I. Read the text and answer 10 questions to it.

MUMPS

The causative agent is a filtrable virus. It is found in the saliva of patients, where it may be present for at least 24 hours before swelling of the salivary glands develops, and throughout the entire period of glandular enlargement. Spread is by droplet infections or direct contact with materials contaminated with infected saliva. Most cases occur in children between 5 and 15 years of age; the disease is unusual in children under 2 years. Infants up to 10 months ordinarily are immuned. However, the disease may occur at any age, and cases in the older age groups may be seen.

After an incubation period of 14 to 21 days onset is marked by chilly sensations, headache, anorexia and malaise. This is accompanied by a low to moderate fever which may last from 12 to 24 hours before any involvement of the salivary glands. In mild cases, these prodromal symptoms may be absent. Pain on chewing or swallowing is the earliest symptom of parotitis. There is marked sensitivity to pressure over the angle of the jaw. With development of parotitis, the temperature frequently rises to 103 or 104 F. Swelling of the gland reaches its maximum about the 2nd day and is associated with swelling, involving the cheek and area below the ear. In most cases, both parotid glands are involved. Occasionally the submaxillary and sublingual glands also may be swollen, or, more rarely, may be the only glands affected. In such cases, there is swelling of the neck beneath the jaw.

The diagnosis of typical cases during an epidemic is simple, but sporadic cases present a more difficult problem. Swelling of the parotid or other salivary glands due to the mumps virus must be distinguished from: (1) bacterial parotid involvement occuring in streptococcal throat infections, diphtheria, or debilitated patients with poor oral hygiene, typhoid or typhus fever; (2) malignant tumors of the salivary glands; (3) postoperative parotitis.

In uncomplicated mumps, prognosis is extent. However, relapses may occur occasinally after about 2 weeks. In complicated cases, deafness or facial paralysis has been known to occur following involvement of the nervous system.

1. The virus which causes mumps can be found in the urine of the patients:

A. False
B. True
C. —
D. —
E. —

2. The virus is spreading with the saliva of the people, who are sick:

A. True
B. False
C. —
D. —
E. —

3. Elder people are immune to mumps:

A. False
B. True
C. —
D. —
E. —

4. Only parotid salivary glands can be affected in the case of mumps:

A. False
B. True
C. —
D. —
E. —

5. Usually, only one parotid gland is affected by the disease:

A. False
B. True
C. —
D. —
E. —

6. It is always easy to diagnose this disease:

A. False
B. True
C. —
D. —
E. —

7. In some cases, mumps must be distinguished from diphtheria:

A. True
B. False
C. —
D. —
E. —

8. Mumps can be complicated with deafness:

A. True
B. False
C. —
D. —
E. —

9. Choose the correct statement:

A. The first symptom of parotitis is a pain when swallowing
B. The first symptom of parotitis is a headache
C. The first symptom of parotitis is fever
D. —
E. —

10. Choose the correct statement:

A. Most cases of the disease occur in children older than five years old
B. Most cases of the disease occur in infants under ten months
C. Most cases of the disease occur in children younger than two years old
D. —
E. —

11. A 50-year-old patient in a poor condition was presented to the hospital. Objectively, the skin and visible mucous membranes are cyanotic, arterial blood saturation — 88%, NiBP — 90/60 mm Hg, pulse is 117 per minute, respiratory rate is 22 per minute. From the history it is known that the patient suffers from chronic heart failure. Which of the following types of hypoxia is most likely to develop in this case?

A. Circulatory
B. Anemic
C. Hemic
D. Tissue
E. Hypoxic

12. The patient is presented to the hospital with the phenomena of growing respiratory failure. He has clinical signs of bilateral subtotal pneumonia. The clinical diagnosis is confirmed by X-ray examination. What type of respiratory failure does this patient most likely have?

A. Restrictive
B. Obstructive
C. Central
D. Peripheral
E. Thoracic diaphragm

13. The biochemist investigates solution composition. After evaporation process dry sediment is received. This sediment turns previously colorless burner flame into yellow and into violet when it is seen through the blue glass. Which of the following cations does this dry sediment contain?

A. Na^+, K^+
B. Ca^{2+}, K^+
C. Na^+ , Sr^{2+}
D. Li^+, Ba^{2+}
E. Na^+, Ca^{2+}

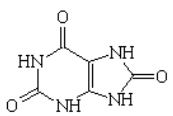
14. Thermodynamic calculations are used to determine the possibility and direction of a spontaneous process. In an isolated system for this purpose the change in thermodynamic function is used. Name this function:

A. Entropy
B. Gibbs energy
C. Helmholtz energy
D. Internal energy
E. Enthalpy

15. The researcher while conducting the qualitative analysis that involves sulfates precipitation of the third analytical group cations (Ca^{2+}, Sr^{2+}, Ba^{2+}) has to reduce solubility of sulfates. What substance should he use for this purpose?

A. Ethyl alcohol
B. Distilled water
C. Benzene
D. Chloroform
E. Amyl alcohol

16. Patients with gout have an increased concentration of acid, the chemical formula of which is presented below, in the blood. Also, increased level of this acid promotes the formation of stones in the kidneys and leads to a number of pathological medical conditions. What substance is the precursor to the described acid?



A. Purine
B. Indole
C. Pyrazine
D. Pyrazole
E. Pyridine

17. Surfactants are compounds that lower the surface tension (or interfacial tension) between two liquids, between a gas and a liquid, or between a liquid and a solid. Which of the following substances exhibits the properties of a surfactant at the air-water interface?

A. Valeric acid
B. HCl
C. $NaOH$
D. Urea
E. —

18. The student has a task to identify the primary amino group. Which of the following reactions he needs to use for this purpose?

A.

$$H_3C - CH_2 - NH_2 \xrightarrow{CHCl_3,KOH}$$

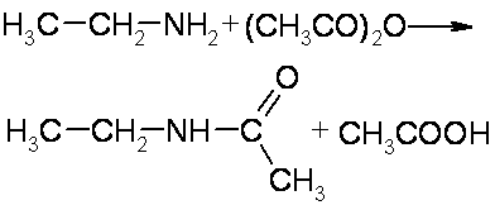
$$H_3C - CH_2 - N^+ \equiv C^- + KCl + H_2O$$

B.

$$H_3C - CH_2 - NH_2 + H_3C - I \rightarrow$$

$$H_3C - CH_2 - NH - CH_3 + HI$$

C.



D.

$$H_3C - CH_2 - NH_2 + HCl \rightarrow$$

$$H_3C - CH_2 - NH_3^+ Cl^-$$

E.

$$H_3C - CH_2 - NH_2 \xrightarrow{O_3} H_3C - CH_2 - NO_2$$

19. The laboratory assistant while doing his work violated safety measures and took off protective gloves. A small amount of concentrated hydrochloric acid got on his forearm. He developed burning pain, heat, redness, and swelling in the injured area. These signs indicate the following process:

A. Inflammation
B. Tumor
C. Embolism
D. Thrombosis
E. Lymphostasis

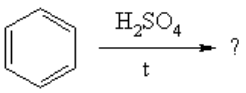
20. In the microbiological laboratory during the experiment, the resistance of microorganisms to the influence of various adverse factors in the natural environment was investigated. What is the result of the effect of high temperatures on a microbial cell?

A. Irreversible degradation of all cellular structures
B. Mutagenic effect
C. Transition into anabiosis state
D. Albuminolysis
E. Fats saponification

21. The student is studying a plant organ with radial symmetry, unlimited growth and positive geotropism. It provides nourishment, vegetative reproduction and plant fastening in the soil. Which of the following is described?

A. Root
B. Stem
C. Leaf
D. Rhizome
E. Seed

22. Sulfurization of benzene, as well as other aromatic hydrocarbons, is one of the most important reactions in organic chemistry, since its products are widely used in industry. Which of the following are the possible products of benzene sulfation reaction?



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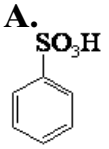

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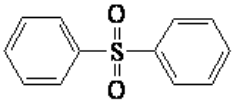

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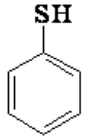

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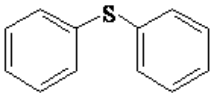

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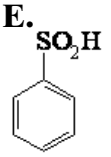
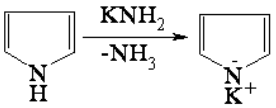


23. The chemist needs to prove acid properties of pyrole. What is the most suitable reaction for this purpose?

A.



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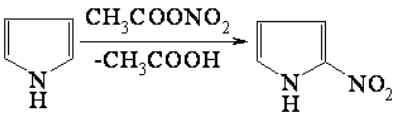

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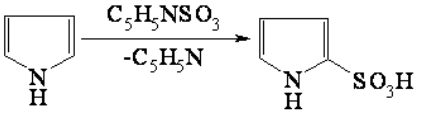

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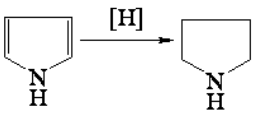

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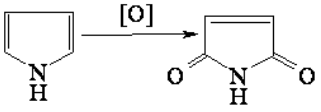

24. The biological study of spores and pollen revealed tetrahedral spores with a semi-circular base and reticular surface in the pollen. There spores belong to:

A. *Lycopodiophyta*
B. *Equisetiphyta*
C. *Bryophyta*
D. *Polypodiophyta*
E. *Pinophyta*

25. A lot of peptides involved in the regulation of various biological processes are produced in the human body. They have high physiological activity. Which biologically active peptide is one of the main antioxidants and performs coenzyme function?

A. Glutathione
B. Bradykinin
C. Oxytocin
D. Liberin
E. Anserine

26. A study of the microbiological purity of tablet formulations is conducted on the production site. After cultivating samples on mannitol salt agar, golden-yellow colonies grow up. Microscopic examination of colonies establishes the presence of gram-positive bacteria of spherical shape, located in clusters; microorganisms has the ability to coagulate the plasma. The pure culture of which of the following bacteria is discovered?

A. *Staphylococcus aureus*
B. *Enterobacteriaceae*
C. *Staphylococcus epidermidis*
D. *Staphylococcus saprophyticus*
E. *Pseudomonas aeruginosa*

27. A sample of water used in the manufacture of medicines is delivered to the laboratory for sanitary-virological research. Detection of which of the following group of viruses would indicate fecal contamination of the water and the need for additional cleaning?

A. Picornaviridae
B. Herpesviridae
C. Orthomyxoviridae
D. Retroviridae
E. Flaviviridae

28. A 49-years-old woman who suffers from diabetes for a long time have weakness, paleness, palpitations, anxiety, double vision, numbness of the lips and the tip of the tongue after insulin administration. The blood glucose level is 2.5 mmol/l. Which of the following complications does this patient develop?

A. Hypoglycemic coma
B. Hyperosmolar coma
C. Hyperglycemic coma
D. Hyperketonemic coma
E. Uremic coma

29. Morphological description of common periwinkle shows that it has shoot that trails on the ground and takes root. This plant has the following type of shoot:

A. Creeping
B. Recumbent
C. Twining
D. Scandent
E. Tenent

30. In order to carry out the silver cations identification, HCl was added to the solution. Later, the formed solution was followed by adding the solution of ammonia. Specify which of the below-

mentioned compounds are formed in such case?

A. $[Ag(NH_3)_2]Cl$
B. $[Ag_2(NH_3)_3]Cl$
C. $AgOH$
D. $AgCl$
E. $[Ag(NH_3)_3]Cl$

31. In a chemico-analytical laboratory the dispensing chemist studies the solution of anion mixture. When antipyrin solution is added to the solution, it becomes emerald-green in color. This analytical effect can prove the presence of certain anions. What anions are present in the primary solution?

A. Nitrite
B. Nitrate
C. Acetate
D. Tartrate
E. Citrate

32. In laboratory studies and in manufacture and essential oils, alkaloids, antibiotics, and other medical substances are being isolated and purified with selective solvents. This method can also be used to isolate a pure substance from the mixture or to continuously remove one of the reaction products from the mixture during the synthesis. What is the name of the described method?

A. Extraction
B. Sedimentation
C. Coagulation
D. Flocculation
E. Flotation

33. Permanganametometry is a titrimetric method for the determination of substances based on oxidation reactions involving permanganate ions. Which of the following are the standard solutions that are used according to this method for the quantitative determination of oxidants by reverse titration method?

A. Potassium permanganate, iron (II) sulfate
B. Potassium dichromate, sodium thiosulfate
C. Potassium bromate, sodium thiosulfate
D. Potassium iodate, sodium thiosulfate
E. Cerium (IV) sulfate, iron (II) sulfate

34. Etiological factors of infectious diseases can be infectious agents with diverse ultrastructure. Which of the following groups does not have cellular structure, protein synthesis, enzymatic and energy systems?

A. Viruses
B. Fungi
C. Bacteria
D. Protozoa
E. Rickettsia

35. Streptomycin like other aminoglycosides, by binding to the 30S subunit of ribosomes, prevents the attachment of formylmethionyl-tRNA. What process is being disrupted as a result of this effect?

A. Translation initiation
B. Translation termination
C. Transcription initiation
D. Transcription termination
E. Replication initiation

36. Each root site performs a certain function due to the special cells that form tissues. Zones allow growing in the earth, sucking substances out of the soil and carrying them to all other plant parts. Which of the following types of conducting beams are inherent in all root zones of single-seeded plants?

A. Radical
B. Central phloem (Amphivasal)
C. Central xylem (Amphicribal)
D. Bilateral
E. Collateral

37. A poultry farm worker, who consumes 5 or more raw eggs daily, developes lethargy, drowsiness, muscle pain, hair loss, seborrhea. What vitamin deficiency can lead to previously mentioned symptoms?

A. H (biotin)
B. C (ascorbic acid)
C. A (retinol)
D. B_1 (thiamine)
E. B_2 (riboflavin)

38. In order to facilitate usage and achievement of necessary therapeutic effect, the drug or medicinal plant material is given a certain dosage form. Indicate the dosage form in the form of a free-disperse system:

A. Emulsion
B. Gel
C. Jelly
D. Diaphragm
E. Membrane

39. Common nettle, common hops, black elderberry belong to a group of plants, which require a large amount of nitrogen in the soil to ensure their normal growth. What is the name of this group of plants?

A. Nitrophytes
B. Nitrophobes
C. Calciphiles
D. Calciphobes
E. Halophytes

40. On X-ray examination of the 59-year-old patient, in the lower lobe of the right lung there was detected a distinct shadow, differential for tumor. It was pre-determined that the tumor is benign. Which of the following features characterizes the tumor as benign?

A. Expansive growth
B. Metastasis
C. Cancer cachexia
D. Invasion in surrounding tissues
E. Infiltrating growth

41. In medical practice barbiturates are used as sleeping pills. These substances act similar to rothenone and are inhibitors of tissue respiration. The mechanism of their action takes place on the enzymatic level. Which of the following enzymes do these substances inhibit?

A. NADH-coenzyme Q reductase
B. Cytochrome oxidase
C. Cytochrome C reductase
D. Adenosine triphosphate synthetase
E. Succinate dehydrogenase

42. It is the process of separating molecules in solution by the difference in their rates of diffusion through a semipermeable membrane. Its most common application is the removal of unwanted small molecules such as salts, reducing agents, or dyes from larger macromolecules such as proteins, DNA, or polysaccharides. Which of the following is described above?

A. Dialysis
B. Electrodialysis
C. Ultrafiltration
D. Decantation
E. Compensatory dialysis

43. There are certain patterns of chemical and biological processes occurring with the drug in the body. Reduced absorption of tetracycline when it is co-administered with antacids is an example of:

A. Pharmacokinetic incompatibility
B. Pharmaceutical incompatibility
C. Pharmacodynamic incompatibility
D. Synergism
E. Functional antagonism

44. A 38-year-old patient is on inpatient treatment for the exacerbation of chronic bronchitis. In the process of pharmacotherapy the patient has developed dyspeptic disorders, photodermatitis, and impaired liver function. Which drug is most likely to be the cause of these signs?

A. Doxycycline
B. Paracetamol
C. Ascorbic acid
D. Acetylcysteine
E. Codeine phosphate

45. The patient, who suffers from rheumatoid arthritis and concomitant duodenal ulcer should be prescribed a non-steroidal anti-inflammatory drug. What drug is most suitable in this case?

A. Celecoxib
B. Acetylsalicylic acid
C. Paracetamol
D. Metamizole
E. Diclofenac sodium

46. The patient with acute heart failure is administered to the nearby hospital. The emergency doctor prescribed corglicon for the treatment of this condition. Which route of administration is the most effective in this case?

A. Intravenous
B. Intramuscular
C. Subcutaneous
D. Oral
E. Inhalational

47. The second stage of detoxification involves binding certain chemical compounds to functional groups of toxins. Name one such compound:

A. Glucuronic acid
B. Higher fatty acids
C. Cholesterol
D. Glucose
E. Pyruvate

48. Different structures of the bacterial cell perform different special functions. This component provides the adaptive

capabilities of the bacterium and its protection against the adverse conditions of the environment. What component is it?

A. Spores
B. Flagella
C. Capsule
D. Cilia
E. Inclusions

49. A 21-year-old patient during routine examination by an ophthalmologist was diagnosed with a visual impairment — gemeralopia («night blindness»). What drug should she be prescribed to reduce the signs of this condition?

A. Retinol acetate
B. Ergocalciferol
C. Chloropyramine
D. Cholecalciferol
E. Nitroglycerin

50. In practical classes the group of students have to explore the chemical structure of glucose molecule. Which of the following suits most for simultaneous detection of aldehyde group and glycol fragment in previously mentioned molecule?

A. $Cu(OH)_2$
B. Br_2
C. $AlCl_3$
D. $FeCl_3$
E. $KMnO_4$