

## Clinical Medicine and Public Health: second-round sample tasks

The variant includes 40 tasks, of which 25 are entry-level tasks with one correct answer (a correctly completed task is estimated at 1 point), 10 intermediate-level tasks with several correct answers (a correctly completed task is estimated at 3 points), 5 complex tasks with a detailed answer (the correctly completed task is estimated at 9 points)

In test tasks, the correct answers are given in bold.

*Choose the correct answer:*

1. There are sutures between
  - A. **Bones of the skull**
  - B. Pelvic bones
  - C. Carpal bones and tarsal bones
  - D. Vertebrae
2. What property of nervous and muscular tissue cannot be investigated in an experiment using single stimuli?
  - A. Excitability
  - B. **Lability**
  - C. Contractility
  - D. Conductivity
3. In the framework of the inflammatory response, serotonin causes
  - A. **Increased vascular permeability**
  - B. Adhesion of leukocytes
  - C. Fibrin prolapse
  - D. Damage to the vessel
4. Pancytopenia is typical for
  - A. **Aplastic anemia**
  - B. Hemolytic anemia
  - C. Iron-deficiency anemia
  - D. Blood loss anemia
5. Selective stimulation of  $\mu$ -opioid receptors is typical for
  - A. **Fentanyl**
  - B. Trimepiridine
  - C. Tramadol
  - D. Lidocaine
6. Choose the most suitable lipid-lowering drug for a patient with elevated LDL levels:
  - A. **HMG-CoA reductase inhibitors**
  - B. Fibroic acid derivatives
  - C. Cholestyramine
  - D. Nicotinic acid

7. A patient is 64 years old. He has had type 2 diabetes for 10 years (without any damage to the target organs), arterial hypertension (maximum increase of blood pressure up to 180/100 mm hg). Which category of cardiovascular risk does this patient belong to?
- A. **High risk**
  - B. Very high risk
  - C. Moderate risk
  - D. Low risk
8. Chronic hepatitis C is characterized by
- A. Dominance of ALT over AST
  - B. **Dominance of AST over ALT**
  - C. Isolated increase in ALT
  - D. Isolated increase in AST
9. Pancreatitis is characterized by:
- A. **Increase in amylase levels**
  - B. High total cholesterol
  - C. Reduction of amylase levels
  - D. Increase in total protein
10. Extraintestinal manifestations of Crohn's disease are
- A. **Erythema nodosum**
  - B. Interintestinal fistulas
  - C. Pancreatogenic diabetes mellitus
  - D. Generalized erosive psoriasis
11. The stomach is supplied by all arteries except
- A. A. gastrica sinistra
  - B. A. gastroepiploica dextra
  - C. A. lienalis
  - D. **A. hepatica propria**
12. Hernias of the anterior abdominal wall include all but
- A. Hernia of the Spigelian line
  - B. **Morgagni hernia**
  - C. Postoperative hernia
  - D. Umbilical hernia
13. For antibiotic prophylaxis in surgical procedures we do not use
- A. Cefazolin
  - B. Clindamycin
  - C. **Cefoperazone**
  - D. Vancomycin
14. The Courvoisier syndrome results from
- A. **Cancer of the pancreatic head**
  - B. Choledocholithiasis
  - C. Gallbladder cancer

- D. Calculous cholecystitis
15. Lichtenstein repair is performed for
- A. Femoral hernia
  - B. Inguinal hernia**
  - C. Postoperative hernia
  - D. Spigelian hernia
16. Lifestyle as a determinant of health is responsible for
- A. 50-55% of health problems**
  - B. 18-20 % of health problems
  - C. 5-10 % of health problems
  - D. 20-25 % of health problems
17. The method of studying the morbidity of population by analysing causes of death has the following advantage
- A. It is the general source of information about diseases with lethal outcome**
  - B. It is the basic source of information about acute diseases
  - C. It permits to find early or latent symptoms of a disease
  - D. It is cheaper than the others
18. The process of people leaving one country to reside in another is called
- A. Emigration**
  - B. Immigration
  - C. Seasonal migration
  - D. Urbanization
19. Difficulties in activities (for example, eating) are called
- A. Activity limitations**
  - B. Impairments
  - C. Social handicap
  - D. Injuries
20. Which value is considered as average:
- A. Mean**
  - B. Quantile
  - C. Significance
  - D. Probability
21. Monitoring, treatment and rehabilitation of patients with chronic diseases are components of
- A. Tertiary prevention**
  - B. Primary prevention
  - C. Quaternary prevention
  - D. Secondary prevention
22. Changes in the number of healthy individuals in a population are a criterion of
- A. Primary prevention**
  - B. Secondary prevention

- C. Tertiary prevention
  - D. Quaternary prevention
23. Which factor belongs to primary risk factors
- A. Smoking**
  - B. Atherosclerosis
  - C. Diabetes
  - D. Rheumatoid arthritis
24. Population-wide strategy is aimed at
- A. Preventive and health improvement measures at industrial enterprises
  - B. Identifying specific risks for the development and progression of diseases for each patient
  - C. Identifying adverse lifestyle and environmental factors that increase the risk of diseases among the population**
  - D. Immunization of children
25. Relative risk is
- A. Ratio of the prevalence of a particular disease among people exposed to a risk factor to the prevalence of a disease among those not exposed**
  - B. Difference between the risk in the exposed group and the unexposed group
  - C. Ratio of the number of healthy people to those ill in the population
  - D. Ratio of the number of people exposed to a risk factor to those not exposed

*Choose the correct answers:*

26. The central organs of the immune system are
- A. **Thymus**
  - B. Spleen
  - C. Red bone marrow**
  - D. Tonsils
27. The autonomic nervous system regulates
- A. visceral organ function**
  - B. the vascular tone**
  - C. trophic innervation of tissues**
  - D. the skeletal muscle tone
28. Iron-deficiency anemia is characterized by
- A. Ferritin reduction**
  - B. Increase in the total iron binding capacity (TIBC)**
  - C. Acute onset
  - D. Decrease of total iron binding capacity (TIBC)
29. The indication for parenteral administration of iron preparations is
- A. Maldigestion syndrome**
  - B. Resection of the small intestine**
  - C. Resection of the colon
  - D. Recurrent pregnancy

30. Pain in the upper right quadrant (URQ) of the abdomen can be caused by
- Biliary colic**
  - Duodenal ulcer**
  - Ectopic pregnancy
  - Portal vein thrombosis**
31. Systemic complications of acute pancreatitis includes
- ARDS**
  - Paralytic ileus**
  - Hypercalcemia
  - Left-sided or bilateral pleural effusion**
32. Dynamic as a part of demography studies
- Immigration**
  - Mortality**
  - Hospitalization
  - Morbidity
33. The correlation coefficient of - 0.15 represents
- Strong relationship
  - Weak relationship**
  - Negative (reverse) relationship**
  - Positive (direct) relationship
34. Components of primary prevention are
- Counseling and promoting a healthy lifestyle**
  - Social-hygienic monitoring**
  - measures for the rehabilitation of patients with chronic diseases
  - medical checkups of people with a high risk of disease
35. What levels of relative risk show that the factor studied decreases the risk of disease?
- RR=3
  - RR=1
  - RR=0,5**
  - RR=0,1**
36. Patient V. has been prescribed Carvedilol for the treatment of arterial hypertension. The patient suffered from bronchospasm.

**Questions (the number of points for the correct answer is given in brackets):**

- Specify the mechanism of the action of the drug (3 points)
- What are the most common side effects of Carvedilol? (3 points)
- What cardioselective  $\beta$ -blockers do you know? (3 points)

**Answers:**

- Nonselective blockade of  $\alpha$ ,  $\beta$  - adrenergic receptors
- Common side effects include dizziness, tiredness, joint pain, low blood pressure, nausea, shortness of breath, bronchospasm, bradycardia

### 3. Metoprolol, bisoprolol, atenolol, betaxolol, nebivolol

37. A 20-year-old patient complained about weakness, decreased physical and mental performance, unpleasant sensations in muscles, episodic pain in small and large joints while moving.

Anamnesis of the disease: the patient said she had been ill for 2 weeks. The first symptoms appeared after stress at work and have been increasing since then. She took multivitamins to relieve the symptoms, but without any positive effect. So, she sought medical help.

Life history: single, lives in an apartment, works in an office, her working day is "irregular", describes her work as "nervous". Does not smoke, does not drink alcohol and denies substance abuse. Periodically takes multivitamins. 2 months ago, she underwent a medical examination, which included examination by a general practitioner, a gynecologist, a neurologist, an otorhinolaryngologist, had fluorography, general blood and urine tests, and biochemical blood tests. No pathology was detected. The patient is physically active and exercises regularly. No history of hereditary diseases. No history of chronic illnesses. No epidemiological history of diseases. She has been vaccinated according to the vaccination plan for the patient's age.

Examination: the condition is relatively satisfactory. Asthenic physique. Height is 178 cm, weight is 62 kg. The skin is of a normal physiological color. Mucous membranes are of a normal color. The joints are normal. Respiratory and blood circulatory systems are without pathology. The abdomen is of a normal size, soft on palpation, and painless in all parts. The liver and spleen are not enlarged. There is no dysuria.

Laboratory examination:

The general blood test showed an increase in ESR up to 30 mm / h;

HBsAg, HCVAb, HIV 1 and 2 antibodies and HIV 1 and 2 antigen (HIV Ag/AbCombo) – negative.

In the biochemical blood test: ALT – 20 upper limit of the norm (ULN); AST-15 ULN; total and direct bilirubin levels are normal; ALP-1.5 ULN; GGT - 2 ULN; INR-1.30 (norm 0.8-1.2); total protein-88 g / l (the norm up to 83), albumin-30 g/l (norm 35-52), the levels of alpha 1 and 2, beta globulins are normal; the level of gamma globulin is 22 g/l (ULN is 15.2); M-gradient is not detected on electrophoresis, when studying the level of immunoglobulins, a slight increase in IgA, IgM levels and an increase in IgG levels up to 2 ULN were noted.

**Questions (the number of points for the correct answer is given in brackets):**

1. Assume the most probable diagnosis. Explain your diagnosis (3 points)
2. Make a plan of an additional examination of the patient. Explain your reasoning (3 points).
3. What therapy would you prescribe to this patient (regime, diet, medication) (3 points).

**Answers:**

1. Autoimmune hepatitis of a high degree of activity.

The diagnosis of hepatitis is based on the revealed cytolysis syndrome: a sharp increase in ALT and AST levels over ULN in combination with a moderate increase in ALP and GGT.

The absence of markers of hepatotropic infections in the blood, a history of alcohol abuse, hepatotoxic drugs, the absence of a family history of liver diseases in combination with severe hypergammaglobulinemia and polyclonal gammopathy with a predominant increase in IgG levels in the absence of physical and laboratory signs of cirrhosis of the liver indicate an autoimmune nature of hepatitis.

A 10-fold increase in ALT and AST compared to the norm makes it possible to classify hepatitis as acute.

2. Taking into account the previous examinations, it is necessary to perform an ultrasound of the abdominal organs to exclude focal pathology of the liver, diseases of the bile ducts and gallbladder, portal hypertension and lymphadenopathy of the abdominal cavity. The patient has a clinical and biochemical picture of acute hepatitis. To completely exclude the viral nature of hepatitis, the performed tests are not enough. To exclude acute hepatitis C, the presence of HCV RNA in the blood should be determined; to exclude acute hepatitis A and E - antiHAV IgM, antiHEV IgM; to exclude infectious mononucleosis - EBV DNA, antibodies to the early EBV antigen. There is no need to exclude acute hepatitis B, since the patient has been vaccinated against HBV. The level of immunity should be assessed by a quantitative anti-HBs test. To confirm the diagnosis of autoimmune hepatitis, it is necessary to determine a-nuclear antibodies (ANA), smooth muscle antibodies (SMA), and antibodies to liver and kidney microsomes type 1 (anti-LKM-1), liver nocturnal cytosolic protein (anti-LC-1), soluble hepatic antigen (anti-SLA) and hepatic-pancreatic antigen (anti-LP). It is also necessary to conduct screening for Wilson's disease –serum ceruloplasmin, hemochromatosis-ferritin.

3. No special health regime is required. The diet should be rich in protein (a high-protein diet) Recommended medications include glucocorticosteroids (prednisolone, methylprednisolone, budesonide) and immunosuppressants (azathioprine, 6-mercaptopurine, cyclophosphamide)

38. A 70-year-old woman complains of swelling in the right groin, which appeared about 2 months ago, and episodic pain in this area. The patient had Covid 3 months ago, developed pneumonia, and had lung damage of over 25%. She was treated in hospital for over 2 weeks. Currently, she complains about weakness and cough, which has become rarer, but has not disappeared completely. Due to hypertension, she takes combined hypotensive therapy, which includes lisinopril and bisoprolol. She is 164 cm tall and weighs 82 kg; BMI 30.49 kg/m<sup>2</sup>. During the examination, the abdomen was soft and painless, with no peritoneal symptoms. Femoral arteries pulsated normally. There was a soft, elastic, painless and nontender groin mass on the right side below the inguinal ligament, the skin above it was unchanged. The mass increases in size when the patient is standing and coughing.

**Questions (the number of points for the correct answer is given in brackets):**

1. What is the most likely diagnosis? Explain (3 points).
2. What risk factors does the patient have? (3 points)
3. What is the treatment? (3 points)

**Answers:**

1. Gender (female), age (70), location of the groin mass below the inguinal ligament, and the "coughing" symptom showed that the patient had a femoral hernia.
2. The risk factors of femoral hernia development are old age and female gender. These factors result in the enlargement of the femoral ring and anatomic features of the pelvis in women having a wider vascular lacuna. Risk factors for hernia development also include obesity (BMI 30.49 kg/m<sup>2</sup>), chronic cough because of the new coronavirus infection, and taking hypotensive drugs (lisinopril as an ACE inhibitor, bisoprolol as a  $\beta$ -blocker), which can also cause cough and lead to increased intra-abdominal pressure.
3. All patients with femoral hernias should be operated; non-tensioned hernioplasty (using a mesh prosthesis) should be performed due to a high risk of complications (incarceration, Richter's incarceration, strangulation, acute intestinal obstruction, peritonitis). Femoral hernias account for only 5% of all anterior abdominal wall hernias, and 40% of incarcerated and complicated hernias.

39. The aim of the study was to evaluate the self-assessed quality of life and its social factors in citizens of city K. to develop social programs for health protection.

**Questions (the number of points for the correct answer is given in brackets):**

1. Determine the objectives of research (3 points).
2. Make a brief plan and program for statistical research (object of study, place of research, type of research by time, type of research by volume, subject of observation, registration characteristics according to a classification) (6 points).

**Answers:**

1. Research objectives:
  - 1) To study the social environment in city K.
  - 2) To analyze the self-assessment of the quality of life by city K. citizens.
  - 3) To develop social programs for health protection.
2. Elements of plan and program:
  - 1) Object of study: adult citizens of city K.
  - 2) Place of research: city K.
  - 3) Type of research by time: one-time (occasional).
  - 4) Type of research by volume: selective.
  - 5) Subject of observation: adult citizen of city K.
  - 6) Registration characteristics: gender (nominal), age (continuous), living conditions (nominal), social class (ordinal), self-assessed quality of life (continuous)

40. For his thesis research, an oncologist conducted a study of risk factors for oncological diseases. He assessed some risk factors for bronchial and lung cancer in men: smoking (RR=5.6), family history (RR=2.6), weaknesses in the organization of medical care (RR=1.2), air pollution (RR=4.5).

**Questions (the number of points for the correct answer is given in brackets):**

1. What parameter was used to assess the risk factors? (3 points)
2. Analyze the values of this parameter (3 points).
3. Suggest smoking prevention measures (3 points).

**Answers:**

1. Relative risk
2. Smoking increases the risk of developing bronchial and lung cancer in men by 5.6 times, family history – by 2.6 times, weaknesses in the organization of medical care – by 1.2 times, air pollution – by 4.5 times.
3. Smoking prevention measures may include promoting smoking cessation, hygiene education, banning smoking in public places, raising the price of cigarettes, and banning tobacco advertising.