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

Edward Jenner

Edward Jenner was born in 1749. He was an English physician, the discoverer of vaccination. Jenner studied medicine in London. He began his practice in 1773 when he was twenty-four years old.

Edward Jenner liked to observe and investigate ever since he was a boy. His persistent scientific work resulted in the discovery of vaccination against smallpox. Today cases of smallpox are very rare because every infant when it is about a year old is vaccinated against this disease. The vaccination is effective for a prolonged period of time.

In Jenner's days, one out of every five persons in London carried the marks of this disease on his face. But there were few people who recovered from the disease because in the 18th century smallpox was one of the main causes of death.

The disease had been common for centuries in many countries of Asia. The Turks had discovered that a person could be prevented from a serious attack of smallpox by being infected with a mild form of the disease.

One day Jenner heard a woman say: «I cannot catch smallpox, I've had cowpox». That moment led to Jenner's continuous investigations and experiments.

The first child whom Jenner introduced the substance from cowpox vesicles obtained from the wound of a diseased woman was Jimmy Phipps. It was in 1796. For the following two years, Jenner continued his experiments. In 1798 he published the report on his discovery. He called his new method of preventing smallpox «vaccination», from the Latin word vacca, that is «a COW».

At first, people paid no attention to his discovery. One doctor even said that vaccination might cause people to develop cow's faces.

But very soon there was no part of the world that had not taken up vaccination. Thousands of people were given vaccination and smallpox began to disappear as if by magic.

1. The invention of Jenner became very popular right away.

A. False
B. True
C. —
D. —
E. —

2. Back in the 18th century it was difficult to recover from smallpox.

A. True
B. False
C. —
D. —
E. —

3. Jenner met the woman, who discovered vaccination from smallpox.

A. False
B. True
C. —
D. —
E. —

4. Smallpox is still common

nowadays, but less than in the 18th century.

A. False
B. True
C. —
D. —
E. —

5. Jenner's vaccine helped to treat smallpox.

A. False
B. True
C. —
D. —
E. —

6. The vaccine was made from the blood of people who recovered from smallpox.

A. False
B. True
C. —
D. —
E. —

7. The vaccine is based on the substance from vesicles which appeared as a result of cowpox.

A. True
B. False
C. —
D. —
E. —

8. Jenner's vaccine had one side effect — people were developing cow's faces.

A. False
B. True
C. —
D. —
E. —

9. Choose the correct statement.

A. The vaccine is effective for a long time.
B. Adult people cannot get a smallpox
C. Children get vaccinated from smallpox in school-age
D. —
E. —

10. Choose the correct statement.

A. When he was twenty-four, Edward Jenner started to work as a doctor
B. When he was twenty-four, Edward Jenner created a vaccine
C. When he was twenty-four, Edward Jenner had smallpox
D. —
E. —

11. What titrimetric method of analysis uses both external and internal indicators?

A. Nitritometry
B. Alkalimetry
C. Complexonometry
D. Permanganatometry
E. Argentometry

12. What common property of cation compounds Al^{3+}, Zn^{2+}, Cr^{3+}, Sn^{2+} unites them within the IV analytical group (acid-base classification)?

A. Amphotericity of hydroxides
B. Insolubility of salts in water
C. Good solubility of some salts
D. Solubility of hydroxides in acids
E. Solubility of hydroxides in an excess ammonia solution

13. A 10-year-old child has the height of 178 cm and the weight of 64 kg. What endocrine gland is dysfunctional in the child, causing this condition?

A. Pituitary gland
B. Thyroid gland
C. Gonads
D. Adrenal glands
E. Parathyroid glands

14. What indicator is used to quantify sodium carbonate in a medicine by means of acid-base titration?

A. Methyl orange
B. Murexide
C. Methylene blue
D. Diphenylamine
E. Ferroin

15. What substance is used as an indicator in the back titration of an aqueous solution of acetic acid?

A. Phenolphthalein
B. Diphenylamine
C. Diphenylcarbazone
D. Eriochrome black T
E. Murexide

16. What adsorbent is used as a suspension to relieve the intoxication caused by alkaloid poisoning?

A. Activated charcoal
B. Silica gel
C. Bentonite
D. Kaolin
E. Starch

17. What is the vapor pressure of a liquid at its boiling point?

A. Equal to atmospheric pressure
B. Minimum
C. Maximum
D. Equal to saturated vapor pressure at room temperature
E. Equal to saturated vapor pressure at 273 K

18. Microscopy of the smears obtained from the coating on the patient's tonsils was stained according to the Neisser technique. The staining revealed thin yellow bacilli with dark blue grains at their ends, arranged in the form of the Roman numeral V. What pathology can be suspected based on the results of microscopy?

A. Diphtheria
B. Measles
C. Tuberculosis
D. Pertussis
E. Influenza

19. The therapeutic properties of activated charcoal are due to its large specific surface area. Name the phenomenon, when gas absorption occurs only at the surface of a solid object:

A. Adsorption
B. Adhesion
C. Desorption
D. Cohesion
E. Recuperation

20. When harvesting herbal raw material of calendula and chamomile, their inflorescences are being collected. What type of inflorescence is it?

A. Flat capitulum
B. Spike
C. Corymb
D. Umbel
E. Round capitulum

21. After the examination, the patient was diagnosed with typhus. What is the route of transmission of this disease?

A. Vector-borne transmission
B. Vertical transmission
C. Fecal-oral transmission
D. Airborne droplet transmission
E. Parenteral transmission

22. Serology is the leading method of syphilis diagnostics. What test is used to diagnose this disease?

A. Wassermann test
B. Wright test
C. Widal test
D. Haddelson test
E. Gruber test

23. What is formed as a result of benzene sulfonation?

A.

B.

C.

D.

E.

24. Under conditions of prolonged intoxication, a significant decrease in the activity of aminoacyl-tRNA synthetases can be observed. What metabolic process is disrupted in this case?

A. Protein biosynthesis
B. DNA replication
C. DNA repair
D. Genetic recombination
E. RNA processing

25. A woman, who works at a factory that produces phenylhydrazine, came to a hospital with complaints of general weakness, dizziness, and drowsiness. Her blood has signs of anemia with high levels of reticulocytosis, anisocytosis, and poikilocytosis; isolated normocytes are present in the woman's blood. What type of anemia is it?

A. Hemolytic anemia
B. Iron-deficiency anemia
C. Protein-deficiency anemia
D. Aplastic anemia
E. Metaplastic anemia

26. Preventive examination revealed an enlargement of the patient's thyroid gland, exophthalmos, high body temperature, and an elevated heart rate of 110/min. What hormone levels should be measured in the patient's blood in this case?

A. Thyroxine
B. Testosterone
C. Glucagon
D. Insulin
E. Cortisol

27. To what electrode will the protein particle move during electrophoresis, if its isoelectric point is 4.0 and the pH of the solution is 5.0?

A. To the anode
B. To the cathode
C. First to the cathode, and then to the anode
D. First to the anode, and then to the cathode
E. There will be no movement

28. Proteins are the catalysts of biochemical processes. What type of homogeneous catalysis includes the processes that involve proteins?

A. Enzymatic catalysis
B. Acid-base catalysis
C. Redox catalysis
D. Coordination catalysis
E. Gas phase homogeneous catalysis

29. What cations belong to the IV analytical group according to the acid-base classification?

A. Aluminum, zinc, chromium(II), tin(II), tin(IV), arsenic(III), arsenic(V)
B. Calcium, strontium, barium, potassium, bismuth
C. Magnesium, calcium, strontium, barium
D. Silver, lead, nickel, potassium, barium, bismuth
E. Sodium, potassium, ammonium, silver, lead

30. A human is immune to the plague of cattle and dogs. What type of immunity is it?

A. Innate
B. Natural active
C. Natural passive
D. Artificial active
E. Artificial passive

31. In the patient, a gallstone lodged in the common bile duct has blocked the flow of bile into the intestine. What digestive process will be disturbed in this case?

A. Digestion of fats
B. Absorption of proteins
C. Digestion of carbohydrates
D. Absorption of carbohydrates
E. Digestion of proteins

32. Which of the listed species of medicinal plants is considered to be a weed?

A. *Plantago major*
B. *Papaver somniferum*
C. *Mentha piperita*
D. *Convallaria majalis*
E. *Salvia officinalis*

33. Early-flowering rhizomatous ephemeroids include: *Tussilago farfara*, *Convallaria majalis*, and:

A. *Adonis vernalis*
B. *Carum carvi*
C. *Allium cepa*
D. *Chamomilla recutita*
E. *Thymus serpyllum*

34. The majority of live vaccines are made from microbes with reduced virulence. What is the name of such vaccines?

A. Attenuated vaccines
B. Denatured vaccines
C. Anatoxin vaccines
D. Adsorbed vaccines
E. Adjuvant vaccines

35. In *E. coli* cells, the synthesis of pyrimidine nucleotides occurs according to the scheme of the metabolic pathway: $CO_2 + NH_3$ + 2ATP> S1> S2> UTP> CTP. When CTP concentration in the cell increases, the synthesis of pyrimidine nucleotides stops. What type of regulation is described here?

A. Allosteric regulation
B. Partial proteolysis
C. Enzyme molecule phosphorylation
D. Attachment of inhibitor proteins
E. Detachment of inhibitor proteins

36. After a physical exertion, a patient developed an angina pectoris attack caused by myocardial ischemia. What definition most accurately describes the concept of ischemia?

A. Discrepancy between the blood supply to the tissues and the need for it
B. Decreased erythrocyte count in the blood
C. Dilation of arterioles
D. Oxygen deficiency in the circulatory system
E. Increased oxygen delivery to tissues

37. A patient, who was prescribed famotidine for peptic ulcer disease, came to a pharmacy. What mechanism underlies the action of this medicine?

A. H_2-histamine receptors blockade
B. H_1-histamine receptors blockade
C. Muscarinic cholinoreceptor blockade
D. Inhibition of the H^+K^+ ATPase activity
E. Cholinergic receptors blockade in the sympathetic ganglia

38. What drug has a hypoglycemic effect due to stimulation of pancreatic beta cells?

A. Glibenclamide
B. Prednisolone
C. Adrenaline hydrochloride (epinephrine)
D. Retabolil (nandrolone)
E. Heparin

39. A patient has been warned that the medicine prescribed to him can cause a cough. Name this medicine:

A. Lisinopril
B. Clophelin (Clonidine)
C. Phenyhydin (Nifedipine)
D. Dichlothiazide (Hydrochlorothiazide)
E. Metoprolol

40. In cases of severe pancreatitis, physicians usually prescribe the drugs that help prevent pancreatic autolysis. These drugs inhibit the following type of enzymes:

A. Proteases
B. Lipases
C. Phosphatases
D. Dehydrogenases
E. Amylases

41. A 37-year-old man developed leg edema after prolonged fasting. What pathogenetic factor plays the leading role in the development of edema in this case?

A. Decreased oncotic blood pressure
B. Decreased hydrostatic blood pressure
C. Decreased osmotic blood pressure
D. Increased oncotic pressure in the tissues
E. Increased osmotic pressure of interstitial fluid

42. *Glycyrrhiza glabra L.*, a valuable medicinal plant, is widely used in official and folk medicine. What part of the plant is harvested?

A. Roots with rhizomes
B. Leaves
C. Inflorescences
D. Grass
E. Seeds

43. A man developed agranulocytosis after pneumonia treatment with sulfonamides. Antibodies to neutrophils were detected in the patient's blood. This pathology belongs to the following type of allergic reactions:

A. Cytotoxic
B. Immune complex
C. Anaphylactic
D. Cell-mediated
E. Reactive

44. What reagents produce a reaction that follows the free

radical (SR) mechanism?

A. Ethane and chlorine in the light
B. Benzene and chlorine in the presence of $AlCl_3$
C. Ethylene and chlorine
D. Ethanol and hydrogen chloride
E. Ethane and oxygen

45. What pair of compounds can be classified as functional group isomers?

A. Propanal and propanone
B. Pentene-1 and pentene-2
C. Butane and isobutane
D. Hexane and cyclohexane
E. Benzene and methylbenzene

46. CH_3-CH_2-OH and CH_3-O-CH_3 are a pair of compounds that can be classified as isomers of the following type:

A. Functional group isomers
B. Mirror (optical) isomers
C. Geometric (cis-trans) isomers
D. Carbon chain isomers
E. Tautomers

47. Which compound of those listed below is an alicyclic hydrocarbon?

A. Cyclohexene
B. Phenanthrene
C. Naphthalene
D. Benzene
E. Anthracene

48. Which of the listed plants is a bush with imparipinnate leaves, decussate leaf arrangement, and juicy black fruits?

A. *Sambucus nigra*
B. *Chelidonium majus*
C. *Ledum palustre*
D. *Arctostaphylos uva-ursi*
E. *Urtica dioica*

49. What cardiac glycoside is obtained from lily of the valley?

A. Corglycon
B. Adoniside
C. Strophanthin K
D. Celanid (Lanatoside C)
E. Digitoxin

50. What drug inhibits cholesterol synthesis in the liver?

A. Atorvastatin
B. Fenofibrate
C. Colestipol
D. Parmidinum
E. Probucol