

МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВ'Я УКРАЇНИ
ОДЕСЬКИЙ НАЦІОНАЛЬНИЙ МЕДИЧНИЙ УНІВЕРСИТЕТ

Міжнародний факультет

Кафедра філософії, біоетики та іноземних мов

ЗАТВЕРДЖУЮ

Проректор з науково-педагогічної роботи


Едуард Бурячківський

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**МЕТОДИЧНІ РЕКОМЕНДАЦІЇ ДО САМОСТІЙНОЇ РОБОТИ ЗДОБУВАЧІВ ВИЩОЇ
ОСВІТИ З НАВЧАЛЬНОЇ ДИСЦИПЛІНИ**

Рівень вищої освіти: другий (магістерський)

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Спеціальність: 226 «Фармація, промислова фармація»

Освітньо-професійна програма: Фармація, промислова фармація

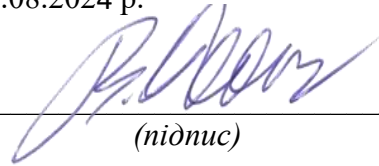
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Тема № 1: Вища медична освіта в Україні

Мета: ознайомити здобувачів вищої освіти з вищою медичною освітою в Україні. Поглибити нарративні навички на основі опису навчання у медичному вузі. Вивчити лексичний матеріал даної теми і вміти оперувати цією лексикою. Описувати види роботи вищого медичного навчального закладу.

Основні поняття: студент-медик; медичний університет; ОНМедУ; психіатрія; фармакологія; педіатрія; неврологія; акушерство; гінекологія; анестезія; хірургія

I. План

Знайомство із текстом за темою.

II. Практичні заняття, які виконуватимуться

Exercise 1. Answer the following questions:

1. What educational institutions train future doctors and pharmacists?
2. Who is a medical university headed by?
3. How long does the training course at the medical university last?
4. What does the training course include?
5. What languages is the training course provided in?
6. What do students take at the end of each term?
7. What kind of training do the students have during the first two years?
8. What subjects do they study during pre-clinical training?
9. What subjects do students of medical universities study during the senior years?
10. Where do young medical specialists work after graduation?
11. What specialists are engaged in the research work?
12. How many faculties are there at ONMedU now?
13. What modern facilities is ONMedU equipped with?

Exercise 2. Fill in the blanks with the appropriate words from the text:

1. The procedure of admission to medical universities in Ukraine has _____ greatly recently.
2. _____ training for doctors takes six years in Ukraine.
3. The curriculum and _____ for medical universities are approved by the Ministry of Public Health.
4. During pre-clinical training, students study subjects such as Physics, Chemistry, Anatomy, Biology, and _____.
5. Senior students acquire practical skills by working at hospitals, polyclinics, sanitary _____, and pharmacies.
6. All the medical universities in Ukraine teach their courses in English, Ukrainian, or _____.
7. Odesa National Medical University is considered to be one of the top medical universities _____ Ukraine.

Exercise 3. Match the words on the left with their definitions:

1. Internship
2. Syllabuses
3. Thesis
4. Pharmacists
5. Epidemiological
6. Simulation
7. Collaboration
8. Accreditation
9. Interdisciplinary
10. Diagnosis

- a. A detailed study or investigation on a particular topic.
- b. Training or work experience in a particular field.
- c. The process of determining a patient's illness or condition.
- d. The study and control of diseases in populations.
- e. A program of study approved by an educational institution.
- f. Working together with others toward a common goal.
- g. The process of officially recognizing someone or something.
- h. Individuals trained in the preparation and dispensing of drugs.
- i. Involving two or more academic disciplines.
- j. The imitation or emulation of a situation or process.

Exercise 4. Indicate whether the following statements are true or false based on the information from the text:

1. Medical universities in Ukraine require entrance exams for admission.
2. Dentists' training in Ukraine lasts for six years.
3. The curriculum for medical universities in Ukraine is approved by the Ministry of Education.
4. Senior students only study theoretical subjects during their training.
5. Interns in Ukraine start working immediately after passing state examinations.
6. Medical universities in Ukraine teach their courses only in Ukrainian.
7. Odesa National Medical University has collaborations with other medical simulation centers worldwide.

Exercise 5. Fill in the blanks with the correct verb tense:

1. Before the changes, Ukrainian school-leavers _____ (take) entrance exams for medical universities.
2. The curriculum and syllabuses for medical institutes _____ (approve) by the Ministry of Public Health.
3. During pre-clinical training, students _____ (study) general subjects such as Physics and Biology.
4. Senior students _____ (acquire) practical skills at hospitals and polyclinics.
5. After passing state examinations, young doctors _____ (begin) to work as interns.
6. Final tests _____ (take) by medical students at the end of each course of study.
7. Applicants _____ (assess) in Chemistry and Biology at secondary school for admission.

Список рекомендованої літератури

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Електронні інформаційні ресурси

1. Одеський національний медичний університет: <https://onmedu.edu.ua/>
2. Інформаційні матеріали: <http://www.info.odmu.edu.ua>

Тема № 2: Охорона здоров'я та медичні заклади в Україні

Мета: ознайомити здобувачів вищої освіти з охороною здоров'я та медичними закладами в Україні. Поглибити нарративні навички на основі опису системи охорони здоров'я в Україні. Вивчити лексичний матеріал даної теми і вміти оперувати цією лексикою. Описувати види медичних навчальних закладів.

Основні поняття: медична послуга, медична допомога, медичні установи, поліклініка, лікарня, швидка допомога

I. План

Знайомство із текстом за темою.

II. Практичні заняття, які виконуватимуться

Exercise 1. Answer the questions:

1. What is healthcare service?
2. What is medical care divided into?
3. What is primary medical care?
4. Whom is secondary care provided by?
5. What are the medical institutions?
6. What is a polyclinic?
7. What is a hospital?
8. What is an EMS?

Exercise 2. Match the following terms with their definitions:

1. Primary medical care
2. Secondary care
3. Tertiary care
4. Polyclinic
5. Hospital
6. Emergency medical service (EMS)
- 7 Pharmacy

- a. The central function and main link of the healthcare system, providing general medical aid.
- b. Provided by doctors with appropriate specialization, offering more specialized treatment and consultation.
- c. Highly specialized care for complex diseases, usually provided at regional medical institutions.
- d. Health care facility for outpatient examinations and treatment, independent of a hospital.
- e. Medical institution aimed at treatment of sick, injured, or dying people, with specialized staff and equipment.
- f. Out-of-hospital medical care and transportation of patients with diseases and injuries to hospitals.
- g. Institution where people can purchase drugs and medical supplies.

Exercise 3. Indicate whether the following statements are true or false:

1. Primary medical care is usually provided at regional medical institutions.
2. Secondary care includes more specialized treatment than primary care.
3. Tertiary care is focused on general health maintenance.
4. Polyclinics provide examinations and treatment for inpatients.
5. Hospitals typically have emergency departments for urgent health problems.
6. Emergency medical services are carried out only by hospitals.
7. Pharmacies are institutions where people can buy groceries.

Exercise 4. Fill in the blanks with the appropriate word from the text:

1. _____ is an independent dynamic system consisting of structural and functional elements.
2. Primary medical care is built on the principle "from the _____ to the center".
3. The government of Ukraine announced the start of medical reform in _____.
4. Secondary care is provided by doctors with appropriate _____.
5. Highly specialized care is mainly provided at regional medical _____ and centers.
6. Polyclinics provide examinations and treatment for _____.
7. A pharmacy is an institution where people can buy different _____ and things for medical care.

Exercise 5. Choose the correct answer for each question:

1. What is the central function of the healthcare system?
 - a) Secondary care
 - b) Tertiary care
 - c) Primary medical care
 - d) Pharmacy

2. What type of care is mainly provided at regional medical institutions and centers?
 - a) Primary care
 - b) Secondary care
 - c) Tertiary care
 - d) Emergency medical service

3. Where can people buy drugs and medical supplies?
 - a) Hospital
 - b) Pharmacy
 - c) Polyclinic
 - d) Emergency medical service

4. What is the main link of the healthcare system?
 - a) Tertiary care
 - b) Pharmacy
 - c) Primary medical care
 - d) Emergency medical service

5. Which type of care is provided by doctors with appropriate specialization?
 - a) Primary care
 - b) Secondary care
 - c) Tertiary care

d) Pharmacy

6. What is the aim of hospitals?

- a) To provide outpatient care
- b) To treat sick, injured, or dying people
- c) To provide emergency medical services
- d) To sell medical supplies

7. What provides out-of-hospital medical care and transportation of patients?

- a) Pharmacy
- b) Emergency medical service
- c) Hospital
- d) Polyclinic

Список рекомендованої літератури

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Тема № 3: **Фармація**

Мета: Засвоїти лексичний матеріал пов'язаний з даною темою. Перечислити, що можна придбати в аптеці. Вивчити складову рецепта.

Основні поняття: аптека, фармацевт, ліки, рецепт, передозування, етикетка, аптечна шафа, термін придатності

I. План

Знайомство із текстом за темою.

II. Практичні заняття, які виконуватимуться

Exercise 1. Answer the questions.

1. What is a chemist's shop?
2. What departments are there at every chemist's?
3. What can a person buy at the chemist's department?
4. What can a person buy at the prescription department?
5. Where are all the drugs kept at the chemist's?
6. Why are some drugs sold by prescription only?
7. What are the necessary particulars on the label?
8. What does the complete prescription consist of?

Exercise 2. Match the following terms with their definitions:

- 1. Chemist's shop**
- 2. Drug store**
- 3. Prescription department**
- 4. Drug cabinets**
- 5. Poisonous drugs**
- 6. Prescription**
- 7. Inscription**

- a. Institution of health service supplying medicines and medical items.
- b. Section where potent drugs are sold under the supervision of a pharmacist.
- c. Storage units for medicines in a pharmacy.
- d. Medications requiring a doctor's written authorization for purchase.
- e. Area of a pharmacy where prescriptions are filled.
- f. Written order by a doctor for a specific medication.
- g. Label containing the ingredients and quantities of a medication.

Exercise 3. Indicate whether the following statements are true or false:

1. A chemist's shop is an institution of health service that provides only medical care.
2. Prescription drugs can be sold without a doctor's authorization.
3. Yellow labels on medicine containers indicate drugs for internal use.
4. The prescription includes the patient's name and the pharmacist's signature.
5. In continental Europe, prescriptions are typically written in English.

6. Drug cabinets are used to store only non-prescription medications.
7. Narcotic drugs can be sold over the counter without any restrictions.

Exercise 4. Fill in the blanks with the appropriate word from the text:

1. The chemist's shop supplies the population with _____ and medical items.
2. _____ drugs are sold by prescription only at the prescription department.
3. All medicines are kept in drug cabinets, open shelves, and refrigerators at a _____.
4. Every container of dispensed medicines has a label indicating the _____, correct dosage instructions, and expiry date.
5. The structure of a complete prescription includes the patient's name, the superscription, the _____, and the subscription.
6. In continental Europe, prescriptions are written out in _____ abbreviations.
7. The chemist's department sells drugs ready to use and different things for _____ care.

Exercise 5. Choose the correct answer for each question:

1. What is another term for a chemist's shop?
 - a) Clinic
 - b) Drug store
 - c) Hospital
 - d) Laboratory
2. Where are poisonous drugs sold?
 - a) Chemist's department
 - b) Prescription department
 - c) Drug cabinets
 - d) Open shelves
3. What do white labels on medicine containers indicate?
 - a) Drugs for external use
 - b) Drugs for internal use
 - c) Injectable drugs
 - d) Expired drugs
4. What is included in the prescription?
 - a) Patient's name and pharmacist's signature
 - b) Superscription, inscription, and subscription
 - c) Doctor's name and patient's address
 - d) Drug name and expiration date
5. How are prescriptions typically written in continental Europe?
 - a) In English
 - b) In Latin abbreviations
 - c) In Cyrillic script
 - d) In Chinese characters

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Тема № 4: Організм людини

Мета: Засвоїти терміни, які стосуються систем організму. Вміти описувати функції кожної системи. Вміти диференціювати органи, що відносяться до кожної системи.

Основні поняття: основні частини людського тіла, життєво важливі органи людського тіла, органи чуття

I. План

Знайомство із текстом за темою.

II. Практичні заняття, які виконуватимуться

Exercise 1. Answer the questions:

1. What are the principal parts of the human body?
2. What does the face include?
3. What is the organ of taste?
4. Where do eyelashes grow?
5. What does the eye consist of?
6. What do we breathe through?
7. What organ is responsible for hearing and balance?
8. What are the principal organs in the chest?
9. What organs does the abdomen consist of?
10. What does the upper/lower extremity consist of?
11. Why are fingers important?
12. What part of the body is responsible for sense of touch?
13. What supports the soft parts and protects the organs from injury?

Exercise 2. Match the following terms with their definitions:

1. Head
2. Trunk
3. Limbs
4. Skull
5. Face
6. Neck
7. Chest

- a. Contains the brain
- b. Principal parts of the human body
- c. Connected with the trunk
- d. Organ of sight
- e. External part of the ear
- f. Upper part of the trunk
- g. Structure above the shoulders

Exercise 3. Indicate whether the following statements are true or false:

1. The human body consists of three main parts: the head, the trunk, and the limbs.
2. The skull contains the heart.

3. The nose is the organ of sight.
4. The mouth includes the lips, tongue, teeth, and palate.
5. The waist is the narrow middle part of the body below the hips.
6. The upper extremity refers to the arm.
7. The foot is composed of the fingers, heel, and sole.

Exercise 4. Fill in the blanks with the appropriate words from the text:

1. Each eye has the eyelids and the _____ that grow along the edge of the eyelids.
2. The nose is the organ of _____ through which we breathe.
3. The upper part of the trunk is the _____.
4. The lower part of the trunk called abdomen consists of the stomach, the liver, the _____, and the bladder.
5. The surface of the body from the neck to the buttocks is called the _____.
6. When we speak of the upper extremity, we mean the _____.
7. The lower extremity called the leg consists of the thigh, the knee, the calf, the ankle, and the _____.

Exercise 5. Choose the correct answer for each question:

1. What are the principal parts of the human body?
 - a) Arms, legs, and head
 - b) Head, trunk, and limbs
 - c) Chest, abdomen, and waist
 - d) Skull, face, and neck

2. Which part of the body is responsible for hearing and balance?
 - a) Nose
 - b) Ear
 - c) Mouth
 - d) Eye

3. Where is the upper extremity connected with the chest?
 - a) Wrist
 - b) Elbow
 - c) Shoulder
 - d) Hand

4. What is the lower extremity called?
 - a) Arm
 - b) Leg
 - c) Finger
 - d) Toe

5. What covers the surface of the body?
 - a) Muscles
 - b) Skin
 - c) Bones
 - d) Blood

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Тема № 5: Мікроорганізми частина 1

Мета: Визначити терміни, що стосуються цієї теми. Вміти описувати функції різних видів мікроорганізмів. Вміти відповідати на запитання до тексту.

Основні поняття: водорості, археї, бактерії, гриби, віруси, дріжджі

I. План

Знайомство із текстом за темою.

II. Практичні заняття, які виконуватимуться

Exercise 1. 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 are the three domains of life of microbes?
7. What domains do prokaryotes and eukaryotes belong to?
8. What microorganisms do not fall within any of the three domains of life?
9. What unicellular organism do we call a prokaryote?
10. How can eukaryotes reproduce?
11. What shapes may all bacteria have?

Exercise 2. Match the following terms with their definitions:

1. Microorganism
2. Prokaryote
3. Eukaryote
4. Bacilli
5. Cocci
6. Archaea
7. Extremophiles

- a. Unicellular organism without a nucleus
- b. Organisms with cells containing a nucleus
- c. Small, rod-shaped bacteria
- d. Spherical bacteria
- e. Microscopic organism
- f. Organisms living in extreme environments
- g. Evolutionarily distinct group of microorganisms

Exercise 3. Indicate whether the following statements are true or false:

1. Microorganisms are visible to the naked eye.
2. Eukaryotes lack a membrane-bound nucleus.
3. Bacteria are prokaryotes.
4. Bacteria come in four varieties: bacilli, cocci, spirilla, and vibrio.
5. Archaea are similar to bacteria but are part of the same domain of life.
6. Prokaryotes reproduce through fusion of gametes.

7. Eukaryotes can only reproduce asexually.

Exercise 4. Fill in the blanks with the appropriate words from the text:

1. Bacteria _____ in all environments.
2. Eukaryotic cells typically contain membrane-bound organelles such as mitochondria and the _____.
3. Bacteria are responsible for the breakdown of dead organic matter into its constituent _____.
4. _____ are similar to, but evolutionarily distinct from bacteria.
5. Many archaea have been found living in extreme _____.
6. Prokaryotes are unicellular organisms that lack a membrane-bound _____.
7. Eukaryotes can reproduce both asexually through _____ and sexually through meiosis.

Exercise 5. Choose the correct answer for each question:

1. Which domain of life do archaea belong to?
 - a) Archaea
 - b) Bacteria
 - c) Eukarya
 - d) None of the above
2. What are extremophiles?
 - a) Microorganisms found in extreme environments
 - b) Bacteria with extremities
 - c) Eukaryotes with extreme metabolism
 - d) None of the above
3. What is the main difference between prokaryotes and eukaryotes?
 - a) Prokaryotes have a membrane-bound nucleus; eukaryotes do not.
 - b) Eukaryotes have a membrane-bound nucleus; prokaryotes do not.
 - c) Both have a membrane-bound nucleus.
 - d) Neither has a membrane-bound nucleus.
4. What is the function of chlorophyll in archaea?
 - a) To carry out photosynthesis
 - b) To break down organic matter
 - c) To reproduce
 - d) None of the above
5. What shapes can archaea have?
 - a) Spherical, rod, and spiral
 - b) Spherical, oval, and rectangular
 - c) Round, long, and flat
 - d) Circular, elongated, and hexagonal

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2. Інформаційні матеріали: <http://www.info.odmu.edu.ua>

Тема № 6: Мікроорганізми частина 2

Мета: Визначити терміни, що стосуються цієї теми. Вміти описувати функції різних видів мікроорганізмів. Вміти відповідати на запитання до тексту.

Основні поняття: Водорості, грибки, віруси, гельмінти

I. План

Знайомство із текстом за темою.

II. Практичні заняття, які виконуватимуться

Exercise 1. Answer the questions:

1. What microorganism contain chlorophyll and thus can carry out photosynthesis?
2. Where may algae normally occur?
3. What is the difference between algae and fungi?
4. What are fungi?
5. What environments are yeasts usually found in?
6. What beneficial uses do some yeasts have?
7. What eukaryotes have been used to make pharmaceuticals?
8. What eukaryotic microorganisms move with help from hair-like structures called cilia or whip-like structures called flagella?
9. How do some phytoflagellate protozoa obtain their energy?
10. What does a virus consist of?
11. What are the multicellular parasitic worms called?
12. What groups may helminthes be subdivided into?

Exercise 2. Match the following terms with their definitions:

1. Algae
2. Fungi
3. Yeasts
4. Molds
5. Protozoa
6. Viruses
7. Helminthes

- a. Eukaryotic organisms that carry out photosynthesis
- b. Single-celled microorganisms with rigid cell walls
- c. Unicellular fungi
- d. Multicellular fungi
- e. Single-celled eukaryotic microorganisms
- f. Acellular infectious agents
- g. Multicellular parasitic worms

Exercise 3. Fill in the blanks with the appropriate words from the text:

1. _____ are single-celled eukaryotic microorganisms.
2. Some _____ are oval or spherical, others are elongated.
3. Yeasts are included within the study of _____.
4. Protozoa can move with the help of hair-like structures called _____.
5. A virus consists of proteins and genetic material, either DNA or _____.
6. Multicellular parasitic worms are called _____.
7. Molds consist of filamentous structures called _____.

Exercise 4. Choose the correct answer for each question:

1. What is a characteristic feature of algae?
 - a) Lack of chlorophyll
 - b) Unicellularity
 - c) Presence of roots, stems, and leaves
 - d) Ability to carry out photosynthesis
2. What is the main difference between yeasts and molds?
 - a) Yeasts are unicellular; molds are multicellular.
 - b) Yeasts contain chlorophyll; molds do not.
 - c) Yeasts have rigid cell walls; molds do not.
 - d) Yeasts are photosynthetic; molds are not.
3. How do protozoa move?
 - a) By flying
 - b) With the help of flagella or cilia
 - c) By crawling
 - d) By swimming
4. What are viruses composed of?
 - a) Cells
 - b) Proteins and genetic material
 - c) Lipids and carbohydrates
 - d) Nuclei and organelles
5. What characterizes helminthes?
 - a) Unicellularity
 - b) Acellular structure
 - c) Parasitism
 - d) Ability to photosynthesize

Exercise 5. Fill in the blanks with the correct prepositions:

1. Algae can be found _____ water, especially _____ plankton.
2. Yeasts are included _____ the study _____ microbiology.
3. Some protozoa move _____ help _____ hair-like structures called cilia.
4. Cells are cylindrical _____ shape and are attached end _____ end _____ form threadlike filaments _____ molds.
5. Multicellular parasitic worms called helminthes are not technically microorganisms, but they fall _____ the field _____ microbiology.

6. Protozoa can be as small _____ 1 μm _____ diameter _____ as large _____ 2 mm.
7. A virus replicates only inside the living cells _____ an organism.
8. Most protozoa are harmless, but some can cause disease _____ animals _____ humans.
9. Fungi do not contain chlorophyll and thus cannot carry _____ photosynthesis.
10. Some yeasts have beneficial uses, such _____ their ability to ferment carbohydrates.

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Тема № 7: Тканини

Мета: Засвоїти терміни, що відносяться до цієї теми. Знати основні тканини органи людського організму. Вивчити класифікацію епітелію.

Основні поняття: порожнина, епітелій, волокно, глія, тканина

I. План

Знайомство із текстом за темою.

II. Практичні заняття, які виконуватимуться

Exercise 1. Answer the questions:

1. What is a tissue?
2. What are the main tissues in the human body?
3. What kind of tissues protects our body from moisture loss, bacteria, and internal injury?
4. What are the main functions of covering and lining epithelium?
5. Where can a loose connective tissue be found in our body?
6. What differs a muscle tissue from other tissue types?
7. What are the main three kinds of muscle tissues?
8. What is a tissue membrane?
9. What does connective tissue membrane encapsulate?
10. What does mucous membrane line?
11. What is a serous membrane?
12. How is cutaneous membrane also called?
13. What is the function of the hyaluronan?
14. What is histology?

Exercise 2. Match the terms with their definitions:

1. Histology

2. Endoderm

3. Synovial membrane

4. Mucous membrane

5. Skeletal muscle tissue

- a. The field of study involving microscopic examination of tissue appearance, organization, and function.
- b. The innermost of the three germ layers of an embryo, giving rise to the lining of the digestive and respiratory tracts.
- c. A thin layer of connective tissue that lines the joint cavities and produces synovial fluid.
- d. A composite of connective and epithelial tissues, lining body cavities and hollow passageways opening to the external environment.

e. Muscle tissue attached to bones, responsible for voluntary movement.

Exercise 3. Fill in the blanks with the correct words:

1. The term tissue refers to an aggregation of cells that are similar in structure and perform a specific _____.
2. Nervous tissue forms the _____ system, responsible for coordinating activities and movements.
3. Fibrous connective tissue holds body parts together and is found in _____, tendons, cartilages, and bones.
4. The skin is an example of an _____ membrane composed of epithelium and connective tissue.
5. Synovial membranes line the cavity of freely movable _____.

Exercise 4. Fill in the blanks with the correct prepositions:

1. Tissues are organized into four broad categories based _____ structural and functional similarities.
2. Epithelial tissue provides a covering _____ deeper body layers.
3. Fibrous connective tissue holds the outer layer of skin _____ the underlying muscle tissue.
4. The mucous membrane lines the body cavities and hollow passageways _____ open to the external environment.
5. The skin is an epithelial membrane resting _____ top of connective tissue.

Exercise 5. Complete the sentences with the correct forms of the verbs:

1. The skin (protect) the body from desiccation and pathogens.
2. Synovial membranes (release) hyaluronan into the joint cavity.
3. The epithelial exocrine glands (produce) mucous that covers the epithelial layer.
4. Fibroblasts in the synovial membrane (help) support the fragile epithelial layer.
5. Tissues of the body (develop) from the three primary germ cell layers.

Exercise 6. Choose the correct option to complete the sentences:

1. Histology is the field of study that involves the microscopic examination of:
 - a) Cells
 - b) Tissues
 - c) Organs
 - d) All of the above
2. Loose connective tissue holds the outer layer of skin to the underlying:
 - a) Nerves
 - b) Muscles
 - c) Tissues
 - d) Bones
3. The skin is an epithelial membrane resting on top of:
 - a) Epithelium
 - b) Connective tissue
 - c) Muscle tissue

d) Nervous tissue

4. Nervous tissue forms the:

- a) Endocrine system
- b) Nervous system
- c) Muscular system
- d) Skeletal system

5. Synovial membranes produce synovial fluid, which acts as a natural lubricant for:

- a) Bones
- b) Joints
- c) Muscles
- d) Ligaments

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Тема № 8: **Метаболізм**

Мета: Вивчити терміни, які стосуються метаболізму. Ознайомитися з двома типами метаболізму. Вміти розповідати про основні типи поживних речовин.

Основні поняття: вуглевод, з'єднання, жир, білок, джерело

I. План

Знайомство із текстом за темою.

II. Практичні заняття, які виконуватимуться

Exercise 1. Answer the questions:

1. What is metabolism?
2. Why are enzymes necessary for the digestive system?
3. What are the body's energy sources?
4. How does metabolism act?
5. What is anabolism?
6. What is catabolism?
7. What does catabolism provide?
8. What controls metabolism?
9. What is a calorie?
10. What is BMR?

Exercise 2. Match the terms with their definitions:

- 1. Metabolism**
- 2. Anabolism**
- 3. Catabolism**
- 4. Thyroxine**
- 5. Basal Metabolic Rate (BMR)**

- a. The hormone made and released by the thyroid gland, controlling the rate of metabolism.
- b. The process of breaking down substances to release energy for cell activity.
- c. The chemical reactions in the body's cells that change food into energy.
- d. The process of building and storing substances for growth and energy storage.
- e. A measure of the rate at which the body burns energy while at rest.

Exercise 3. Indicate whether the following statements are true or false:

1. Metabolism involves chemical reactions that change food into energy.
2. Anabolism is the process of breaking down substances for energy.
3. Thyroxine is a hormone that regulates the body's metabolic rate.
4. Basal Metabolic Rate (BMR) measures the body's energy expenditure during physical activity.
5. Catabolism releases energy for cell activity.

Exercise 4. Fill in the blanks with the correct words:

1. _____ is the process of breaking down substances to release energy for cell activity.
2. Thyroxine is a hormone produced by the _____ gland.
3. _____ is the process of building and storing substances for growth and energy storage.
4. The _____ is a measure of the rate at which the body burns energy while at rest.
5. Metabolism involves the chemical reactions that change food into _____.

Exercise 5. Fill in the blanks with the correct prepositions:

1. After we eat food, the digestive system uses enzymes to break proteins down _____ amino acids.
2. The pancreas secretes hormones that help determine whether the body's main metabolic activity at any one time are _____ anabolic or catabolic.
3. Metabolism involves chemical reactions that change food into energy, providing fuel for _____ activity in the cells.
4. BMR is a measure of the rate _____ which a person's body burns energy while at rest.
5. Calories are units that measure how much energy a particular food provides _____ the body.

Exercise 6. Complete the sentences with the correct forms of the verbs:

1. Thousands of metabolic reactions happen at the same time — all (regulate) by the body.
2. The body (absorb) sugar, amino acids, and fatty acids as energy sources when needed.
3. After they (enter) the cells, other enzymes act to speed up or regulate the chemical reactions involved with "metabolizing" these compounds.
4. BMR (affect) by how much a person exercises and the amount of fat and muscle in his or her body.
5. Someone with a low BMR (tend) to gain more pounds of body fat over time than a similar-sized person with an average BMR.

Exercise 7. Choose the correct option to complete the sentences:

1. Thyroxine is a hormone made and released by the:
 - a) Pancreas
 - b) Thyroid gland
 - c) Liver
 - d) Pituitary gland
2. Metabolism involves chemical reactions that change food into:
 - a) Vitamins
 - b) Minerals
 - c) Energy
 - d) Water
3. Basal Metabolic Rate (BMR) measures the rate at which the body burns energy while:
 - a) Exercising
 - b) Resting
 - c) Sleeping
 - d) Eating

4. Catabolism is the process that produces the energy needed for all activity in the:

- a) Cells
- b) Muscles
- c) Liver
- d) Bones

5. Anabolism is the process that supports the growth of:

- a) Fat cells
- b) New cells
- c) Old cells
- d) Dead cells

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Тема № 9: Вітаміни та мінерали

Мета: Визначити терміни, що стосуються цієї теми. Вивчити функції вітамінів та мінералів у життєдіяльності організму. Визначити взаємодію вітамінів та мінералів.

Основні поняття: мідь, йод, залізо, поживна речовина, калій, натрій, сірка, олово

I. План

Знайомство із текстом за темою.

II. Практичні заняття, які виконуватимуться

Exercise 1. Answer the questions:

1. What vitamins can be synthesized in the body?
2. How are vitamins classified?
3. How many vitamins are universally recognized?
4. Why is it unnecessary to ingest fat-soluble vitamins daily?
5. How are water-soluble vitamins excreted out of the body?
6. What minerals are there?
7. What does iron do in the body?
8. How do vitamins and minerals strengthen and help each other?

Exercise 2. Match the terms with their definitions:

1. **Vitamin**
2. **Water-soluble**
3. **Fat-soluble**
4. **Minerals**
5. **Niacin**

- a. Organic compound required in tiny amounts by an organism, obtained from the diet.
- b. Vitamins that cannot be stored and must be ingested frequently for optimal health.
- c. Minerals needed by the body to perform various functions, from building bones to transmitting nerve impulses.
- d. Vitamins stored in the body's fatty tissue, do not need to be ingested every day.
- e. Also known as Vitamin B3, it can be synthesized in the liver in small amounts.

Exercise 3. Indicate whether the following statements are true or false:

1. Vitamin D is the only exception to the rule that vitamins cannot be synthesized in the body.
2. Fat-soluble vitamins are easily excreted through the urine.
3. Water-soluble vitamins must be ingested frequently for optimal health.
4. Vitamins and minerals do not work together to strengthen each other.
5. Calcium and phosphorus build strong muscles and improve immune system performance.

Exercise 4. Fill in the Blanks Fill in the blanks with the correct words:

1. Vitamins are classified as either _____ or _____.
2. Vitamin C helps form tissues, cells, bones, and teeth and improves the immune system's _____.
3. There are 20 _____ including copper, iodine, chromium, and iron.

4. The body absorbs iron through the help of _____.
5. A diet naturally high in vitamins and minerals can be the best defense against many _____.

Exercise 5. Fill in the blanks with the correct prepositions:

1. Fat-soluble vitamins should be taken _____ meals.
2. Water-soluble vitamins should be taken _____ meals.
3. The body absorbs iron _____ the help of vitamin C.
4. A diet naturally high _____ vitamins and minerals can be the best defense against many diseases.
5. Minerals are used _____ many different functions, from building strong bones to transmitting nerve impulses.

Exercise 6. Complete the sentences with the correct forms of the verbs:

1. Vitamin D (synthesize) in the skin when exposed to sunlight.
2. Fat-soluble vitamins (store) in the body's fatty tissue.
3. The body (absorb) iron through the help of vitamin C.
4. Water-soluble vitamins (need) to be ingested frequently for optimal health.
5. Vitamin C (help) form tissues, cells, bones, and teeth.

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Тема № 10: Рослини. Їх будова та функції

Мета: Засвоїти лексичний матеріал за темою. Знати будову рослини. Вміти відповідати на запитання до тексту.

Основні поняття: хлорофіл, гамета, водорості, мохоподібні, покритонасінні

I. План

Знайомство із текстом за темою.

II. Практичні заняття, які виконуватимуться

Exercise 1. Answer the questions:

1. What does plant kingdom include?
2. What is the classification of algae based on?
3. How do Algae usually reproduce?
4. What are Bryophytes?
5. What is the main plant body of a bryophyte?
6. What is a sporophyte in pteridophytes differentiated into?
7. What are the plants in which ovules are not enclosed by any ovary wall?
8. What are the male and female sex organs in angiosperms?
9. What does a stamen consist of in angiosperms?
10. What does an anther produce after meiosis?
11. What does a pistil consist of?
12. Which plants provide a substantial proportion of the world's molecular oxygen?
13. What organization is the naming of plants governed by?

Exercise 2. Match the terms with their definitions:

1. Algae

2. Bryophytes

3. Pteridophytes

4. Gymnosperms

5. Angiosperms

- a. Plants with ovules not enclosed by an ovary wall, producing naked seeds.
- b. Simple, thalloid, largely aquatic organisms, classified into Chlorophyceae, Phaeophyceae, and Rhodophyceae.
- c. Plants dependent on water for sexual reproduction, divided into liverworts and mosses.
- d. Plants with a sporophyte as the main body, differentiated into true roots, stems, and leaves.
- e. Plants with male and female sex organs borne in flowers, undergo double fertilization.

Exercise 3. Indicate whether the following statements are true or false:

1. Algae reproduce only sexually.
2. Bryophytes have a more differentiated plant body compared to algae.
3. Pteridophytes require dry places to grow their gametophytes.
4. Gymnosperms produce seeds enclosed within an ovary wall.
5. Angiosperms are divided into monocotyledons and dicotyledons based on the number of cotyledons.

Exercise 4. Fill in the blanks with the correct words:

1. Algae are classified into three classes: Chlorophyceae, Phaeophyceae, and _____.
2. Bryophytes are dependent on water for _____ reproduction.
3. Pteridophytes possess well-differentiated _____ tissues in their organs.
4. Gymnosperms produce microspores and megaspores in microsporangia and _____.
5. Angiosperms undergo double _____ during fertilization.

Exercise 5. Fill in the blanks with the correct prepositions:

1. Algae are largely aquatic organisms, dependent _____ water for survival.
2. Pteridophytes require cool, damp places _____ the growth of their gametophytes.
3. Gymnosperms produce seeds exposed _____ fertilization.
4. Angiosperms are divided _____ monocotyledons and dicotyledons based _____ the number of cotyledons.
5. The naming of plants is governed _____ the International Code of Nomenclature _____ algae, fungi, and plants.

Exercise 6. Complete the sentences with the correct forms of the verbs:

1. Algae usually (reproduce) vegetatively by fragmentation.
2. Bryophytes (live) in soil but are dependent on water for sexual reproduction.
3. Gymnosperms (produce) naked seeds because their ovules are not enclosed by an ovary wall.
4. Angiosperms (be) divided into two classes based on the number of cotyledons.
5. The naming of plants (govern) by international codes of nomenclature.

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Тема № 11: Лікарські рослини

Мета: Засвоїти терміни, що відносяться до цієї теми. Ознайомитися з різними видами рослин. Вивчити терміни, які стосуються теми

Основні поняття: кора, ботанік, чистота, вологість, порошок, синтез, настойка

I. План

Знайомство із текстом за темою.

II. Практичні заняття, які виконуватимуться

Exercise 1. Answer the following questions:

1. What plants are considered to be medicinal?
2. What ingredient does willow bark contain?
3. What parts of a plant are drugs made from ?
4. When are leaves collected for producing drugs?
5. When are flowers collected for producing drugs?
6. When are fruits collected for producing drugs?
7. Which parts of plants are most preferred for producing drugs?
8. Why should effective measures be taken to protect a medicinal plants storage area?
9. What are the special conditions for the storage of plants?

Exercise 2. Match the terms with their definitions:

1. Medicinal plant
2. Salicylic acid
3. Botanist
4. Tincture
5. Cross-contamination

- a. A plant containing substances used for therapeutic purposes.
- b. The active ingredient in aspirin, found in willow bark.
- c. A scientist specializing in the study of plants.
- d. A solution of a medicinal substance in alcohol.
- e. Contamination caused by the transfer of bacteria or other microorganisms from one substance to another.

Exercise 3. Indicate whether the following statements are true or false:

1. Medicinal plants have historically played a minor role in medicine.
2. Over 50% of medicines prescribed in the U.S. are derived from plants.
3. Herbal medicine has become less complex over time.
4. Salicylic acid is not found in willow bark.
5. Flowers are collected after pollination for medicinal use.

Exercise 4. Fill in the blanks with the correct words:

1. Over 40% of medicines prescribed in the U.S. contain chemicals derived from _____.
2. Leaves should be collected when they are _____ developed.
3. Flowers are collected before the time of _____.
4. Medicinal plant materials should be stored in separate areas to prevent _____.
5. Containers should be located to allow free _____ circulation.

Exercise 5. Fill in the blanks with the correct prepositions:

1. Drugs are made from fruits, leaves, flowers, roots, seeds _____ the plants.
2. Leaves are collected _____ they are fully developed.
3. Flowers are collected _____ the time of pollination.
4. Special attention should be paid _____ the cleanliness of storage areas.
5. Containers should be located _____ allow free air circulation.

Exercise 6. Complete the sentences with the correct forms of the verbs:

1. Our ancestors noticed that aches and pains went away when they drank tea made from willow bark containing salicylic acid, which later (find) by scientists.
2. Today, many drug plants (cultivate) and collected from fields and woods.
3. Leaves should be collected when they (fully develop).
4. Special attention should be paid to the cleanliness of storage areas, particularly when dust (generate).
5. Medicinal plant materials (store) in separate areas to prevent cross-contamination.

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Тема № 12: Хімія та її галузі

Мета: Ознайомитися з галузями хімії. Вміти відповідати на запитання до тексту. Розвинути діалогічне мовлення.

Основні поняття: ланцюжок, склад, дисоціація, речовина, вимірювання, спостереження, походження, властивість, якість

I. План

Знайомство із текстом за темою.

II. Практичні заняття, які виконуватимуться

Exercise 1. Answer the following questions:

1. What is a major part of pharmacy education?
2. What is pharmacy?
3. What does chemistry study?
4. Why is chemistry sometimes called "the central science"?
5. What is alchemy?
6. What does analytical chemistry study?
7. What does biochemistry study?
8. What does inorganic chemistry study?
9. What does organic chemistry study?
10. What does nuclear chemistry study?

Exercise 2. Choose the correct answer for each question:

1. Which profession links health sciences with chemical sciences?
 - a) Medicine
 - b) Chemistry
 - c) Pharmacy
 - d) Biology
2. Chemistry is concerned with the composition, properties, and behavior of:
 - a) Matter
 - b) Energy
 - c) Light
 - d) Sound
3. Why is chemistry sometimes called "the central science"?
 - a) It is the oldest science.
 - b) It bridges other natural sciences together.
 - c) It is the most complex science.
 - d) It only focuses on chemical reactions.
4. What is the origin of the word "chemistry"?
 - a) Biology
 - b) Alchemy
 - c) Physics

d) Geology

5. Which sub-discipline of chemistry studies the properties and reactions of inorganic compounds?

- a) Analytical chemistry
- b) Biochemistry
- c) Inorganic chemistry
- d) Organic chemistry

6. What does pharmaceutical chemistry primarily focus on?

- a) Biological interactions
- b) Material analysis
- c) Drug quality testing
- d) Organic compounds

7. How does chemistry impact everyday life?

- a) It has no impact on everyday life.
- b) It provides a better standard of living.
- c) It only affects scientific careers.
- d) It influences only certain industries.

Exercise 3. Fill in the blanks with the correct words:

1. _____ is the branch of physical science that bridges health sciences and chemical sciences.
2. Chemistry is concerned with the composition, properties, and behavior of _____.
3. Chemistry is sometimes referred to as "the central science" because it bridges other natural sciences like _____ with each other.
4. The word "chemistry" originates from the earlier set of practices known as _____.
5. Pharmaceutical chemistry plays a leading role in the _____ of drug quality.
6. Chemistry impacts everyday life by providing a better _____ of living.
7. Nuclear chemistry studies how subatomic particles come together to form _____.

Exercise 4. Define the following terms in your own words:

- 1. Chemistry**
- 2. Analytical chemistry**
- 3. Biochemistry**
- 4. Inorganic chemistry**
- 5. Nuclear chemistry**
- 6. Organic chemistry**
- 7. Pharmaceutical chemistry**

Exercise 5. Consider the following scenarios and discuss their implications:

1. A new pharmaceutical company claims to have developed a revolutionary drug using principles of organic chemistry. How might this impact the medical field?
2. Analytical chemists discover a contaminant in a popular food product. What steps should be taken to address this issue?
3. A breakthrough in biochemistry leads to the development of a new treatment for a previously incurable disease. How might this change healthcare practices?

4. Inorganic chemists develop a more efficient method for synthesizing solar panels. How could this contribute to renewable energy initiatives?
5. Nuclear chemists propose a new method for safely disposing of radioactive waste. What are the potential environmental implications?
6. Organic chemists discover a novel way to produce biodegradable plastics. How might this impact efforts to reduce plastic pollution?
7. Pharmaceutical chemists identify a compound with potential anti-cancer properties. What further research is needed before it can be used as a treatment?

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Тема № 13: Органічна та неорганічна хімія

Мета: Освоїти основні положення органічної та неорганічної хімії. Вміти відповідати на запитання до тексту. Вивчити терміни, які стосуються теми

Основні поняття: кислота, альбумін, вуглець, вуглевод, з'єднання, гідроліз, ліпід, осад, білок

I. План

Знайомство із текстом за темою.

II. Практичні заняття, які виконуватимуться

Exercise 1. Answer the questions:

1. What does organic chemistry study?
2. What is the simplest organic compound?
3. What classes are organic compounds divided into?
4. What part of human body consists mostly of proteins?
5. What are proteins classified according to?
6. What are the examples of carbohydrates?
7. What is the advantage of lipids in comparison with proteins and carbohydrates?
8. What is the difference between organic and inorganic chemistry?
9. What is inorganic chemistry?
10. What is inorganic chemistry used for?

Exercise 2. Indicate whether the following statements are true or false:

1. Organic compounds always contain carbon.
2. Inorganic compounds are primarily composed of carbon.
3. Proteins are made of amino acids.
4. Lipids are soluble in water.
5. Carbohydrates are classified based on the number of oxygen atoms.
6. Inorganic chemistry deals with the transformation of matter without changes in composition.
7. Lipids contain more energy per unit of weight compared to proteins and carbohydrates.

Exercise 3. Fill in the blanks with the correct words:

1. Organic compounds have a _____ in their chemical structure.
2. The simplest organic compounds are known as _____.
3. Amino acids are the building blocks of _____.
4. The three major classes of carbohydrates are _____, _____, and _____.
5. Lipids are greasy and insoluble in _____.
6. Inorganic chemistry deals with chemical elements and their compounds, excluding those of _____.
7. Inorganic chemistry is important in various fields including industry, agriculture, and _____.

Exercise 4. Choose the correct answer for each question:

1. Which branch of chemistry deals with carbon-containing compounds?
 - a) Organic chemistry
 - b) Inorganic chemistry
 - c) Analytical chemistry
2. What are the simplest organic compounds called?
 - a) Amino acids
 - b) Proteins
 - c) Hydrocarbons
3. What are the major classes of organic compounds?
 - a) Sugars, starches, and celluloses
 - b) Proteins, carbohydrates, and lipids
 - c) Albumins, globulins, and nucleo-proteins
4. Which class of compounds contains more energy per unit of weight?
 - a) Proteins
 - b) Carbohydrates
 - c) Lipids
5. What is the primary element studied in inorganic chemistry?
 - a) Carbon
 - b) Hydrogen
 - c) Oxygen
6. Inorganic chemistry deals with the transformation of matter accompanied by changes in _____.
 - a) Mass
 - b) Composition
 - c) Volume
7. In which spheres of human activity is inorganic chemistry important?
 - a) Sports
 - b) Medicine
 - c) Music

Exercise 5. Discuss the following questions:

1. Why is carbon considered essential in organic chemistry?
2. How do proteins contribute to the structure of the human body?
3. What are some examples of carbohydrates in daily diet?
4. Why are lipids important for living organisms?
5. How does inorganic chemistry impact various industries?
6. Can you think of any medical applications of inorganic chemistry?
7. What role does chemistry play in technological progress?

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Тема № 14: **Періодична система хімічних елементів**

Мета: Засвоїти новий лексичний матеріал. Робити лексико-граматичний аналіз тексту. Робити усне повідомлення про вченого

Основні поняття: розташування, величина, молекула, співвідношення, валентність, вага

I. План

Знайомство із текстом за темою.

II. Практичні заняття, які виконуватимуться

Exercise 1. Answer the questions.

1. Who was D. Mendeleev?
2. What is the periodic table?
3. When was the periodic table credited?
4. Why are there vacant places in the periodic table?
5. How many elements does the periodic table consist of?

Exercise 2. Determine whether the following statements are true or false:

1. Dmitry Mendeleev invented the periodic table in 1869.
2. Mendeleev classified 56 elements based on their atomic numbers.
3. The periodic table illustrates periodic trends in the properties of elements.
4. Mendeleev arranged elements in the order of decreasing atomic masses.
5. The periodic table contains 117 elements as of January 27, 2008.
6. The layout of the periodic table has remained unchanged since its invention.
7. The periodic table is only used within the field of chemistry.

Exercise 3. Fill in the blanks with the correct words:

1. Dmitry Mendeleev is generally credited with inventing the _____.
2. Mendeleev classified elements based on their _____ and _____ properties.
3. Mendeleev observed that properties of elements recur in a _____ fashion.
4. The properties of elements are periodic functions of their _____.
5. The periodic table consists of vertical _____ and horizontal _____.
6. The periodic table helps scientists predict the possibility of discovering new elements and correct _____.
7. The periodic table is now used in various fields including physics, biology, and _____.

Exercise 4. Choose the correct answer for each question:

1. Who is credited with inventing the periodic table?
a) Albert Einstein
b) Dmitri Mendeleev
c) Isaac Newton
2. How did Mendeleev arrange elements in the periodic table?
a) By decreasing atomic masses

- b) By increasing atomic numbers
 - c) By similar properties
3. What did Mendeleev conclude about the properties of elements?
- a) They are random
 - b) They recur periodically
 - c) They have no relation to atomic masses
4. How many elements does the periodic table contain as of January 27, 2008?
- a) 100
 - b) 117
 - c) 150
5. What does the periodic table provide a framework to classify and compare?
- a) Only chemical elements
 - b) All forms of chemical behavior
 - c) Biological organisms
6. Where is the periodic table used besides chemistry?
- a) Only in physics
 - b) Only in biology
 - c) In various fields including industry
7. What did Mendeleev's periodic table enable scientists to predict?
- a) The end of the periodic trend
 - b) The discovery of new elements
 - c) The destruction of the periodic system

Exercise 5. Discuss the following questions:

1. Why is Mendeleev's periodic table considered a significant scientific achievement?
2. How does the periodic table help scientists understand the properties of elements?
3. What are some practical applications of the periodic table in everyday life?
4. How has the periodic table evolved since Mendeleev's time?
5. Why is it important for scientists to be able to predict the properties of new elements?
6. How does the periodic table contribute to advancements in chemistry?
7. Can you think of any examples where the periodic table has been useful in industry or technology?

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Тема № 15: Хімічні реакції

Мета: Описувати основні властивості хімічних реакцій. Знати терміни, що відносяться до теми. Робити монологічне повідомлення за темою.

Основні поняття: додавання, виключення, швидкість, термін придатності

I. План

Знайомство із текстом за темою.

II. Практичні заняття, які виконуватимуться

Exercise 1. Answer the questions:

1. What is a chemical reaction?
2. What is the mechanism of a reaction?
3. Why is it necessary to know the mechanisms of a reaction?
4. What kind of reactions can you name?
5. What are the common reaction classifications?
6. What is kinetics?

Exercise 2. Decide whether the following statements are true or false based on the text:

1. The study of chemical changes is not relevant to designing chemical plants.
2. Experimental data on reaction rates are essential for estimating the shelf-life of drugs.
3. In pharmacy, it's crucial to understand the mechanisms of drug decomposition.
4. The mechanism of a reaction provides a general overview of the pathway from reactants to products.
5. It's possible to experimentally determine every precise detail of a reaction mechanism.
6. Nucleophilic additions and electrophilic substitutions are not common reaction classifications.
7. Kinetics is not useful for studying reaction mechanisms.

Exercise 3. Complete the sentences with the correct words:

1. The study of chemical changes and reaction rates is essential for designing chemical _____.
2. In pharmacy, it's important to understand how rapidly a drug decomposes and reacts with the _____.
3. The mechanism of a reaction provides a detailed description of the pathway from _____ to _____.
4. While classifying reactions, we consider whether they involve addition, _____, or elimination.
5. Nucleophilic additions and electrophilic substitutions are common classifications based on reagent _____.
6. Kinetics, the study of reaction rates, is a powerful tool for understanding reaction _____.
7. Modern chemists aim to develop detailed mechanistic pictures of reactions using kinetics and structural _____.

Exercise 4. Choose the correct answer for each question:

1. What is an important consideration in designing chemical plants?
 - a) The color of reactants
 - b) The rates of chemical changes
 - c) The pH of the environment

2. Why is it necessary to understand reaction mechanisms in pharmacy?
 - a) To estimate drug shelf-life
 - b) To design chemical plants
 - c) To develop new drugs

3. What is the mechanism of a reaction?
 - a) A detailed description of the reactants
 - b) A step-by-step pathway from reactants to products
 - c) A general overview of the reaction process

4. How do chemists classify reactions?
 - a) Based on color changes
 - b) Based on reactant concentrations
 - c) Based on addition, substitution, or elimination

5. What is an important goal of modern chemists?
 - a) To ignore reaction kinetics
 - b) To develop detailed mechanistic pictures of reactions
 - c) To avoid studying chemical changes

6. What does kinetics study?
 - a) The color of reactants
 - b) The rates of chemical reactions
 - c) The structure of reactants

7. How do chemists use kinetics and structural information?
 - a) To confuse reaction mechanisms
 - b) To develop detailed mechanistic pictures of reactions
 - c) To avoid studying reaction rates

Exercise 5. Discuss the following questions:

1. Why is understanding reaction rates important in pharmacy?
2. How does the study of reaction mechanisms benefit chemical plant design?
3. What role does kinetics play in developing new drugs?
4. Why is it challenging to experimentally determine every detail of a reaction mechanism?
5. How can classification of reactions help chemists understand their behavior?
6. Can you provide examples of nucleophilic additions and electrophilic substitutions in real-life reactions?
7. In what ways can kinetics and structural information be combined to develop detailed mechanistic pictures of reactions?

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