

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 occurring in streptococcal throat infections, diphtheria, or debilitated patients with poor oral hygiene, typhoid or typhus fever; (2) malignant tumors of the salivary glands; (3) post-operative parotitis.

In uncomplicated mumps, prognosis is extent. However, relapses may occur occasionally 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 43-year-old man seeks evaluation at an emergency department with complaints of fever with chills, malaise, diffuse abdominal pain for over a week, diarrhea and loss of appetite. He says that his symptoms are progressively getting worse. He recalls that the fever began slowly and climbed its way up stepwise to the current 39.8°C. His blood pressure is 110/70 mm Hg. A physical exam reveals a coated tongue, enlarged spleen and rose spots on the abdomen. Serologic study shows the agglutinin O titre of 1:200 by the Widal test. Which of the following is the most likely causative organism for this patient's condition?

- A. *Salmonella typhi*
- B. Enterohemorrhagic *E. coli*
- C. *Vibrio cholerae*
- D. *Leptospira interrogans*
- E. *Mycobacterium tuberculosis*

12. A patient was hospitalized in a comatose state. The patient has a 5-year-long history of diabetes mellitus type 2. Objectively the patient's respiration is noisy, deep, with acetone breath odor. Blood glucose is 15.2 mmol/L, ketone bodies — 100 μmol/L. These signs are characteristic of the following diabetes complication:

- A. Ketoacidotic coma
- B. Hepatic coma
- C. Hyperglycemic coma
- D. Hypoglycemic coma
- E. Hyperosmolar coma

13. A 45-year-old woman has an attack of atrial fibrillation. She suffers from stage II essential hypertension. What is the drug of choice for stopping this attack?

- A. Anaprilin (Propranolol)
- B. Sustac forte (Nitroglycerin)
- C. Potassium chloride
- D. Strophanthin
- E. Lidocaine

14. A 7-week-old infant is brought to the pediatrician due to feeding difficulty for the last 4 days. She has been drinking very little breast milk and stops feeding as if she is tired, only to start sucking again after a few minutes. On chest auscultation, bilateral wheezing is present. A cardiac murmur starts immediately after the onset of the first heart sound (S1), reaching its maximal intensity at the end of systole, and waning during late diastole. The murmur is best heard over the second intercostal space and radiates to the left clavicle. The first heart sound (S1) is normal, while the second heart sound (S2) is obscured by the murmur. The pediatrician suspects a patent ductus arteriosus. Communication between which of the following arteries is the most likely cause of hemodynamic instability?

- A. Pulmonary artery and aorta
- B. Pulmonary artery and pulmonary veins
- C. Superior vena cava and aorta
- D. Superior vena cava and pulmonary artery
- E. Aorta and pulmonary veins

15. A newborn delivered at 33 weeks of gestation has a respiratory rate of 70/min. and heart rate of 148/min. 2 hours after birth. He is grunting and has intercostal and subcostal retractions. He has peripheral cyanosis as well. An immediate chest radiograph is taken which shows a fine reticular granulation with ground glass opacity on both lungs. A neonatologist suggests respiratory distress syndrome due to surfactant deficiency. Which of the following is the most likely mechanism of these clinical and imaging findings?

- A. Tendency of alveoli to collapse
- B. Decreased airways resistance
- C. Decreased respiratory muscle work
- D. Increased lung ventilation
- E. —

16. A 14-year old girl presents to the emergency department for evaluation of an «infected leg». She states there is no history of trauma but mentions she had a history of sickle cell disease. On physical examination, her upper part of right shin is very painful, red, swollen and hot. Her temperature is 39.2°C. An X-ray shows focal bony lysis and loss of trabecular architecture in the metaphysis of right tibia. Increased activity of which of the following cells is the most likely cause of bone reabsorption in this patient?

- A. Osteoclasts
- B. Chondroblasts
- C. Osteocytes
- D. Osteoblasts
- E. Chondrocytes

17. A 59-year-old man has signs of jaundice and portal hypertension. Histology of the puncture biopsy material obtained from the liver reveals the following: lobar and trabecular structure is disturbed, a number of hepatocytes have signs of fatty degeneration, porto-portal connective tissue septa and pseudolobules with periportal lymphoid-macrophageal

infiltration are being formed. What liver disease is described?

- A. Hepatic cirrhosis
- B. Alcoholic hepatitis
- C. Chronic hepatitis
- D. Viral hepatitis
- E. Toxic dystrophy

18. A 65-year-old patient with a history of coronary artery disease presents to the doctor's office complaining of dizziness and sudden onset of a «bluish discoloration» of his skin. Physical examination reveals cyanotic patient. His blood pressure is 100/50 mm Hg, heart rate — 110/min., respiratory rate — 14/min. Laboratory testing is significant for methemoglobinemia. Which of the following medications did this patient most likely misuse?

- A. Nitrovasodilator
- B. α -adrenoreceptor antagonists
- C. Calcium channel blockers
- D. Adenosine
- E. Smooth muscle relaxant

19. A group of researchers aimed to study cardiac physiology found that overstretching of atria in the heart leads to decreased sodium reabsorption in the distal convoluted tubule and increase in glomerular filtration rate. Which of the following is the most likely cause of physiologic effects discovered by researchers?

- A. Natriuretic peptide
- B. Aldosterone
- C. Renin
- D. Angiotensin
- E. Antidiuretic hormone

20. A male neonate born to a 24-year-old, who was pregnant for the first time, had jaundice at 8 hours of life. The neonate's red blood cell type was A+, while the mother's RBC type was O+. Laboratory studies revealed elevated titer of mother's anti-A antibody, normal erythrocyte glucose-6-phosphate and negative sickle cell test. The infant's hemoglobin was 106 g/L. Which of the following is the most likely cause of infant's jaundice?

- A. Hyperbilirubinemia
- B. Glucose-6-phosphate dehydrogenase (G6PD) deficiency
- C. Sickle cell disease
- D. Rh incompatibility
- E. Decrease in hemoglobin level

21. A 78-year-old woman presents to the emergency department for fever and generalized malaise. Her symptoms began several days ago, when she noticed pain with urination and mild blood in her urine. Earlier this morning she experienced chills, flank pain and mild nausea. Her temperature is 38.7°C, blood pressure is 140/80 mm Hg, heart rate is 98/min. Later she dies of unknown cause. At autopsy, her kidney is swollen with punctate abscesses that outlined by a thin red margin (signs of marginal vascular dilation). Microscopic observation reveals a large number of neutrophils. Which of the following is the most likely diagnosis?

- A. Acute pyelonephritis
- B. Acute glomerulonephritis
- C. Amyloidosis
- D. Polycystic kidney disease
- E. Nephrolithiasis

22. During the surgery on the small intestine the surgeon revealed an area of the mucous membrane with a single longitudinal fold among the circular folds. Which portion of the small intestine is this structure typical for?

- A. *Pars descendens duodeni*
- B. *Pars horizontalis duodeni*
- C. *Pars ascendens duodeni*
- D. jejunum
- E. *Distal ileum*

23. A patient complains of pain in the right lateral abdomen. Palpation revealed a dense, immobile, tumor-like formation. A tumor is likely to be found in the following part of the digestive tube:

- A. *Colon ascendens*
- B. *Colon transversum*
- C. *Colon descendens*
- D. *Colon sigmoideum*
- E. *Caecum*

24. A 40-year-old woman dies of intracerebral hemorrhage after the hypertensive emergency. During an

autopsy, the pathologist reveals severe obesity, excess of body hair and wide purplish stria on the abdomen. Microscopic examination of pituitary gland reveals hyperplastic acini populated by a homogenous cluster of deeply basophilic cells. Which of the following was the most likely underlying disease?

- A. Cushing disease
- B. Arterial hypertension
- C. Sheehan's syndrome
- D. Hyperthyroidism
- E. —

25. An unidentified surgical specimen is received for histopathologic analysis. A portion of the specimen is cut and stained with hematoxylin and eosin. Under the microscope, you see an organ encapsulated by dense connective tissue that extends to the deeper areas by way of the trabecular extensions. The organ can be subdivided into two regions: a cortex with lymphoid nodules and medulla with medullary cords populated by plasma cells, B-cells and T-cells. Which of the following structures is most likely the origin of this surgical specimen?

- A. Lymph node
- B. Thymus
- C. Spleen
- D. Bone marrow
- E. Tonsils

26. What diagnostic method should be used in industry to test the raw leather for presence of *B. anthracis*?

- A. Ascoli's thermoprecipitation test
- B. Microscopy with Burry-Gins stain
- C. Microscopy with Aujeszky stain
- D. Bacteriological analysis
- E. Serological test

27. A patient with chronic bronchitis was prescribed a drug with mucolytic action. Name this drug:

- A. Ambroxol
- B. Anaprilin (Propranolol)
- C. Atropine sulfate
- D. Magnesium sulfate
- E. Paracetamol

28. A patient suffers from acute cardiopulmonary failure with pulmonary

edema. What diuretic should be prescribed in the given case?

- A. Furosemide
- B. Triamterene
- C. Spironolactone
- D. Dichlothiazidum (Hydrochlorothiazide)
- E. Diacarb (Acetazolamide)

29. The key reaction of fatty acid synthesis is production of malonyl-CoA. What metabolite is the source of malonyl-CoA synthesis?

- A. Acetyl-CoA
- B. Succinyl-CoA
- C. Acyl-CoA
- D. Malonate
- E. Citrate

30. A team of medical students is performing research on phases of cell cycle. During one of the mitotic phases the cell is nearly done dividing, the chromosomes decondense and two nuclei begin to form around them. Which of the following phases most likely takes place in the cell?

- A. Telophase
- B. Prophase
- C. Metaphase
- D. Anaphase
- E. —

31. A mother of a 4-month-old male infant brought him to pediatrician with complaints of food rejection and weight loss. He started having trouble latching onto his bottle. He has also become extremely lethargic. Examination reveals diminished muscle tone in all four limbs, and hepatosplenomegaly. An ophthalmoscopic exam reveals macular cherry red spots. During the next few weeks, hepatosplenomegaly progresses, the boy fails to thrive, and he continues to reject food. Chest X-ray shows a reticulonodular pattern and calcified nodules. Biopsy of the liver shows foamy histiocytes. A Niemann-Pick disease is suspected. Which of the following is the most likely deficient enzyme in this patient?

- A. Sphingomyelinase
- B. Glucose-6-phosphatase
- C. Galactocerebrosidase
- D. Glucocerebrosidase
- E. Phenylalanine-hydroxylase

32. The patient's ECG shows that in the second standard lead from the extremities the P waves are positive, their amplitude is 0.1 mV (the norm is 0.05-0.25 mV), duration - 0.1 seconds (the norm is 0.07-0.10 seconds). It can be concluded that the following process occurs normally in the cardiac atria:

- A. Depolarization
- B. Repolarization
- C. Activation
- D. Contraction
- E. Relaxation

33. An oncology patient is to undergo a surgery on the descending colon. Name the main source of blood supply to this organ:

- A. Inferior mesenteric artery
- B. Superior mesenteric artery
- C. Celiac trunk
- D. Middle colic artery
- E. Splenic artery

34. A specimen of a parenchymal organ shows poorly delineated hexagonal lobules surrounding a central vein, and the interlobular connective tissue contains embedded triads (an artery, a vein and an excretory duct). What organ is it?

- A. Liver
- B. Pancreas
- C. Thymus
- D. Spleen
- E. Thyroid

35. At the post-mortem examination the stomach of a patient with renal failure was found to have a yellow-brown coating on the thickened mucosa. The coating was firmly adhering to its surface and had significant thickness. Microscopy revealed congestion and necrosis of mucosal and submucosal layers, fibrin presence. What is the most likely diagnosis?

- A. Fibrinous gastritis
- B. Croupous gastritis
- C. Gastric abscess
- D. Esogastritis
- E. Corrosive gastritis

36. Infectious diseases are treated with antibiotics (streptomycin, erythromycin, chloramphenicol). They inhibit the following stage of protein synthesis:

- A. Translation
- B. Transcription
- C. Replication
- D. Processing
- E. Splicing

37. A person with vitamin A deficiency develops twilight vision disturbance. Name the cells that fulfill this photoreceptor function:

- A. Rod cells
- B. Horizontal cells of retina
- C. Bipolar neurons
- D. Cone cells
- E. Ganglionic nerve cells

38. A 26-year-old female patient with bronchitis has been administered a broad spectrum antibiotic as a causal treatment drug. Specify this drug:

- A. Amoxicillin
- B. Interferon
- C. Isoniazid
- D. Vancomycin
- E. Dexamethasone

39. A 37-year-old man is admitted to hospital with mental confusion and disorientation. His wife reports he became more irritable and forgetful in the past year. In addition, she notes that he became a vegan a year ago, and currently, his diet consists of starchy foods like potatoes, corn, and leafy vegetables. GI symptoms include anorexia, diarrhea and vomiting. He has glossitis and skin lesions that appear as vesicles over the extremities. Eczema-like lesions around the mouth, as well as desquamation and roughened skin over the hands are also present. Neurologic examination reveals symmetrical hypesthesia for all types of sensation in both upper and lower extremities in a «gloves and socks» distribution. Deficiency in diet of which of the

following amino acids is the most likely cause of this condition?

- A. Tryptophan
- B. Threonine
- C. Arginine
- D. Histidine
- E. Lysine

40. In course of an experiment there has been an increase in the nerve conduction velocity. This may be caused by an increase in the concentration of the following ions that are present in the solution around the cell:

- A. Na^+
- B. K^+ and Cl^-
- C. K^+ and Na^+
- D. Ca^{2+} and Cl^-
- E. Ca^{2+}

41. When ascending to the top of Elbrus, a mountain climber experiences oxygen starvation, dyspnea, palpitations, and numbness of the extremities. What kind of hypoxia has developed in the mountain climber?

- A. Hypoxic
- B. Circulatory
- C. Hemic
- D. Tissue
- E. Cardiac

42. A 2-year-old boy is diagnosed with Down syndrome. What chromosomal changes may be the cause of this disease?

- A. Trisomy 21
- B. Trisomy 13
- C. Trisomy X
- D. Trisomy 18
- E. Monosomy X

43. A 37-year old female presents to the clinic complaining of severe pain in her left wrist and tingling sensation in her left thumb, index finger, and middle finger, and some part of her ring finger. The pain started as an occasional throb and she could ignore it or take ibuprofen but now the pain is much worse and wakes her up at night. She works as a typist and her pain mostly increases after typing all day. Her right wrist and fingers are fine. Nerve conduction studies reveal nerve compression. Which of the following

nerves is most likely compressed in this patient?

- A. Median nerve
- B. Ulnar nerve
- C. Radial nerve
- D. Axillary nerve
- E. Musculocutaneous nerve

44. In the body of a 37-year-old woman, who died with signs of pulmonary edema, there was detected an acute deformation of the aortic valve: it is shortened, thickened, ulcerated, has areas of stone-like density. On its external surface there are large, up to 2 cm in diameter, thrombotic plaques. The left ventricle wall is 2.2 cm thick. The cardiac muscle is dull, matt, and flaccid. What type of endocarditis corresponds with the described changes in the aortic valve?

- A. Ulcerative polypoid endocarditis
- B. Diffuse endocarditis
- C. Acute verrucous endocarditis
- D. Recurrent verrucous endocarditis
- E. Fibroplastic endocarditis

45. The parents with normal hearing have two daughters and a son, who are congenitally deaf. Their other 5 children are healthy. What is the pattern of deafness inheritance in this case?

- A. Autosomal recessive
- B. Autosomal dominant
- C. X-linked recessive
- D. X-linked dominant
- E. Y-linked

46. After the prolonged vomiting a pregnant 26-year-old woman was found to have the reduced volume of circulating blood. What change in the total blood volume can be present?

- A. Polycythemic hypovolemia
- B. Simple hypovolemia
- C. Oligocythemic hypovolemia
- D. Polycythemic hypervolemia
- E. Oligocythemic hypervolemia

47. One of the causes of chronic pancreatitis is the autolysis of pancreatic parenchyma due to intraorganic conversion of trypsinogen into trypsin. How does this process occur in the duodenum under normal conditions?

- A. Limited proteolysis
- B. Allosteric regulation
- C. Phosphorilation
- D. Acetylation
- E. ADP-ribosylation

48. A 34-year-old man visits his dentist complaining of toothache. After a dental procedure that involved extraction of several teeth, he develops severe bleeding lasting more than 15 minutes. He has a history of chronic hepatitis C. Which of the following is the most likely cause of prolonged bleeding in this patient?

- A. Hypofibrinogenemia
- B. Thrombocytopenia
- C. Hypocalcemia
- D. Hypoalbuminemia
- E. —

49. An 18-year-old girl comes to her physician with concern about her health because she has not achieved menarche. She denies any significant weight loss, changes in mood, or changes in her appetite. She mentions that her mother told her about mild birth defects, but she cannot recall the specifics. Past medical history and family history are benign. On physical examination, the patient is short in stature, has a short and webbed neck and wide chest. Staining of buccal smear reveals absence of Barr bodies in the nucleus of epithelial cells. A urine pregnancy test is negative. Which of the following genetic disorders is the most likely cause of this patient's condition?

- A. Turner syndrome
- B. Cri du chat («cat-cry») syndrome
- C. Klinefelter syndrome
- D. Patau syndrome
- E. Edwards syndrome

50. A microslide demonstrates an organ with its wall consisting of three layers. The inner layer has tubular glands and undergoes cyclic changes. Name this organ:

- A. Uterus
- B. Esophagus
- C. Vagina
- D. Ureter
- E. Urinary bladder