check

I. Answer the questions:

1. What is the main cause of infectious diseases?
2. What are the two main types of immunity?
3. What specific substance do the cells of the body produce to meet the infection?
4. What elements of the tissues also take an active part in the protection of the organism against the infection?
5. Why are vaccines used?

II. Describe the terms:

Immunity, vaccine

MICROORGANISMS. VIROLOGY

Exercise 1. Key words:

nouns	verbs	adjectives/adverbs
algae	encompass	capable
archaea	prevalent	irregular
bacteria	replicate	lobed

fungi	responsible for	rectangular
habitat		rod
protozoa		salty
viruses		spherical
Yeast		spiral
		Visible

Exercise 2. Read the following paying attention to the rules of reading:

[əʃ] – filamentous, infectious, dangerous, numerous, previous, fibrous, nervous, various

[ə] – medium, fungus, nucleus, bacterium, asexual, archaeon, flagellum, spirillum, alga

[ə] – contain, consists, comprise, concern, control, correct, complete,

[s] – cocci, actinomycete, multicellular, absence, bacillus, mycelium, resistance, acid

[k] – coccus, cycling, nuclei, mitochondria, archaea, bacteria, actinomycete, microbe

Exercise 3. Remember:

Singular	Plural
alga	algae
archaeon	archaea
bacterium	bacteria
coccus	cocci
eukaryote	eukarya
flagellum	flagella
fungus	fungi
hypha	hyphae
medium	media
mitochondrion	mitochondria

nucleus	nuclei
protozoan	protozoa

Exercise 4. Read the text:

Microorganisms

A microorganism or microbe is any microscopic organism too small to be visible to the naked eye which may exist in its single-celled form or in a colony of cells (multicellular form). Microorganisms is an umbrella term used to encompass bacteria, yeast, fungi, and in some definition viruses. The classification is broad and includes both microorganisms that are capable of replication outside of any host and those that require a host to survive.

Microorganisms differ from each other not only in size, but also in structure, habitat, metabolism, and many other characteristics. The major groups of microorganisms – namely bacteria, archaea, fungi (yeasts and molds), algae and protozoa are usually found in each of the three domains of life: Archaea, Bacteria, and Eukarya. Microbes within the domains Bacteria and Archaea are all *prokaryotes* whereas microbes in the domain Eukarya are *eukaryotes*. Some microorganisms, such as viruses, do not fall within any of the three domains of life.

A **prokaryote** is a unicellular organism that lacks a membrane bound nucleus, mitochondria, or any other membrane-bound organelle. Prokaryotes are asexual, reproducing without fusion of gametes. The bacteria, archaea, mycoplasmas and actinomycetes are prokaryotes.

All **bacteria** are prokaryotic which have a variety of shapes, including spheres, rods, and spirals. Individual cells generally range in width from 0.5 to 5 micrometres (µm; millionths of a metre). Although unicellular, bacteria often appear in pairs, chains, **tetrads** (groups of four), or clusters. Some have flagella that propel the organism through liquid media; some have capsule, some produce spores. One of the major characteristics of bacteria is their reaction to the Gram stain. Some bacteria are gram-positive, taking on the stain's purple colour, whereas others are gram-negative.

Common shapes of bacteria include spherical (coccus), rod-shaped (bacillus), or curved (spirillum, spirochete, or vibrio).

Bacteria are usually found in nearly every habitat on earth, including within and on humans. Most bacteria are harmless or helpful, but some are **pathogens**, causing disease in humans and other animals.

Mollicutes is a class of bacteria distinguished by the absence of a cell wall. Mollicutes are parasites of various animals and plants, living on or in the host's cells.

Actinomycetales are an order of Actinobacteria. A member of the order is often called an **actinomycete**. Actinomycetales are generally gram-positive and anaerobic and have mycelium in a filamentous and branching growth pattern. Some actinobacteria can form rod- or coccoid-shaped forms.

Archaea constitute a domain of single-celled organisms. These microorganisms lack cell nuclei and are therefore prokaryotes. Unlike most bacteria, archaeal cell walls do not contain peptidoglycan, but their cell walls are often composed of a similar substance called pseudopeptidoglycan. Archaea are part of the microbiota of all organisms. In the human microbiota, they are important in the gut, mouth, and on the skin.

Eukaryotes are organisms whose cells have a nucleus enclosed within membranes, unlike which have no membrane-bound organelles. Eukaryotes belong to the domain **Eukaryota** or **Eukarya**. Eukaryotic cells typically contain other membrane-bound organelles such as mitochondria and the Golgi apparatus, and in addition, some cells of plants and algae contain chloroplasts. Unlike unicellular archaea and bacteria, eukaryotes may also be multicellular.

Eukaryotes can reproduce both asexually through mitosis and sexually through meiosis and gamete fusion. In mitosis, one cell divides to produce two genetically identical cells. In meiosis, DNA replication is followed by two rounds of cell division to produce four haploid daughter cells. The algae, fungi (yeasts and molds) and protozoa are eukaryotes.

Algae are eukaryotes and contain the green pigment chlorophyll, carry out photosynthesis, and have rigid cell walls. They normally occur in moist soil and

aquatic environments. These eukaryotes may be unicellular and microscopic in size or multicellular and up to 120 metres in length. Single-celled species may be spherical, rod-shaped, club-shaped, or spindle-shaped. Some are motile. Algae that are multicellular appear in a variety of forms and degrees of complexity.

Fungi are eukaryotic organisms that, like algae, have rigid cell walls and may be either unicellular or multicellular. Some may be microscopic in size, while others form much larger structures, such as mushrooms and bracket fungi that grow in soil. Unlike algae, fungi do not contain chlorophyll and thus cannot carry out photosynthesis. Fungi do not ingest food but must absorb dissolved nutrients from the environment.

Unicellular fungi – **yeasts** – are included within the study of microbiology. The unicellular yeasts have many forms from spherical to egg-shaped to filamentous. Some even cause diseases, such as vaginal yeast infections and oral thrush.

In **molds** cells are cylindrical in shape and are attached end to end to form threadlike filaments (hyphae) that may bear spores.

Some molds can cause allergies, and others produce disease-causing metabolites called mycotoxins. Molds have been used to make pharmaceuticals, including penicillin and cyclosporine, used to prevent organ rejection following a transplant.

Protozoa, or protozoans, are single-celled, eukaryotic microorganisms. Some protozoa are oval or spherical, others elongated. Some protozoa move with help from hair-like structures called cilia or whip-like structures called flagella.

Viruses are acellular microorganisms which are not composed of cells. Essentially, a virus consists of proteins and genetic material—either DNA or RNA, but never both—that are inert outside of a host organism. A virus is a sub-microscopic infectious agent that replicates only inside the living cells of an organism. They can infect all types of cells, from human cells to the cells of other microorganisms, including bacteria and archaea.

Multicellular parasitic worms called **helminthes** fall within the field of microbiology because diseases caused by helminthes involve microscopic eggs and **larvae**. The helminthes are characterized by elongated, flat or round bodies. In

medicine the flatworms or Platyhelminthes (platy from the Greek root meaning “flat”) include flukes and tapeworms. Roundworms are nematodes (nemato from the Greek root meaning “thread”). These groups are subdivided according to the host organ, e.g., lung flukes, extraintestinal tapeworms, and intestinal roundworms. Helminthes develop through egg, larval (juvenile), and adult stages.

Virology

Virology is the branch of science that studies viruses and virus-like agents. Viruses are small, subcellular agents that can't multiply outside a host cell. Viruses can infect all forms of life (bacteria, plants, protozoa, fungi, insects, fish, reptiles, birds, and mammals)

In 1892 Dimitri Ivanovski showed that tobacco mosaic disease could be transmitted by extracts that were passed through filters fine enough to exclude even the smallest known bacteria.

The existence of viruses that infect bacteria (bacteriophages) was first recognized by Frederick Twort in 1911, and, independently, by Felix d'Herelle in 1917. As bacteria could be grown easily in culture, this led to an explosion of virology research.

Since 1938 electron microscopy has made it possible to see virus particles, and since 1945 the possibility of preparing ultra fine microscopic sections has furthered the study of the development of the virus in tissues.

Now virology is the branch of medicine studying viruses and virus-like agents: their structure, classification and evolution, their ways to infect cells for virus reproduction, the diseases they cause, the techniques to isolate and culture them, and their use in research and therapy.

Virology is often considered to be a part of microbiology or of pathology.

A major branch of virology is virus classification. Viruses can be classified according to the host cell they infect: animal viruses, plant viruses, fungal viruses, and bacteriophages (viruses infecting bacteria, which include the most complex viruses).

The most widely used classification system distinguishes viruses according to the

type of nucleic acid they use as genetic material and the viral replication method they employ to coax host cells into producing more viruses:

- DNA viruses
- RNA viruses
- reverse transcribing viruses

In addition virologists also study "subviral particles": viroids, satellites and prions.

Viruses continue to be investigated because they are held to be possible causative agents of some human cancers. Viruses can have high rates of mutations that keep them undetectable.

Exercise 5. Answer the questions:

1. What is a microorganism?
2. What are the forms of microorganisms?
3. What is the classification of microorganisms and what microorganisms does it include?
4. What do microorganisms differ from each other?
5. What are the major groups of microorganisms?
6. What microorganisms do not fall within any of the three domains of life?
7. What unicellular organism do we call a prokaryote?
8. What shapes may all bacteria have?
9. What is the major characteristic of bacteria?
10. What bacteria are distinguished by the absence of a cell wall?
11. What is a Mollicute?
12. What are Actinomycetales?
13. What is the difference between bacteria and archaea?
14. What ability do many archaeans have like bacteria?
15. What is the main difference between eukaryotes and prokaryotes?
16. What microorganisms belong to eukaryotes?
17. What is the difference between algae and fungi?
18. What does a virus consist of?

19. What are the multicellular parasitic worms called?
20. What groups may helminthes be subdivided into?

Exercise 6. Look through the definitions and match them with the terms filling the table given below with the corresponding letters:

1. fungus	a. a bacterium of an order of typically non-motile filamentous forms. They include streptomycetes, and were formerly regarded as fungi;
2. virus	b. a simple, non-flowering, and typically aquatic plant of a large assemblage that includes the seaweeds and many single-celled forms. They contain chlorophyll but lack true stems, roots, leaves, and vascular tissue;
3. protozoan	c. a member of a large group of unicellular microorganisms which have cell walls but lack organelles and an organized nucleus, including some which can cause disease;
4. actinomycete	d. any of a group of unicellular, multicellular, or syncytial spore-producing organisms feeding on organic matter, including moulds, yeast, mushrooms, and toadstools;
5. bacterium	e. a single-celled microscopic animal of a group of phyla of the kingdom Protista, such as an amoeba, flagellate, ciliate, or sporozoan;
6. yeast	f. a microscopic single-celled organism which has neither a distinct nucleus with a membrane nor other specialized organelles, including the bacteria and cyanobacteria;
7. prokaryote	g. a microscopic fungus consisting of single oval cells that reproduce by budding, and capable of converting sugar into alcohol and carbon dioxide;
8. alga	h. an infective agent that typically consists of a nucleic acid molecule in a protein coat, is too small to be seen by light

	microscopy, and is able to multiply only within the living cells of a host.
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Exercise 7. Match the definition with the term:

viroids	viruses that affect plants. They are obligate intracellular parasites that do not have the molecular machinery to replicate without a host.
prions	small infectious pathogens composed of a short strand of circular, single-stranded RNA. Unlike viruses, they have no protein coating.
satellites	(fungal viruses/ Mycoviruses) are viruses that infect fungi.
animal viruses	subviral agents that differ from viroids because they depend on the presence of a helper virus for their propagation
plant viruses	a type of virus that infects bacteria and destroy their host cells
mycophages	(from Latin word that means poison) a submicroscopic infectious agent that replicates only inside the living cells of an organism.
bacteriophages	misfolded proteins that characterize several fatal and transmissible neurodegenerative diseases
virus	a small infectious agent that is unable to replicate outside a living animal cell

Exercise 8. Match the synonyms:

Transmit	slice
replication	infest
fatal	small
rate	reproduction
therapy	spread
fine	dreadful
infect	frequency

section	treatment
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Exercise 9. Insert the phrases in the following sentences.

bacteriophages, tobacco mosaic disease, existence of viruses, isolate, host-cell, histologic samples, DNA virus, viral replication, RNA virus, animal virus, fungal virus.

1. Some viruses (e.g., adenovirus) are difficult to ... and may require specific human cell lines for isolation.
2. Adolf Eduard Mayer was a German agricultural chemist whose work on ... played an important role in the discovery of tobacco mosaic virus and viruses in general.
3. Once the virus attaches to the ... and the viral genome is inserted into this cell, the viral infection has been initiated.
4. The disintegration or destruction of cells is the final step in a ... cycle in which the virus particles burst through the host cell membrane, rupturing the cell.
5. ... is a virus whose nucleic acid core is composed of DNA, such as any adenoviruses, herpesviruses, or poxviruses.
6. An ... is a virus that has ribonucleic acid as its genetic material.
7. The study of ... is important from a veterinary viewpoint and many of these **viruses** cause diseases that are economically devastating.
7. are found in most species of fungi, where they usually multiply without apparent harm to the host.
8. ... is a virus that reproduces itself in bacteria.
9. ... that pass through bacterial filters was first demonstrated in 1892 by D. I. Ivanovskii, who discovered the filterability of the causative agent of tobacco mosaic disease.
10. ... is a thin slice, as of tissue, suitable for microscopic examination.

Self-check

I. Answer the questions:

1. What are the major groups of microorganisms?
2. What unicellular organism do we call a prokaryote?
3. What is the major characteristic of bacteria?
4. What is the difference between bacteria and archaea?
6. What is the difference between algae and fungi?
7. What does a virus consist of?
8. What are the multicellular parasitic worms called?
9. What groups may helminthes be subdivided into?

II. Define the term: Microorganisms, eukaryotes, prokaryotes, algae, helminth

THE ORAL CAVITY. THE STRUCTURE OF THE ORAL CAVITY

Exercise 1. Key words:

verb	noun	Adjective
adapt	branch	
bound	fauces	alveolar
crush	jaw	anterior
grind	mandible	inferior
separate	maxilla	medial
	palate	palatine
	process	posterior
	ramus	separate

	slit	stationary
	socket	superior
	uvula	zygomatic
	vestibule	

Exercise 2. Link each *Verb* on the left with a *Noun* on the right to make 8 'partnerships'. The first one has been done for you as an example. Translate the given word combinations.

Verbs	Nouns
administer	antibodies
arrange	antibiotics
catch	the treatment
reveal	some infections
discontinue	an appointment
relieve	the pain
resist	a drug
prescribe	a cold

Exercise 3. Complete these sentences using the partnerships from Exercise II. You may have to make some changes to fit the grammar of the sentences. The first one has been done for you as an example.

1. As the severe side-effects appeared, **the doctor discontinued the treatment.**
2. As she was made a diagnosis of pneumonia, she was _____ .
3. The doctor _____ to the patient.
4. I've _____ from one of my colleagues at work.
5. The laboratory assistant _____ to hepatitis C in the patient's blood.
6. A healthy body can _____ .
7. I would like to _____ with the dentist for 10.00 am tomorrow.

8. She was given an injection to _____ in her leg.

Exercise 4. Some of the following words don't form adjectives with the help of suffixes. Try to form adjectives from the given nouns and translate them:

Model: *lung - pulmonary*

mouth -	membrane -	tongue -
liver -	stomach -	brain -
kidney -	tooth -	skull -
saliva -	lip -	alveolus -
nose -	cheek -	heart -

Exercise 5. Choose the words and phrases that don't go with the topic "The oral cavity":

Teeth, lips, tongue, maxilla, mandible, nasal cavity, abdominal cavity, thyroid gland, spinal cord, larynx, soft and hard palates, hypophysis, pharynx, skin, alveolar process, mucous membrane, salivary glands, pelvis cavity, uvula, pancreas, rami, breastbone, peritoneum, periodontal membrane, collarbone, renal pelvis.

Exercise 6. Read the text:

THE ORAL CAVITY

The oral cavity is a part of the body adapted for taking in food which is formed by the bones of the skull. It consists of the vestibule and the oral cavity proper. Inside there are two rows of teeth, one above the other, to grind and crush food into small pieces.

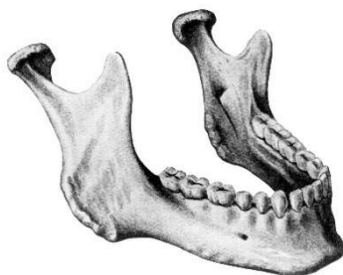
The vestibule of the mouth is a slit-like space bounded externally by the lips and cheeks, and internally by the teeth and alveolar processes, the jaws.

The human being has two jaws: an upper and a lower one.

The upper jaw (the maxilla) is stationary forming part of the skull. It is a paired bone. It consists of a body and four processes: the frontal, zygomatic, palatine, and alveolar processes. There are four surfaces of the body of the maxilla: the anterior, posterior, superior, and medial or nasal surfaces.



The lower jaw (the mandible) is the largest, strongest and lowest bone in the face. It is movable and attached to the skull by muscles. The mandible has a U-shaped form and consists of a body and two branches. The lower jaw is made up of two parts: the horse-shoe-shaped horizontal portion to which the teeth are attached and which is called "the body of the mandible" and the perpendicular part, the ramus. There are two rami, the left and the right.



The major portion of the structure, which makes up the jaw, is dense, hard bone but there is a part which is sponge-like in structure. This is called the alveolar process: and contains the sockets into which the roots of the teeth fit. The roots are held in place in sockets by a membrane, which is called the periodontal membrane.

The oral cavity proper is bounded superiorly by the hard or soft palates, inferiorly by the oral diaphragm, and anteriorly and laterally by the teeth and alveolar processes; posteriorly it communicates with the pharynx through the fauces. The alveolar process is a thickened ridge of bones of the maxilla and the mandible that contains tooth sockets (dental alveoli) in bones that hold teeth. The roof of the oral cavity consists of a bony front part, called the hard palate and a posterior soft part

called the soft palate. The hard palate separates the oral cavity from the nasal cavity. It is covered with the mucous membrane. The soft palate is situated posterior to the hard palate and separates the oral cavity from the pharynx. It is covered with a mucous membrane. The conical part of the soft palate situated along the medial line is called the uvula.

The structure of the oral cavity

The first section of the mouth is known as the oral cavity, or the mouth cavity. This space is bordered in the front and to the sides by the two alveolar arches, which contain the teeth.

The teeth are a group of hard organs in the oral cavity. The teeth are used to masticate food into tiny pieces. They also provide shape to the mouth and face and are important components in producing speech.

A tooth can be divided into two main parts: the crown and root. Found above the gum line, the crown is the enlarged region of the tooth involved in chewing. Below the gum line is the region of the tooth called the root, which anchors the tooth into a bony socket known as an alveolus. The narrowed part of a tooth between the crown and the root is called a neck. Each tooth is an organ consisting of three layers: the pulp, dentin and enamel.

The lips and cheeks contain the mimetic muscles: they are covered externally with the skin, and lined in the vestibule with the mucous membrane. The mucous membrane on the alveolar processes the jaw closely adheres to the periosteum and is called the gums (gingivae). Gingiva is the soft tissue that covers and protects the root of the tooth. The gum is not attached to the tooth. A red, moist, glistening tissue, which is called the mucous membrane or mucosa forms a protective covering for the tongue, palate, floor of the mouth and the inside of the lips and cheeks, much as the skin does for the rest of the body.

The tongue is a muscular organ covered with a mucous membrane. It consists of the tip, body and base. Underneath the tongue and the inner surface of the cheeks there are glands, three principal pairs being recognized: the sublingual, submandibular and parotid. One pair of glands, the parotid, is located in front of the

ears. Another pair, submandibular, is situated under the lower jaw. The third pair of glands is under the tongue and is known as the sublingual. They supply water, ferments and mucus to the food which is ground up by the teeth. Numerous small glands (labial, buccal, palatine and lingual) help producing saliva. Moreover, there are three pairs of large salivary glands whose ducts also open into the oral cavity. The secretion of the salivary glands is called saliva. Saliva breaks down starches that is the first step in digestion.

Exercise 7. Answer the following questions to the text.

1. What does the oral cavity consist of?
2. What is the function of the oral cavity?
3. What is the vestibule bounded by?
4. What is the maxilla?
5. What is the mandible?
6. What parts does the maxilla consist of?
7. How many processes does the maxilla have?
8. What does the mandible consist of?
9. What is an alveolar process?
10. How do the roots of the teeth held in place?
11. What is the hard palate and soft palate?
12. What part of the soft palate is called uvula?

Exercise 8. Say if the following statements are true or false. Correct the false statements to make them true.

1. Bones of the skull are flexible bones that form the oral cavity.
2. The vestibule of the mouth is a slit-like space bounded internally by the lips and cheeks.
3. The lower jaw (maxilla) is a paired stationary bone.
4. The hard palate separates the oral cavity from the nasal cavity.
5. The soft palate is placed to the inferior of the hard palate.

6. The fauces connect the oral cavity with the pharynx.
7. The upper jaw (the maxilla) is flexible and attached to the skull by muscles.
8. The roots are held in place in sockets by alveolar process.

Exercise 9. Match adjectives to the corresponding nouns to form word combinations.

Soft	membrane
Left	cavity
Alveolar	surface
Lower	cavity
Posterior	palate
Sponge-like	process
Periodontal	jaw
Oral	membrane
Nasal	structure
mucous	ramus

Exercise 10. Insert the words into the gaps in an appropriate part of speech:

1. Alveolar osteitis is _____ of _____ process of the upper or lower jaw that classically occurs as a postoperative _____ of tooth extraction.	Inflame, alveolus complicate
2. The _____ of first teeth usually starts at about six months.	erupt
3. The _____ of deciduous teeth starts inside the jaw before birth	develop Mucosa
4. _____ membrane produces mucus that prevents pathogens and dirt from entering the body and prevents bodily tissue from losing moisture.	periodontum
5. A tooth's root is attached to the jaw bone by _____	tooth

membrane that is somewhat elastic and allows for a limited amount of movement of the tooth in _____ <i>alveoli</i> .	open
6. The mouth is the facial _____ of the gastrointestinal tract.	tongue mouth, nose
7. The tongue is responsible for gustatory sense, which occurs via stimulation of the taste buds situated in the _____ papillae.	
8. The _____ cavity is separated from the _____ cavity by the palate.	

Exercise 11. Read the definitions and fill in the blanks with the words given below.

(Oral cavity, uvula, alveolar process, hard palate, mandible, tongue, fauces, mucous membrane)

1. ... is a thin horizontal bony plate located in the roof of the mouth.
- 2.... is the large bundle of skeletal muscles on the floor of the mouth that manipulates food for chewing and swallowing.
3. ... is the first portion of the alimentary canal that receives food.
4. The flexibility of this bone allows us to chew and talk....
5. ... A red, moist, glistening tissue, which is called ... forms a protective covering for the tongue, palate, floor of the mouth and the inside of the lips and cheeks, much as the skin does for the rest of the body.
6. ... is the conic projection from the posterior edge of the middle of the soft palate.
7. ... is a thick bony ridge that largely consists of sockets in which the teeth are embedded.
8. ... is the posterior part of the mouth, which leads into the pharynx.

Exercise 12. Put the words into the gaps in an appropriate part of speech:

<p>The _____ glands are exocrine glands that produce saliva through a system of ducts.</p> <p>You have three pairs of major salivary glands — parotid, sublingual and submandibular. Salivary glands make saliva, which aids in _____, _____ your mouth and supports healthy teeth. You have three pairs of major salivary glands under and behind your jaw — _____, sublingual and submandibular.</p> <p>There are about 1,000 minor salivary glands located throughout the oral cavity within the submucosa of the _____ mucosa in the tissue of the _____, _____, _____ mucosa, the soft palate, the lateral parts of the hard palate, and the floor of the mouth or between muscle fibers of the tongue.</p>	<p>Saliva</p> <p>digest</p> <p>Moist</p> <p>Ear</p> <p>Mouth</p> <p>Cheek, tongue, lip</p>
--	--

Exercise 13. Match the following terms with their definition:

1. saliva	a) a part of the tooth hidden in the jaw that keeps the tooth in place.							
2. a crown	b) a group of cells that secrete substances, lubricating the membrane and protect against infections							
3. an enamel	c) a part of the soft tissue lining of the mouth.							
4. a root	d) a part of the tooth visible in the mouth							
5. a tongue	e) a muscular organ that forms part of the floor of the oral cavity							
6. alveolar process	f) a small, calcified, whitish structure found in the jaws of many vertebrates and used to break down food.							
7. a tooth	g) a sticky fluid with colourless and watery appearance							
8. gingiva	h) the outer covering of the tooth that is the hardest tissue in the body							
9. mucous membrane	i) the thickened ridge of bone that contains the tooth sockets (dental alveoli) on bones that hold teeth.							
1	2	3	4	5	6	7	8	9

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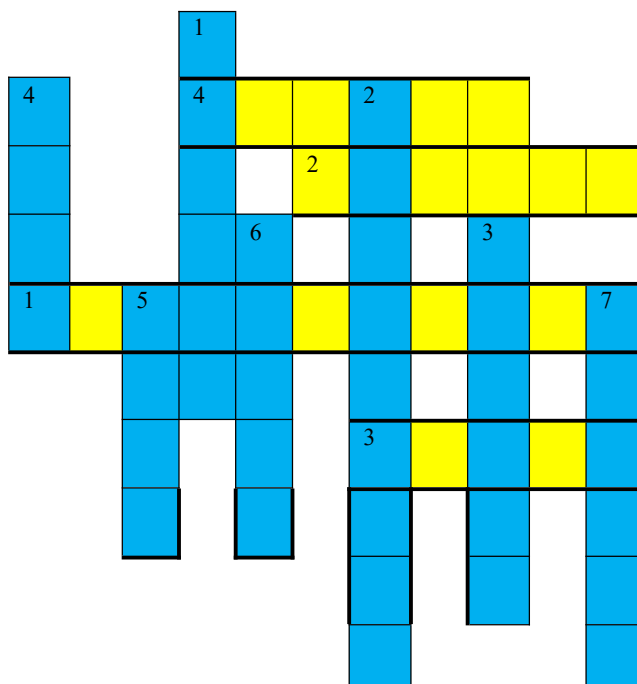
Exercise 10. Solve the puzzle:

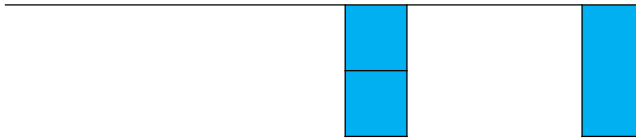
Down:

1. The inner structure of the tooth.
2. To grind or crush food with the teeth to prepare it for swallowing and digestion.
3. The synonym to mucous membrane.
4. The soft tissue forming the inner structure of a tooth and containing nerves and blood vessels.
5. The part of a tooth below the neck attached by the periodontal ligament to the alveolar bone.
6. Small bonelike structures of jaws for mastication of food.
7. The synonym to the word *gum*.

Across:

1. The tissue that surrounds bone.
2. Secretion of the salivary glands.
3. The portion of a human tooth that is visible above the gum line.
4. The white, compact, and very hard substance covering and protecting the dentin of the crown of a tooth.





Exercise 14. Match the beginning with the endings of the sentences:

1. teeth are used	a) a bony socket known as an alveolus.						
2. gingiva is the soft tissue that	b) in producing speech.						
3. glands supply water, ferments and mucus to	c) that lies over the mandible and maxilla inside the mouth.						
4. the root anchors the tooth into	d) a visible part of the tooth in the mouth.						
5. the mucous membrane or mucosa forms	e) covers and protects the root of the tooth.						
6. teeth are important components	f) the food which is ground up by the teeth.						
7. the gingiva consists of the mucosal tissue	g) a protective covering for the tongue, palate, etc.						
8. the crown of a tooth is	h) to masticate food into tiny pieces.						
1	2	3	4	5	6	7	8

Self-check

I. Answer the questions:

1. What does the oral cavity consist of?
2. What is the maxilla?
3. What is the mandible?
4. What parts does the maxilla consist of?
5. What does the mandible consist of?

6. What is an alveolar process?
7. How do the roots of the teeth held in place?
8. What is the hard palate and soft palate?
9. What is the function of the oral cavity?

II. Define the terms: oral cavity, maxilla, mandible, alveolar process

ANATOMY OF A TOOTH

Exercise 1. Key words.

verb	noun	adjective
decay	apex	interior
drill	angle	rod
repair	bundle	sensitive
undergo	decay	solid
	foramen	visible
	junction	
	nourishment	
	odontoblast	
	repair	

Exercise 2. Memorize the formation of plural forms of medical terms.

<i>Singular endings</i>	<i>Plural endings</i>	<i>Examples</i>	
		<i>singular</i>	<i>plural</i>
a	ae	vertebra	vertebrae
en	ina	lumen	lumina
um	a	septum	septa

us	i	fungus	fungi
ex, ix	ices	index	indices

Exercise 3. Find the right plural form of the noun:

bacillus	bacilli	bacilluses
maxilla	maxillas	maxillae
ramus	ramia	rami
bacterium	bacteri	bacteria
alveolus	alveolei	alveoli
gingiva	gingivae	gingivas
root	roots	rootae
apex	apecis	apices
coccus	cocci	coccae
foramen	foramina	forameni

Exercise 4. Read the text.

ANATOMY OF A TOOTH

Every tooth consists of a crown, a neck and one or more roots. The crown is the part visible in the mouth and the root is the part hidden inside the jaw. The junction of crown and root is called the neck and the end of the root is called the apex. Every tooth is composed of enamel, dentine, cementum and pulp.

Enamel. This is the outer covering of the crown and is the hardest substance in the body. It is insensitive to pain. Unlike most other body tissues it cannot undergo repair; thus any damage caused by decay or injury is permanent. The microscope shows that it consists of long solid rods, called enamel prisms, cemented together by the interprismatic substance. The prisms run roughly at right angles to the surface.

Dentine. It is situated under enamel and occupies the interior of the crown and root. It is very sensitive to pain. It is attacked by caries when the protective enamel has been lost. Dentine from elephants' tusks is commonly known as ivory but is exactly the same dentine as that found in human teeth.

Cementum. This is the outer covering of the root and is similar in structure to bone. Cementum meets enamel at the neck of the tooth.

Pulp. Pulp is the most vital part of the tooth. Unlike enamel, dentine and cementum, the pulp is purely soft tissue. It contains blood vessels and nerves, and occupies the center of the dentine. The pulp has two parts: the pulp chamber and the root canal. Vessels and nerves of the pulp enter the root apex through the apical foramen and pass up the root canal into the crown, where the space occupied by the pulp is called the pulp chamber. The nerves of the pulp are responsible for pain felt when dentine is drilled or toothache occurs. Pulp acts as a security and alarm system for a tooth. Odontoblasts make up the outmost layer of the pulp. The pulp has several functions, such as:

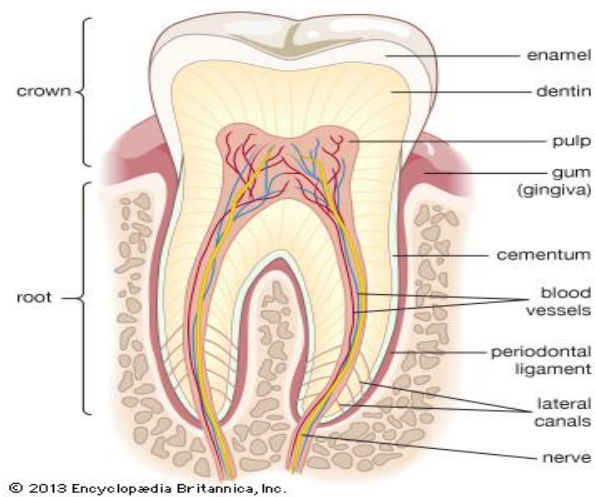
Sensory Function - Pain from trauma to pulp, differences in temperature, and pressure are caused by stimulation of the pulp.

Formation of Dentin - The pulp is responsible for the formation of dentin. In response to trauma, the pulp forms secondary dentin.

Nourishment - The pulp contains blood vessels that transport nutrients to the roots of the teeth.

Supporting Structures. Every tooth is inserted into the jaw by its root. The part of the jaw containing the teeth is known as the alveolar process and is covered with a soft tissue called gingiva. The jaw bones consist of a dense outer layer known as compact bone and a softer interior called spongy bone.

A tooth is attached to its socket in the jaw by a soft fibrous tissue called the periodontal membrane. It acts as a shock absorber and is attached to the cementum of the root and the compact bone lining the socket. The periodontal membrane contains nerves and blood vessels, but consists mainly of bundles of fibers which pass obliquely from cementum to bone.



Exercise 6. Answer the questions to the text.

1. What parts does a tooth consist of?
2. How is the junction of crown and root called?
3. What layers is a tooth composed of?
4. What layer of the tooth called is called *the enamel*?
5. What is the hardest substance in the body insensitive to pain?
6. What does enamel consist of?
7. What part is called the neck of the tooth?
8. What is cementum of the tooth?
9. What layer of the tooth is sensitive to pain?
10. What is the pulp of the tooth?
11. What parts does the pulp consist of?
12. Why is the pulp very sensitive to pain?
13. What is the outmost layer of the pulp called?
14. What is the pulp chamber?
15. What are the functions of the pulp?
16. What supporting structures can you name?
17. What types of bones does each jaw consist of?

Exercise 7. Decide whether the following statements are true or false.

1. Enamel is very painful part of the tooth.

2. Gingiva holds the root in the socket in the jaw.
3. A small, calcified, whitish structure found in the jaws and used to break down food is known as crown.
4. Odontoblast is a part of the outer surface of the dental pulp beneath the tooth enamel on the crown and the cementum on the root.
5. Blood vessels and nerves enter the root apex through the apical foramen.
6. The lower teeth set in a movable foundation called mandible.
7. Enamel has white but transparent structure.
8. The tooth sockets are covered with hard ivory tissue called the gum.

Exercise 8. Match the dental terms in the column A with those from the column B to form collocations.

A	B
pulp	apex
tooth	rami
mucous	bone
compact	jaw
spongy	socket
masticatory	canal
periodontal	bone
root	surface
apical	cavity
root	ligament
oral	foramen
alveolar	membrane
right and left	chamber
periodontal	process
movable	membrane

Exercise 9. Match the words with their definitions.

1. tooth	a) It is a thin layer of bonelike material covering the root of a tooth.
2. roots	b) A part of the tooth above the gums.
3. enamel	c) It is a yellowish tissue that makes up the bulk of all teeth. It is
4. cementum	harder than bone but softer than enamel. Sensitivity to pain, pressure, and temperature is transmitted through it.
5. dentin	d) It makes up a visible part of the tooth, covering the crown. It is
6. pulp	the hardest substance in the human body.
7. crown	e) It is the thickened ridge of bone that contains the tooth sockets
8. alveolar process	on bones that hold teeth. f) They are normally buried in the jaw, and they serve to anchor the tooth in position. g) It is the part in the center of a tooth made up of living connective tissue and cells called odontoblasts. h) Each of a set of hard, bony enamel-coated structures in the jaws of most vertebrates, used for biting and chewing.

Exercise 10. Put the words in italics in an appropriate part of speech:

1. _____ to pain increases when the tooth is drilled.	<i>Sensitive</i>
2. Bone tissue consists of cortical bone and _____ bone.	<i>sponge</i>
3. The _____ at the apex of the root of a tooth gives passage to the nerve and blood vessels.	<i>open</i>
4. The cavity in the tooth can undergo <i>repair</i> by _____.	<i>fill</i>
5. _____ is possible by _____ of the lower teeth against the upper.	<i>masticate,</i> <i>move</i>
6. _____ of the pulp is provided by blood vessels inside the root canal.	<i>nourish</i> <i>attach</i>
7. The _____ of the tooth in a tooth socket is formed by the periodontal membrane.	<i>gum</i>
8. A crevice between the tooth surface and the gum margin is called _____ sulcus.	

Exercise 11. Complete the sentences with the words from the box:

a pulp, a crown, an enamel, a root, an alveolar process, an odontoblast, a dentin, a cementum

1. The thickened ridge of bone that contains the tooth sockets (dental alveoli) on bones that hold teeth is called _____.
2. A protective layer of bone-like tissue called _____ covers the dentin of the root and blends with the fibers of the periodontal membrane.
3. _____ is a part of the tooth visible in the mouth.
4. _____ is composed of calcified connective tissue that is very sensitive to pain.
5. _____ is a part in the center of a tooth made up of living connective tissue and cells called odontoblasts.
6. _____ is the outer covering of the tooth that is the hardest tissue in the body.
7. A part of the tooth hidden in the jaw that keeps the tooth in place is called _____.
8. _____ is part of the outer surface of the dental pulp that takes active part in the formation of dentin.

Exercise 12. Write down synonyms to the given words.

A cancellous bone, oral mucosa, a cortical bone, an upper jaw, a lower jaw, a dental process, a dental alveolus, a gum, a periodontal ligament, dentinal cell.

Exercise 13. Substitute the words given in *italics* with their synonyms:

1. *A periodontal ligament* surrounds the root of the tooth and holds the root in *the dental alveolus*.
2. *A cancellous bone* is typically found at the ends of long bones, proximal to joints and within the interior of the vertebrae.
 1. *A cortical bone* forms the cortex, or outer shell, of most bones.
 2. *The gum* is composed of dense fibrous tissue and is covered by *oral mucosa*.

3. *The upper jaw* includes the hard palates of the mouth that separates the oral cavity from the nasal one.
4. The skull can be subdivided into two parts: the cranium and *the lower jaw*.
5. *The dental process* is a portion of the jaw that forms the dental arch and supports the teeth.
6. *Dental alveolus* is an opening into each jaw where each tooth fits and is attached by means of the periodontal ligament.

Exercise 14. Insert prepositions or adverbs.

1. Every tooth consists ... a crown and one or more roots.
2. Any damage caused... decay or injury is permanent.
3. They are cemented together... the interprismatic substance.
4. The prisms run roughly... right angles... the surface.
5. Dentine occupies the interior... the crown and root.
6. Vessels and nerves of the pulp pass... the root canal... the crown.
7. A tooth is inserted... the jaw... its root.
8. Any tooth is attached... its socket... the jaw... the periodontal membrane

Exercise 15. Ask questions to the underlined words.

1. The roots of the teeth are hidden inside the jaw.
2. The microscope shows that it consists of long solid rods.
3. Cementum meets enamel at the neck of the tooth.
4. As there was an extensive decay, dentine was very sensitive to pain.
5. The dentist drilled the tooth.
6. The outermost layer of the pulp must be lined with the special cells.
7. The alveolar process is covered with gum.
8. Periodontal membrane acts as a shock absorber.

Exercise 16. Open the brackets and put the verbs in a correct form. Translate the sentences.

1. The dental pulp (to fill) with soft connective tissue.

2. Enamel of the 1st molar already (to destroy) by caries.
3. If you drink a lot of tea or coffee, the colour of your teeth (to change).
4. The patient (to have to visit) a dentist because of a severe toothache.
5. As the tooth is severely destroyed, the dentist (to extract) it as soon as possible.
6. Cementum (to serve) as a medium by which the periodontal ligament can attach to the tooth for stability.
7. In 1685 Charles Allen (to write) the 1st dental textbook “Operator for the teeth”.
8. A test on the tooth structure (to write) by dental students next Monday.

Exercise 17 . Describe the terms according to the plan: *cementum, pulp, dentin, enamel*.

Plan:

1. Tell what the term means.
2. Tell what the given organ consists of.
3. Tell about its functions.
4. Give any other information you know about the given organ.

Self-check

I. Answer the questions:

1. What parts does a tooth consist of?
2. How is the junction of crown and root called?
3. What layers is a tooth composed of?
4. What layer of the tooth is called *the enamel*?
5. What types of bones does each jaw consist of?
6. What does enamel consist of?
7. What part is called the neck of the tooth?
8. What is cementum of the tooth?
9. What is the pulp of the tooth?
10. What parts does the pulp consist of?
11. What are the functions of the pulp?
12. What is the outmost layer of the pulp called?

13. What is the pulp chamber?

II. Define the terms: dentin, cementum, enamel, the pulp, the crown of the tooth, the root

TYPES OF TEETH

Exercise 1. Key words:

verb	noun	adjective
affect	ancestor	bulbous
erupt	canine	chisel-shaped
fuse	counterpart	deciduous
grind	cuspid	divergent
	dentition	impacted
	gripping	mesial
	incisor	oblique
	ridge	rudimentary

Exercise 2. Give adjectives to the nouns used in dentistry:

Model: *lung – pulmonary*

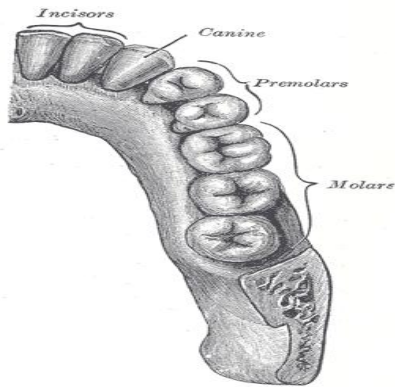
cheek –	tongue -	middle -
palate –	mouth –	side -
tooth -	tongue –	lip -
gum -	alveolus –	neck -

Exercise 3. Read the text:

TYPES OF TEETH

Depending on the form and function our teeth are divided into 4 groups. They are incisors (used for biting), canines (cuspids) that are used for gripping, premolars and molars which are used for chewing (mastication). The clinical formula of teeth is the following: 2 incisors, 1 cuspid, 2 premolars and 3 molars.

Wisdom teeth, also known as third molars, are the last set of teeth to erupt in your mouth. These teeth are rudimentary third molars that helped human ancestors to grind plants. This generally occurs between the ages 17 and 25, a time of life that has been called the “Age of Wisdom”. Wisdom teeth commonly affect other teeth as they develop, becoming impacted so they are often extracted even before this occurs.



Incisors have one root and chisel-shaped crowns. The upper crowns are much wider than their lower counterparts.

The upper lateral incisor crown is smaller than the upper central; the lower lateral crown is slightly larger than the lower central. They have large conical crowns and one long root. Canines are relatively long, pointed teeth that are situated between the incisors and the premolars. The upper canine is larger than the lower one and has the longest root of the whole dentition.

The upper first premolar has two roots, one buccal and one palatal. The remaining premolars have one root. Each premolar has two cusps, one buccal and one palatal or lingual that is why they are also called bicuspid.

The cusps of upper premolars are much bigger than lowers and are almost equal in size. The lingual cusp of lower premolars is much smaller than the buccal cusp.

Upper molars have three roots, two buccal and one palatal. The buccal roots are mesial and distal. Lower molars have four cusps, two buccal and two palatal. Their crowns are characterized by an oblique ridge which runs from the mesio-palatal cusp to the disto-buccal cusp. Upper first molars often have an extra cusp on their mesio-palatal surface.

Lower first molars have five cusps, three buccal and two lingual. Lower second molars have four cusps, two buccal and two lingual.

First molars are the largest teeth of all. Third molars are very variable in size and number of roots and cusps. Usually they are the smallest molars and their roots are frequently fused together.

Deciduous molars are like miniature permanent molars. They have the same number of roots but their crowns are much whiter and more bulbous than permanent ones. To provide space for the developing premolars, the roots of deciduous molars are more divergent than those of permanent molars.

Exercise 4. Answer the questions to the text:

1. What groups are the teeth divided into according to their form and function?
2. What is the function of incisors?
3. What function do cuspids perform?
4. What types of teeth are used for mastication or chewing?
5. How many roots do incisors have?
6. What tooth has the longest root in the whole dentition?
7. How many roots does the upper 1st premolar have?
8. What teeth have three roots?
9. How many roots do molars have?
7. How do the roots of deciduous teeth look like?
8. Roots of what teeth are frequently fused together?
9. What teeth are called wisdom teeth?
10. What is the clinical formula of the teeth?

Exercise 5. Exercise 6. Find the terms denoting parts and types of teeth in the following:

1. iengumscarve	a) Firm tissue around the base of the teeth
2. wisrootstooth	b) it is covered with a thin layer of bone, and it is inserted
3. canimolarpid	into sockets in the bone of the jaw.
4. bipremolarce	c) a tooth with at least 3 roots and a large crown.
5. setdentitionte	d) it is located between the canine and the molar. It has at
6. cawisdomrot	least two cusps.
tooth	e) set of teeth
7. tisincisormty	f) a tooth that erupts between 14 and 25 years.
8. semcaninepy	g) A narrow-edged tooth at the front of the mouth, adapted
	for cutting. In humans there are four of these teeth in each
	jaw.
	h) a tooth having one point and the longest root.

Exercise 7. Say whether the following statements are true or false:

1. The eruption of wisdom teeth varies among individuals.
2. Teeth, used for biting, are called canines.
3. Incisors have more than 2 roots.
4. Flattened chisel-shaped crowns cover the cuspid.
5. Each premolar has two cusps, one buccal and one palatal or lingual.
6. The teeth of a grown-up are divided into 4 groups according to the form and function.
7. First molars are the largest teeth of all.
8. Teeth, used for gripping, are called molars.

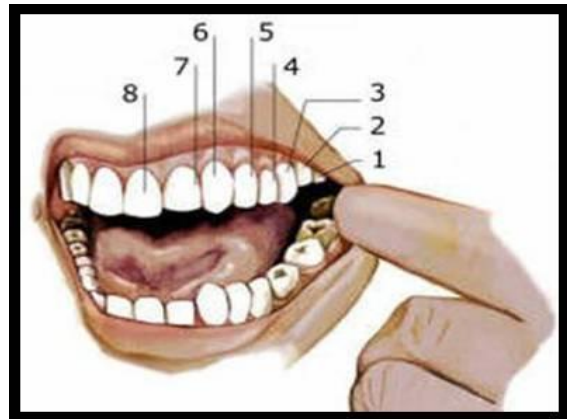
Exercise 8. Fill in the table with appropriate parts of speech:

verb	noun	Adjective/participle
erupt		
		variable
	impaction	
masticate		
	division	

		sensitive
replace		
		delivered
eliminate		

Exercise 9. Write down the names of the teeth:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____



Exercise 10. Form an appropriate part of speech from the words in italics:

1. The dental surgeon took the forceps for the _____ of wisdom teeth.	<i>Extract</i>
2. The formation of an adult dentition usually completes after the _____ of four third molars.	<i>Erupt</i>
3. The broken canine in this patient can be replaced by an _____ tooth.	<i>Art</i>
4. Premolars are considered as 'transitional teeth' during _____.	<i>Masticate</i>
5. Wisdom teeth have more _____ than other teeth because they have to compete for the room in the jaw.	<i>Complicate</i>
6. Wisdom teeth that erupt beneath dentures often cause severe _____ and should be removed.	<i>Irritate</i>
	<i>Remove</i>
	<i>Chemistry,</i>

7. _____ of teeth is usually performed under local anesthesia.	<i>tooth</i>
8. Erosion is a _____ wearing away of the _____ structure without bacterial function.	

Exercise 11. Find synonyms to the given words in the text and translate them into your native language:

A tricuspid tooth, a cuspid, a bicuspid, a set of teeth, milk teeth, a front tooth, the third molar, secondary teeth.

Exercise 12. Insert the words with their synonyms from exercise 11 into the gaps:

- _____ consists of 32 teeth and start to erupt after the age of 6.
- Upper _____ are also known as eyeteeth and are used for biting and tearing food.
- _____ is a front tooth with one root used for biting food.
- _____ are the last teeth in the oral cavity that sometimes fail to erupt causing serious complications.
- _____ got their another name because they have 2 cusps.
- _____ may have from 3 to 5 cusps that is why they are called so, especially the 1st molar.
- _____ begin to erupt at about the age of 6 months.
- There are usually 20 teeth in _____ of a child.

Exercise 13. Read the text about wisdom teeth problems and insert prepositions from the box:

On, to, for x3, between, under, in

Wisdom teeth can lead _____ problems if there isn't enough space _____ them or they grow in the wrong position. If your wisdom teeth are impacted, they are trapped in your jaw or _____ your gums.

Wisdom teeth that aren't _____ the right position can trap the food. That gives cavity-causing bacteria a place to grow.

Wisdom teeth that haven't come in properly, which can make it difficult to floss the _____ wisdom teeth and the molars next to them.

Wisdom teeth that have partially come through can give bacteria a place to enter the gums and create a place _____ infection to occur. This may also lead to pain, swelling and stiffness in your jaw.

Wisdom teeth that don't have room _____ eruption can damage neighboring teeth.

An impacted wisdom tooth can form a cyst _____ the impacted tooth. This could damage the roots of nearby teeth or destroy the bone that supports your teeth.

Exercise 14. Open the brackets and put the verbs in a correct form. Translate the sentences:

1. The permanent set of teeth with wisdom tooth usually (to complete) at 25 years.
2. A total number of teeth (to vary) among individuals.
3. Last class the students (to spend) much time studying the structure of the teeth.
4. The dentist (to examine) the child teeth when the nurse entered the room.
5. The baby (to lose) already his 1st deciduous tooth.
6. If proper oral hygiene doesn't help to cope with gum disease, medical treatment (to use).
7. The wisdom tooth just (to extract) because of severe inflammation.
8. The nurse (to clean) the room before the dentist came in.

Exercise 15. Put questions to underlined words:

1. The permanent teeth replace the temporary ones.
2. The dentist determined the reason of the terrible toothache.
3. The gums should be brushed with a soft tooth-brush and antiseptic tooth paste.
4. Teeth malformation will be caused by poor jaw development.
5. The eruption of permanent teeth has been completed by the age of 15.
6. Two central incisors in the lower jaw were the 1st teeth to erupt.
7. In some cases wisdom teeth don't develop at all.

8. The professor was delivering a lecture during 2 hours.

Exercise 16. Describe the terms according to the plan: molars, incisors, premolars, canines, wisdom teeth

Plan:

1. Tell what the term means.
2. Tell about its functions.
3. Give any other information you know about the given organ.

Self-check

I. Answer the questions:

1. What groups are the teeth divided into according to their form and function?
2. What is the function of incisors?
3. What function do cuspids perform?
4. What types of teeth are used for mastication or chewing?
5. How many roots do incisors have?
6. What tooth has the longest root in the whole dentition?
7. What teeth have three roots?
8. How many roots do molars have?
9. What teeth are called *wisdom teeth*?
7. What is the clinical formula of the teeth?

II. Define the terms: molars, incisors, premolars, canines, wisdom teeth

EXAMINATION OF THE PATIENT

Exercise 1. Key words:

verb	noun	adjective
apply	accumulation	abnormal
confirm	breathlessness	facial
estimate	cough	mental
determine	dizziness	oral
include	edema	visual
monitor	fissure	
reveal	fracture	
	haemorrhage	
	headache	
	height	
	murmur	
	palpation	
	percussion	
	rales	
	sputum	
	swelling	

Exercise 2. Read correctly:

ture [ʃə]: picture, fracture, nature, mixture, lecture, culture, fixture, creature, temperature;

sure [ʒə]: pleasure, measure, treasure, exposure, seizure, BUT **ssure** [ʃə]: pressure;

(t)ch [tʃ]: chill, chest, chin, cheek, each, much, rich, cheese, torch, touch, match, kitchen;

ch [k]: mechanism, headache, chemistry, stomach, character, technique, scheme, school;

g [g]: gain, gossip, gullet, flag, groin, gold, good, beg, glad, gall-bladder, gut;

g [dʒ]: gem, gin, gym, stage, age, gel, luggage, damage, image, genesis, cage;

BUT g [g]: gift, girl, get, give.

Exercise 3. a) Form the nouns with the term-elements. Explain the meaning of term-elements.

a) form the nouns with the term-element *-ache*: head, ear, stomach, back, tooth, arm;

b) form the nouns with the term-element *patho-*: genesis, biology, biochemistry, anatomy, metabolism, occlusion, physiology;

c) form the nouns with the term-element *haemo-*: capillary, diagnosis, dynamics, globin, dialysis, angioma.

Exercise 4. Read the text:

Examination of the Patient

Before treating the patient, it is necessary to make a correct diagnosis of the disease and to determine its aetiology, i.e. the causes of the disease. The examining doctor must know well the pathogenesis of any disease, i.e. the way and mechanism of its development, as well as the symptoms revealing it.

A number of different procedures is used to establish a diagnosis: history-taking; physical examination, which includes visual examination, palpation, percussion, auscultation; laboratory studies, consisting of urinalysis, blood, sputum and other analyses; instrumental studies, for example, taking electrocardiograms or cystoscopy, X-ray examination and others.

For determining a disease, it is very important to know its symptoms, i.e. the signs of a disease. They are breathlessness, edema, cough, chill, vomiting, fever, haemorrhage, headache, rash, swelling and others. Some of these symptoms are objective, e.g., haemorrhage or vomiting, because they are determined by objective study, while others, such as headache or dizziness are subjective, since they are evident only to the patient.

The physical examination includes three stages: general examination; local examination; examination of body systems.

On general examination, the patient is examined from head to toes: this helps to

estimate the physical and mental state of the patient. The doctor also determines the patient's weight and height, observes his facial expression, movements, speech, state of lymphatic nodes, muscles, bones, joints.

On local examination, the doctor examines the patient's head, eyes, nose, ears, oral cavity, neck, thyroid gland, etc. to estimate the functional state of particular parts of the body.

Examination of body systems includes the study of the respiratory, endocrine, nervous and other systems. On this stage, the doctor applies the technique of palpation and percussion to determine whether the borders of internal organs are normal or abnormal. By means of auscultation he can reveal rales in the lungs in case of pneumonia or bronchitis, or heart murmurs if a patient suffers from cardio-vascular diseases.

Laboratory analyses are important as well. Blood analysis revealing leukocytosis immediately indicates the presence of inflammation in the body. Urinalyses help to reveal the presence of urinary tract infections such as cystitis, nephritis or pyelonephritis. Analysis of sputum is performed to confirm the diagnosis of tuberculosis.

Instrumental procedures also help to determine health problems. Electrocardiograms are necessary to monitor the heart work. X-ray usually shows the borders and structure of the internal organs, fractures and fissures, accumulation of liquid in the lungs, etc.

So, examination of the patient is a complex procedure helping to timely reveal diseases or dysfunctions of any organs and start their treatment.

Exercise 5. Answer the questions:

1. What is it necessary to know to make a correct diagnosis?
2. What kind of procedures are used to establish a diagnosis?
3. What groups can symptoms be divided into?
4. What is the difference between the objective and subjective symptoms?

5. What does the scheme of the physical examination include?
6. What is examined during each stage of physical examination?
7. Why are laboratory analyses important?
8. What does X-ray help to reveal?

Exercise 6. Match the symptoms to their explanations:

1. haemorrhage	a) small red spots on the skin
2. cough	b) removal of the contents of the stomach
3. headache	c) feeling of coldness during high fever
4. rash	d) pain in the head
5. fever	e) profuse bleeding from injured blood vessels
6. vomiting	f) accumulation of fluid under the skin or in the body cavities
7. chill	g) high body temperature
8. edema	h) reflex which helps to remove foreign substances and microbes from the airways

Exercise 7. Fill in with the necessary information from the text:

1. The cause of the disease is known as _____.
2. The physical examination includes the following procedures _____.
3. The pathogenesis is known as _____.
4. The instrumental studies may include _____.
5. The laboratory studies consist of _____.
6. To make a diagnosis the doctor should make the following procedures _____.
7. Three stages of physical examination are: _____.
8. The signs of a disease is known as _____.

Exercise 8. Complete the table according to the information from the text:

Physical examination	Laboratory examination	Instrumental examination

Exercise 9. Fill in the sentences with the words from the box:

urinalyses, history-taking, subjective, X-ray, palpation, laboratory, symptom, objective

1. Typical signs that can characterize particular disease are called _____.
2. Blood tests and sputum analyses are performed during _____ examination.
3. Haemorrhage, rash, cough are _____ symptom.
4. Breathlessness, dizziness are _____ symptom.
5. The fracture of bones can be revealed by _____.
6. _____ is the first step in patient's examination.
7. _____ is performed to determine to borders of internal organs.
8. The doctors usually administer _____ to reveal urinary tract infections.

Exercise 10. Complete the table:

verb	noun	Adjective/participle II
---	mind	
To examine		
		indicated
	confirmation	
		accumulated
reveal		
		applied

vomit		-----
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Exercise 11. Remember:

The suffix – *itis* from Latin denotes inflammation

e.g. gastritis – inflammation of the stomach

Explain the terms:

Cystitis, nephritis, pyelonephritis, hepatitis, arthritis, colitis, dermatitis, gingivitis, parotitis, tonsillitis, cholecystitis, otitis, glossitis

Exercise 12. Match the synonyms:

dizziness	coldness
swelling	eruption
haemorrhage	Accelerated heart rate
vomiting	retching
rash	edema
rupture	bleeding
dyspnoe	vertigo
chill	Breathlessness
nausea	burst
palpitation	emesis

Exercise 13. Insert the words from ex.12:

1. _____ is a term used to describe a range of sensations, such as feeling faint, woozy, weak or unsteady.
2. _____ is caused by excess fluid trapped in your body's tissues. It can affect any part of your body mostly in the hands, arms, feet, ankles and legs.
3. _____ is a large flow of blood from a damaged blood vessel.
4. _____ is the act of emptying the contents of the stomach through the mouth.

5. _____ is difficulty in breathing and the feeling of not getting enough air.
6. _____ is a diffuse sensation of unease and discomfort, often perceived as an urge to vomit.
7. _____ is a feeling of a fast-beating, fluttering or pounding heart. Stress, exercise, medication or, rarely, a medical condition can trigger it.
8. _____ is a change of the human skin which affects its color, appearance, or texture.

Exercise 14. Put the verbs in brackets into the correct tense form. Translate the sentences into Ukrainian:

1. The cause of the disease (to call) aetiology.
2. Yesterday the students (to learn) the pathogenesis of pneumonia.
3. Tomorrow I (to take) the ECG to monitor my heart work.
4. If blood analysis (to reveal) leukocytosis, the patient (to administer) antibiotics.
5. The medical examination (to carry) out twice a year, as a rule.
6. The stomach troubles of the patient (to determine) by vomiting.
7. In a week, students (to observe) the professor examine his patients.
8. Good day light (to allow) to estimate the colour of the patient's skin, conjunctiva, oral cavity.

Exercise 15. Put questions to the underlined words:

1. To make a diagnosis the doctor needs the findings of blood analysis.
2. Any disease is usually revealed by its symptoms.
3. The patient was administered unanalysis to confirm cystitis.
4. Objective symptoms include haemorrhage, vomiting, cough, etc.
5. She felt dizzy and nauseous after taking these pills.
6. Physical examination is the first objective stage in examination of a patient.
7. By means of auscultation the examiner can reveal rales in the lungs and heart murmurs.

8. The diagnosis of tuberculosis will be confirmed after analysis of sputum.

Self-check

I. Answer the questions:

1. What is it necessary to know to make a correct diagnosis?
2. What procedures are used to establish a diagnosis?
3. What is the difference between the objective and subjective symptoms?
4. What does the physical examination include?
5. Why are laboratory analyses important?
6. What does X-ray help to reveal?

II. Define the terms:

Physical examination, a symptom

AT THE DENTIST'S

Exercise 1. Key words:

verb	noun	adjective
cleanse	appliance	crooked
deaden	brace (wire)	loose
drill	bridge	neglected
extract	dental mechanic	
fill	filling	
undergo	inspection	

Exercise 2. Write a word for a specialist in each of the following fields.

Field	Specialist	Field	Specialist
<i>dentistry</i>	<i>dentist</i>	psychiatry	
ophthalmology.		neurology	
specialty		cardiology	
orthodontics		dermatology	
prosthetics		gynecology	
endocrinology		venerology	

Exercise 3. Practice the pronunciation of the following words and word combinations.

Dental inspection, orthodontics, to consult a dentist, to drill, to reveal a cavity, to put in a filling or to fill the cavity, neglected teeth, to extract a tooth, to apply some anesthetic, to deaden the pain, teeth become loose, prosthetic dentistry department, dentures, bridges, crowns, dental mechanic, appliance according to the given design, straighten teeth, crooked teeth.

Exercise 4. Read the text.

AT THE DENTIST'S

Every citizen of Ukraine undergoes regularly dental inspection and treatment in district stomatological polyclinics. There are three main departments in such polyclinics: a department of therapy, oral surgery and orthodontics and prosthetic dentistry department. Some laboratories and X - ray rooms are also attached to every dental polyclinic. District polyclinics also have dental emergency rooms working at night for the patients with a severe toothache and dental traumas such as cuts of the oral cavity and knocked out teeth.

If you have some trouble with your tooth or a bad toothache you should consult a dentist. He will examine your oral cavity carefully and if the aching tooth is not far gone he will stop it. If the dentist reveals any cavity in the tooth he'll clean and drill it and then put in a filling or fill the cavity. In case the tooth is too bad to be treated or neglected, the dentist will have to extract it. Before extracting a tooth he will apply

some anesthetic or give an injection to deaden the pain. And after the extraction the dentist may administer you some anti-inflammatory drugs.

If you have some inflammation or an abscess in your mouth, if the teeth become loose and gums bleed, you should consult a subject matter specialist. He will diagnose your case and prescribe you a proper treatment. If an operation must be performed in the mouth cavity, a qualified oral surgeon will operate on you. If you need dentures, bridges, or crowns you must consult an orthodontist and he'll make a design of it. A dental mechanic will manufacture the necessary appliance according to the given design. Orthodontists can straighten teeth which are crooked. They put braces (wires) on the teeth to do this. Many children need to have this work done.

Most dentists work in an office environment. A workday can include removing decay, filling cavities, examining x-rays, straightening teeth, brightening teeth, realigning jaws, treating gum diseases, extracting teeth, fabricating substitutes for lost teeth and oral tissues, making models and measurements for dentures, performing surgery to correct facial and dental deformities caused by accidents or birth defects and simply educating patients on how to prevent oral health problems. Dentists also administer anesthetics and write prescriptions for antibiotics and other medications.

Dentists treat and interact with people of all ages, backgrounds and personalities on a daily basis. Every single patient has unique problems, so a dentist has to provide unique treatments for each individual. This makes workdays diverse and interesting though.

People should visit a dentist, no less than twice a year for early diagnoses and treatment of any disease. Finally, "prevention is better than cure". Proper oral hygiene and good eating habits (a limited consumption of sweets) will protect you from many dental diseases.

Exercise 5. Answer the following questions.

1. What departments are there in a stomatological polyclinic?
2. What must a person do if he has a bad toothache?
3. What does a dentist begin his examination with?

4. What does a dentist do if a tooth isn't far gone?
5. What should be performed when a tooth is far gone?
6. What conditions need surgical treatment?
7. In what cases do people have to consult an orthodontist?
8. In what cases do children need braces?
9. Where should a patient go in case of emergency?
10. How often should people visit a dentist?

Exercise 6. Agree or disagree with the following statements using the phrases:

1. There are very few clinics providing dental aid in Ukraine.
2. Before extracting a tooth a surgeon gives a patient some anesthetic.
3. If a tooth is not too bad it must be pulled out.
4. If you need artificial dentures or crowns you must consult a dental surgeon.
5. Too much sweets will do your teeth no harm.
6. Regular filling the teeth and extracting them are important for the development of dental diseases.
7. X-ray rooms are working at night for the patients with a severe toothache.
8. Oral surgeon straightens crooked teeth with the help of braces and wires.

Exercise 7. Match the terms with their definitions:

1. dental polyclinic	a) is a dentist who makes dental appliances and restorative devices, such as bridges or dentures, to the specifications of a dentist.
2. department of oral and maxillofacial surgery	b) a clinic that provides both general and specialist dental examinations and dental treatments
3. dental examination	c) room with x ray in dental polyclinic
4. dental emergency rooms	d) is a dentist trained to diagnose, prevent, and treat teeth and jaw irregularities. They correct existing conditions and are trained to identify problems that may develop in the future.
5. orthodontist	
6. dental mechanic	
7. X - ray rooms	

	<p>e) offers a comprehensive service relating to conditions of the face, mouth and jaws, including a routine assessment and treatment service for common oral surgical conditions.</p> <p>f) the dentist or hygienist will clean your teeth and check for cavities and gum disease.</p> <p>g) rooms working at night for the patients with a severe toothache and dental traumas such as cuts of the oral cavity and knocked out teeth.</p>
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Exercise 8. Put in the verbs given in brackets in the correct tense:

1. Last night I (can) not sleep because I (to have) a bad pain in the tooth.
2. The dental nurse (to make) you an injection.
3. Every doctor always (to deal) with his patients carefully and attentively.
4. I usually (to brush) my teeth twice a day.
5. He (to have) allergy to anesthetics.
6. There (to be) a computer in the reception room.
7. The dentist (to receive) his patients in Room № 13.
8. What (to reveal) the X-ray examination of the mouth?

Exercise 9. Rephrase the parts in bold type in the following sentences.

1. One must undergo dental **inspection** twice a year.
2. If a tooth is not **far gone** the doctor will treat it.
3. The dentist will not **put in a filling** today, he will do it in two days.
4. This tooth can't be stopped, it must be **pulled out**.
5. The dentist **makes a hole** in the tooth to remove the area destroyed by caries.
6. The nurse gave an injection **to relieve the pain**.
7. Teeth may become **not fixed in place** due to gum diseases.

8. Orthodontists **apply wires** to **irregular positioned teeth**.

Exercise 10. Give the synonyms for:

to stop a toothache, dental technician, to pull a tooth out, a tooth is far gone, a dental examination, to prescribe a treatment, to make (to produce), dental brackets.

Exercise 11. Open the brackets using correct forms of the verbs.

1. Surgeons extract teeth that cannot (treat).
2. The examination of the oral cavity (perform) by the prosthodontist when people want dentures.
3. Bridges, crowns and dentures (make) of different materials.
4. Medical science (to make) a lot of progress in recent years both in treatment and diagnosis.
5. Different measures (to take) to save the tooth but it doesn't help.
6. Preventive care (to deal) with the two major tooth troubles: caries and gum diseases.
7. The patient (to limit) already the consumption of sweets.
8. The doctor (to drill) the left lower molar now.

Exercise 12. Make questions to the underlined words.

1. Oral therapy includes such procedures as cleansing and drilling and filling teeth.
2. Before starting to work with patients in clinics, students are taught basic theoretical and practical sciences.
3. Before filling a tooth, the doctor must clean and drill it.
4. Doctors are looking for new ways to help patients.
5. People should undergo dental examination twice a year.
6. Many measures have been made up to prevent dental diseases recently.
7. If the tooth can't be saved it'll be extracted.
8. The doctor will have to extract the tooth to stop the infection.

Exercise 13. Read the dental jokes:

1. A woman and her husband interrupted their vacation to go to a dentist. "I want a tooth pulled, and I don't want any Novocaine because I am in a big hurry," the woman said. "Just extract the tooth as quickly as possible, and we will be on our way." The dentist was quite impressed. "You are certainly a courageous woman," he said. "Which tooth is it?" The woman turned to her husband and said, "Show him your tooth, dear."

2. "Open wider." requested the dentist, as he began his examination of the patient's teeth. "Good God!" he said startled. "You've got the biggest cavity I have ever seen - the biggest cavity I have ever seen." "OK, Doc!" replied the patient, "I'm scared enough without you saying something like that twice." "I didn't!" said the dentist. "That was the echo."

Exercise 14. Ask your dentist about: WHY your tooth hurts you so much

1. WHETHER (IF) your tooth can be treated or not
2. it can be filled or not
3. it must be extracted
4. WHERE you can find the laboratory
5. HOW LONG it will take you to have your teeth treated
6. WHEN you must come next time
7. WHAT you must do to protect yourself from tooth decay

Exercise 15. Read and translate the dialogue.

A DIALOGUE

Doctor (D): How do you do, Mr. N.? What can I do for you?

Patient (P): I've got a bad tooth that aches all day and night.

D: Let me have a look at it. Well, I'm afraid it's too late to have it filled, the only thing I can do now is to extract it.

P: (*pretending to be calm*): All right, Doctor, but not without an injection.

D: (*filling a syringe and getting his instruments ready*): Certainly, Mr. N., it won't hurt at all, just keep your mouth wide open.

D: (*gives Mr. N. an injection in the gum, waits a couple of minutes, gets hold of the tooth and extracts it*): It's all over. Was it so bad?

P: (*with a sigh of relief*): Not at all, thank you very much.

Exercise 16. Try to complete the dialogue below using the Active Vocabulary.

Patient: ...

Doctor: How do you do. What's the trouble?

Patient:

Doctor: Well...Take this chair...Open your mouth, please. Here is a cavity that needs filling. **Patient:**

(The doctor is treating a cavity.)

Doctor: Now it won't give you any more trouble.

Patient:

Doctor: Good-bye.

Exercise 17. Dwell upon “visiting a dentist” using the prompts.

1. A dental polyclinic includes.....
2. The dentist starts with
3. If the tooth isn't far gone, the dentist does the following:
4. If the tooth can't be saved, the dentist
5. Prevention is better than cure, that is why

Self-check

I. Answer the questions:

What departments are there in a stomatological polyclinic?

What does a dentist begin his examination with?

What does a dentist do if a tooth can't be saved?

In what cases do people have to consult an orthodontist?

In what cases do children need braces?

II. Describe the terms:

visiting a dentist