МИНИСТЕРСТВО ЗДРАВООХРАНЕНИЯ РЕСПУБЛИКИ БЕЛАРУСЬ

УЧРЕЖДЕНИЕ ОБРАЗОВАНИЯ
«ГОМЕЛЬСКИЙ ГОСУДАРСТВЕННЫЙ МЕДИЦИНСКИЙ УНИВЕРСИТЕТ»

Кафедра патологической физиологии

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ТЕСТОВЫЕ ЗАДАНИЯ ПО ПАТОЛОГИЧЕСКОЙ ФИЗИОЛОГИИ

Учебно-методическое пособие
для студентов 3 курса факультета по подготовке специалистов
для зарубежных стран, обучающихся на английском языке
по специальности «Лечебное дело», медицинских вузов

В трех частях

Часть 2
Патофизиология крови

TEST TASKS ON PATHOLOGICAL PHYSIOLOGY

Teaching workbook
for 3rd year students of the faculty for training specialists
for foreign countries, studying in English on specialty «General medicine»
of higher medical education institutions

In three parts

Part 2
Pathophysiology of blood

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Учебно-методическое пособие содержит тестовые задания, составленные в соответствии с типовой учебной программой для вузов по специальности «Лечебное дело». Решение этих заданий позволит углубить и закрепить знания студентов при изучении патологической физиологии.

Предназначено для работы студентов 3 курса факультета по подготовке специалистов для зарубежных стран, обучающихся на английском языке по специальности «Лечебное дело», медицинских вузов. Может быть использовано для самостоятельной работы и самоконтроля знаний.

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LIST OF ABBREVIATION

CBV	— circulating blood volume
DIC	— disseminated intravascular coagulation
DNA	— deoxyribonucleic acid
ESR	— erythrocyte sedimentation rate
G-6-PD	— glucose-6-phosphate dehydrogenase
GP	— glycoprotein
Ig	— immunoglobulin
Pg	— prostaglandin
RBC	— red blood cell
WBC	— white blood cell

MULTIPLE CHOICE TESTS

PATHOPHYSIOLOGY OF BLOOD. CHANGES IN TOTAL BLOOD VOLUME. BLOOD LOSS

Indicate all correct answers

1. Increased hematocrit can be considered as:
Variants of answer:
a) 0,7 l/l;
b) 0,55 l/l;
c) 0,45 l/l;
d) 0,35 l/l.

2. Increased hematocrit index is observed at:
Variants of answer:
a) a combined mitral heart disease;
b) 4–5 days after acute blood loss;
c) burn shock;
d) erythremia (polycythaemia vera).

3. Increased blood viscosity is observed at:
Variants of answer:
a) relative erythrocytosis;
b) absolute erythrocytosis;
c) erythremia (polycythaemia vera);
d) pernicious anemia Addison-Biermer;
e) sideroblastic anemia.

4. Decreased hematocrit index is observed at:
Variants of answer:
a) burn shock;
b) in first hour after massive blood loss;
c) 4–5 days after acute blood loss;
d) pernicious vomiting.

5. Polycythemic hypovolemia is observed at:
Variants of answer:
a) extensive burns;
b) overheating;
c) heart failure;
d) erythremia (polycythaemia vera).

6. Simple hypovolemia is observed at:
Variants of answer:
a) 30–40 min after acute blood loss;
b) 6–8 hours after acute blood loss;
c) burn shock;
d) overheating.

7. Oligocythemic normovolemia is observed at:
Variants of answer:
a) chronic heart failure;
b) acute hemolytic anemia;
c) 4–5 hours after acute blood loss;
d) chronic post-hemorrhagic anemia.

8. Polycythemic normovolemia is observed at:
Variants of answer:
a) chronic hypoxia;
b) chronic post-hemorrhagic anemia;
c) burn shock;
d) acute hemolytic anemia;
e) overheating.

9. Specify changes in indices of function of cardiovascular system at hypovolemia:
Variants of answer:
a) increase in blood pressure;
b) decrease in blood pressure;
c) decrease in minute blood ejection;
d) increase in minute blood ejection;
e) increase in volumetric blood flow velocity;
f) decrease in volumetric blood flow velocity.

10. Normocythemic hypervolemia is observed at:
Variants of answer:
a) large amount of blood transfusion;
b) kidney disease;
c) erythremia;
d) intravenous injection of blood substitutes;
e) shock.

11. Oligocythemic hypervolemia is observed at:
Variants of answer:
a) heart defects;

b) in patients with kidney disease;
c) erythremia;
d) intravenous injection of physiological solution;
e) intravenous injection of blood substitutes;
f) shock.

12. Polycythemic hypervolemia is observed at:
Variants of answer:
a) erythremia (polycythaemia vera);
b) combined mitral heart disease;
c) pulmonary emphysema;
d) kidney disease;
e) intravenous injection of blood substitutes;
f) shock.

13. Specify processes that have adaptive value for an organism immediate after acute blood loss:
Variants of answer:
a) decrease in venous return;
b) peripheral vasoconstriction;
c) centralization of blood circulation;
d) tissue hypoperfusion;
e) oliguria;
f) hyperventilation.

14. Specify etiological factors for blood loss:
Variants of answer:
a) injury of blood vessels;
b) increased permeability of vascular wall;
c) inhibition of blood clotting (haemorrhagic syndrome);
d) sclerosis of vascular wall;
e) thrombocytosis.

15. During first minutes after acute blood loss of moderate severity is observed:
Variants of answer:
a) oligocythemic normovolemia;
b) normocythemic hypovolemia;
c) oligocythemic hypovolemia;
d) polycythemic hypovolemia.

16. Specify changes of hematological parameters typical for state after acute blood loss of moderate severity in 20–30 minutes:

Variants of answer:

a) decrease in hemoglobin in blood unit;
b) normal hemoglobin in blood unit;
c) decrease in RBCs in blood unit;
d) normal hematocrit value;
e) decrease in content of iron in blood unit.

17. Specify the main link in pathogenesis of first stage of acute post-hemorrhagic anemia:

Variants of answer:

a) vessel damage;
b) decrease in circulating blood volume;
c) hemic type of hypoxia;
d) iron deficiency;
e) decrease in RBCs in blood.

18. Vascular reflex phase of compensatory stage after acute blood loss is characterized by:

Variants of answer:

a) spasm of peripheral vessels due to release of catecholamines;
b) erythropoiesis;
c) dilation of peripheral vessels;
d) activation of the renin-angiotensin-aldosterone system;
e) release of atrial natriuretic peptide.

19. Specify the earliest terms of restoration of circulating blood volume after acute blood loss of moderate severity:

Variants of answer:

a) after 7–8 hours;
b) after 24–48 hours;
c) after 4–5 days.

20. At the end of 1–2 days after acute blood loss of moderate severity is observed:

Variants of answer:

a) polycythemic hypovolemia;
b) normocythemic hypovolemia;
c) oligocythemic normovolemia;
d) oligocythemic hypovolemia;
e) oligocythemic hypervolemia.

21. Specify changes of hematological parameters typical for state after acute blood loss of moderate severity in 24–48 hours:

Variants of answer:

a) restoration of hematocrit to normal;

b) decrease in hematocrit index;

c) normal color index;

d) decrease in color index;

e) increase in reticulocytes in blood;

f) normal hemoglobin in blood unit.

22. Specify a terms of restoration of circulating blood volume (with loss up to 1 liter) by entering of interstitial fluid into a blood vessels:

Variants of answer:

a) within 1–2 days;

b) within 2–3 days;

c) within 1–2 hours;

d) after 4–5 days;

e) after 40 days.

23. Specify changes in blood volume that occur within 2–3 hours after acute blood loss of moderate severity:

Variants of answer:

a) oligocythemic hypovolemia;

b) simple hypovolemia;

c) oligocythemic normovolemia;

d) simple normovolemia.

24. Specify changes in blood volume that occur after 4–5 days after acute blood loss of moderate severity:

Variants of answer:

a) oligocythemic hypovolemia;

b) simple hypovolemia;

c) oligocythemic normovolemia;

d) simple normovolemia.

25. Specify in what terms after acute blood loss of moderate severity develops reticulocytosis:

Variants of answer:

a) after 2–3 days;

b) after 4–5 days;

c) after 24–48 hours;

d) immediately after blood loss.

26. Specify changes in hematological parameters that occur after 6–8 days after acute blood loss of moderate severity:

Variants of answer:

a) increase in reticulocytes in blood;
b) neutrophilic leukocytosis with nuclear shift to the left;
c) increase in latent iron binding capacity;
d) thrombocytopenia;
e) normochromic anemia.

27. Specify a terms of restoration of circulating blood volume (with loss up to 1 liter) due to activation of erythropoiesis:

Variants of answer:

a) within 1–2 days;
b) within 2–3 days;
c) within 1–2 hours;
d) after 4–5 days;
e) after 40 days.

28. Activation of proteosynthesis in a liver after acute blood loss of moderate severity start after:

Variants of answer:

a) few hours;
b) few days;
c) few weeks;
d) immediately.

29. Terminal stage of acute posthemorrhagic anemia may occur in acute massive blood loss exceeding:

Variants of answer:

a) 50 % of CBV;
b) 15 % of CBV;
c) 20 % of CBV;
d) 30 % of CBV.

30. Chronic post-hemorrhagic anemia is characterized by:

Variants of answer:

a) hypochromia of erythrocytes;
b) anisocytosis and poikilocytosis of erythrocytes;
c) reticulocytosis (15–20 %);
d) normal or slightly increased content of reticulocytes;
e) decrease in leuco-erythroblastic relations in bone marrow;
f) increase in coefficient of transferrin saturation.

PATHOPHYSIOLOGY OF BLOOD. PATHOPHYSIOLOGY OF ERYTHROCYTES. DYSERYTHROPOIETIC ANEMIAS

Indicate all correct answers

1. Erythrocyte sedimentation rate is increased at:
Variants of answer:
a) acute inflammation;
b) nephrotic syndrome;
c) erythrocytes;
d) acidosis;
e) anemias.

2. Indicate in which type of anemias the erythrocyte sedimentation rate is decreased:
Variants of answer:
a) anemia Addison-Biermer;
b) iron deficiency anemia;
c) sickle cell anemia;
d) aplastic anemia.

3. Indicate the main pathogenetic factors causing the development of anemia:
Variants of answer:
a) insufficient production of erythrocytes;
b) increased destruction of erythrocytes;
c) increased production of erythrocytes;
d) insufficient destruction of erythrocytes;
e) violation of output of erythrocytes from bone marrow.

4. Dyserythropoietic anemias are:
Variants of answer:
a) anemia Addison-Biermer;
b) hereditary spherocytosis (Minkovsky-Shoffar's anemia);
c) acute posthemorrhagic anemia;
d) chronic posthemorrhagic anemia;
e) aplastic anemia.

5. Specify anemias that characterized by shift of Price-Jones curve to the left:
Variants of answer:
a) anemia Addison-Biermer;
b) iron deficiency anemia;

c) hereditary sideroblastic anemia;
d) chronic posthemorrhagic anemia;
e) acute posthemorrhagic anemia.

6. Microcytosis of erythrocytes is characteristic for:
Variants of answer:
a) acute posthemorrhagic anemia;
b) chronic posthemorrhagic anemia;
c) aplastic anemia;
d) iron deficiency anemia.

7. Specify anemias that characterized by shift of Price-Jones curve to the right:
Variants of answer:
a) anemia Addison-Biermer;
b) iron deficiency anemia;
c) chronic posthemorrhagic anemia;
d) anemia in diphyllobothriasis;
e) acute posthemorrhagic anemia.

8. Regenerative (hyperregenerative) anemias include:
Variants of answer:
a) iron deficiency anemia;
b) acute posthemorrhagic anemia;
c) Minkovsky-Shoffar's hemolytic anemia;
d) autoimmune hemolytic anemia;
e) folic acid deficiency anemia.

9. Hyporegenerative anemias include:
Variants of answer:
a) chronic posthemorrhagic anemia;
b) acute posthemorrhagic anemia;
c) anemia at diphyllobothriasis;
d) hereditary sideroblastic anemia;
e) hereditary spherocytosis (Minkovsky-Shoffar's anemia).

10. Increase in osmotic resistance of erythrocytes is observed at:
Variants of answer:
a) in hypercholesterolemia;
b) chronic post-hemorrhagic anemia;
c) pernicious anemia Addison-Biermer;
d) after massive blood loss.

11. Indicate which of anemias are normochromic:

Variants of answer:

a) acute posthemorrhagic anemia;
b) aplastic anemia;
c) autoimmune hemolytic anemia;
d) chronic posthemorrhagic anemia.

12. Hypochromia of erythrocytes is detected at:

Variants of answer:

a) thalassemia;
b) iron deficiency anemia;
c) hereditary sideroblastic anemia;
d) B_{12} deficiency anemia;
e) acute posthemorrhagic anemia;
f) anemia at diphyllobothriasis.

13. Increased color index is detected at:

Variants of answer:

a) iron deficiency anemia;
b) pernicious anemia Addison-Biermer;
c) diphyllobothriasis;
d) folic acid deficiency anemia;
e) aplastic anemia.

14. Megaloblastic type of hemopoiesis is observed at:

Variants of answer:

a) α-thalassemia;
b) anemia in resection of jejunum;
c) aplastic anemia;
d) hereditary hemolytic anemias;
e) anemia Addison-Biermer;
f) folic acid deficiency anemia.

15. Specify reasons that lead to development of iron deficiency anemia most often:

Variants of answer:

a) chronic blood loss;
b) acute massive blood loss;
c) ionizing radiation;
d) prolonged enteritis;
e) achlorhydric state;
f) parasitizing broad tapeworm.

16. Violation of iron absorption takes place at:

Variants of answer:

a) intestinal disease, accompanied by a decrease in a sorption properties of enterocytes;

b) deficiency of proteins, amino acids;

c) invasion of broad tapeworm;

d) hereditary atransferrinemia.

17. Specify parameters of iron metabolism that are typical for iron deficiency anemia:

Variants of answer:

a) decrease in sideroblasts in bone marrow;

b) increase in sideroblasts in bone marrow;

c) decrease in coefficient of transferrin saturation;

d) decrease in latent iron binding capacity;

e) increase in total iron binding capacity.

18. Specify hematological parameters typical for iron deficiency anemia:

Variants of answer:

a) colour index < 0.7;

b) colour index > 1.2;

c) reticulocytes 1 %;

d) anisocytosis with a predominance of microcytes;

e) anisocytosis with a predominance of macrocytes;

f) Jolly bodies in erythrocytes.

19. Specify reasons leading to the development of sideroblastic anemia:

Variants of answer:

a) hereditary defect in formation of hemesynthetase;

b) formation of anti-erythrocytic antibodies;

c) hereditary defect in synthesis uroporphyrindecarboxylase;

d) chronic intoxication by lead salts;

e) G-6-PD deficiency in erythrocytes;

f) pyridoxal phosphate deficiency.

20. Specify hematological parameters typical for sideroblastic anemia:

Variants of answer:

a) decrease in serum iron;

b) hypochromia of erythrocytes;

c) megaloblastic type of hemopoiesis;

d) reticulocytosis (15–20 %);

e) anisocytosis and poikilocytosis of erythrocytes;

f) shift of Price-Jones curve to the right.

21. The causes of B_{12}-deficiency anemia can be:

Variants of answer:

a) acute massive blood loss;
b) repeated blood loss;
c) resection of a stomach;
d) chronic microbial enteritis;
e) parasitizing broad tapeworm;
f) absence of Castle factor in gastric juice.

22. Specify factors that play a significant role in the pathogenesis of B_{12}-deficiency anemia:

Variants of answer:

a) insufficient hemoglobin content in erythrocytes;
b) violation of DNA synthesis in nuclei of erythroblasts;
c) shortening of erythrocytes lifetime.

23. B_{12} deficiency anemia is characterized by:

Variants of answer:

a) increase in serum iron;
b) hypochromia of erythrocytes;
c) megaloblastic type of hemopoiesis;
d) macrocytosis;
e) presence of RBCs with Jolly bodies and Cabot rings;
f) anisocytosis with a predominance of macrocytes.

24. Pernicious anemia Addison-Biermer is characterized by:

Variants of answer:

a) neutropenia varying degrees;
b) hyperchromia of erythrocytes;
c) leukopenia, thrombocytopenia;
d) atrophic glossitis;
e) symptoms of funicular myelosis;
f) increase in latent iron binding capacity.

25. A development of pernicious-like anemia can be caused by:

Variants of answer:

a) radiation sickness;
b) subtotal resection of a stomach;
c) resection of a ileum;
d) resection of a jejunum;
e) diphyllobothriasis.

26. Folic acid deficiency anemia is characterized by:
Variants of answer:
a) hyperchromia of erythrocytes;
b) leukopenia, thrombocytopenia;
c) atrophic glossitis;
d) symptoms of funicular myelosis;
e) increase in latent iron binding capacity;
f) high percentage of ineffective erythropoiesis.

27. Specify the causes of aplastic anemias:
Variants of answer:
a) resection of a stomach;
b) leukemias;
c) lack of vitamin B_{12} in food;
d) drug abuse;
e) ionizing radiation.

28. Aplastic anemia is characterized by:
Variants of answer:
a) relative lymphocytosis;
b) neutropenia;
c) neutrophilia;
d) decrease in latent iron binding capacity;
e) high percentage of ineffective erythropoiesis;
f) shortening of erythrocytes lifetime.

29. Specify hematological parameters typical for aplastic anemia:
Variants of answer:
a) anisocytosis and poikilocytosis of erythrocytes;
b) reticulocytosis;
c) absence of reticulocytes;
d) leukopenia, thrombocytopenia;
e) bone marrow hyperplasia;
f) bone marrow hypoplasia.

30. Metaplastic anemia is observed at:
Variants of answer:
a) vitamin B_{12} deficiency;
b) action on the organism of microbial poisons;
c) effects on ionizing radiation on the body;
d) metastases of malignant tumors in bone marrow;
e) chronic blood loss.

PATHOPHYSIOLOGY OF BLOOD. HEMOLYTIC ANEMIAS. ERYTHROCYTOSIS

Indicate all correct answers

1. Specify hematological parameters typical for hemolytic anemia:
Variants of answer:
a) anisocytosis and poikilocytosis of erythrocytes;
b) reticulocytosis;
c) absence of reticulocytes;
d) leukopenia, thrombocytopenia;
e) bone marrow hypoplasia.

2. Hemolytic anemia is characterized by:
Variants of answer:
a) oligocythemic hypovolemia;
b) oligocythemic hypervolemia;
c) polycythemic hypovolemia;
d) oligocythemic normovolemia;
e) polycythemic normovolemia.

3. Lifetime of RBCs in blood is sharply reduced at:
Variants of answer:
a) sickle cell anemia;
b) hereditary spherocytosis (Minkovsky-Shoffar's anemia);
c) thalassemia;
d) acute posthemorrhagic anemia;
e) erythrocytosis.

4. Intravascular hemolysis is typical for:
Variants of answer:
a) sickle cell anemia;
b) hereditary spherocytosis;
c) sepsis;
d) transfusion of incompatible blood group;
e) paroxysmal nocturnal hemoglobinuria.

5. Intracellular hemolysis is typical for:
Variants of answer:
a) sepsis;
b) acetic acid poisoning;
c) thalassemia;

d) hereditary spherocytosis;
e) anemia of G-6-PD deficiency.

6. The greatest increase in blood concentration of erythropoietin is observed by:

Variants of answer:
a) acute hemolytic anemia;
b) acute posthemorrhagic anemia;
c) chronic posthemorrhagic anemia;
d) anemia Addison-Biermer;
e) iron deficiency anemia.

7. Specify anemias that are inherited:

Variants of answer:
a) hemolytic disease of new-born;
b) paroxysmal nocturnal hemoglobinuria;
c) hereditary spherocytosis (Minkovsky-Shoffar's anemia);
d) thalassemia;
e) sickle cell anemia.

8. Recessive type of inheritance has:

Variants of answer:
a) hereditary sideroblastic anemia;
b) thalassemia;
c) anemia of G-6-PD deficiency;
d) hereditary spherocytosis (Minkovsky-Shoffar's anemia).

9. Autosomal dominant inheritance has:

Variants of answer:
a) hereditary sideroblastic anemia;
b) thalassemia;
c) anemia of G-6-PD deficiency;
d) hereditary spherocytosis (Minkovsky-Shoffar's anemia).

10. Hyperbilirubinemia is typical for:

Variants of answer:
a) hereditary spherocytosis (Minkovsky-Shoffar's anemia);
b) anemia Addison-Biermer;
c) hereditary sideroblastic anemia;
d) folic acid deficiency anemia;
e) chronic posthemorrhagic anemia.

11. Heredity hemolytic anemias membranopathias include:

Variants of answer:

a) hereditary spherocytosis (anemia Minkovsky-Shoffar's);
b) hereditary elliptocytosis;
c) G-6-PD deficiency;
d) thalassemia;
e) hereditary sideroblastic anemia.

12. Hemolytic crisis in hereditary spherocytosis Minkovsky-Shoffar's anemia include:

Variants of answer:

a) hyperbilirubinemia;
b) increased intracellular hemolysis;
c) increased intravascular hemolysis;
d) enlargement of spleen;
e) neutrophil shift to the left;
f) expressed reticulocytosis.

13 Mutation in ankyrin is the most common defect for:

Variants of answer:

a) hereditary spherocytosis (anemia Minkovsky-Shoffar's);
b) G-6-PD deficiency;
c) sickle cell anemia;
d) hereditary sideroblastic anemia;
e) thalassemia.

14. Heredity hemolytic anemias enzymopathies include:

Variants of answer:

a) hereditary spherocytosis (anemia Minkovsky-Shoffar's);
b) hereditary elliptocytosis;
c) anemia with G-6-PD deficiency;
d) thalassemia;
e) anemia with pyruvate kinase deficiency.

15. Hemolytic crisis at G-6-PD deficiency anemia occurs at:

Variants of answer:

a) using sulphonamides;
b) at night time;
c) eating fava bean;
d) eating dairy products;
e) flu.

16. Hemoglobinopathies include:
Variants of answer:
a) hereditary spherocytosis (Minkovsky-Shoffar's anemia);
b) sickle cell anemia;
c) paroxysmal nocturnal hemoglobinuria;
d) anemia Addison-Biermer;
e) thalassemia.

17. Sickle cell anemia occurs due to:
Variants of answer:
a) substitution of valine for glutamic acid in the 6-position of β-globin chain;
b) substitution of glutamic acid for tyrosine;
c) using sulfonamides;
d) infection with malaria Plasmodium;
e) deficiency of β-chain globin synthesis.

18. Specify hematological parameters typical for sickle cell anemia:
Variants of answer:
a) decrease in color index;
b) sickle shape of RBCs;
c) ESR acceleration;
d) reticulocytosis;
e) thrombocytosis.

19. Signs of thalassemia include:
Variants of answer:
a) decrease in color index;
b) sickle shape of RBCs;
c) target shape of RBCs;
d) reticulocytosis;
e) presence of RBCs with Jolly bodies and Cabot rings.

20. Acquired hemolytic anemias include:
Variants of answer:
a) thalassemia;
b) transfusion of incompatible blood group;
c) medicinal;
d) as a result of sepsis;
e) sickle cell anemia.

21. Indicate a possible causes of hemolytic disease of new-born:
Variants of answer:
a) rhesus incompatibility;

b) ABO incompatibility;
c) transfusion of incompatible blood group;
d) heredity hemaglobinopathy;
e) as a result of mother sepsis.

22. Specify hematological parameters typical for hemolytic crisis in autoimmune hemolytic anemia:

Variants of answer:
a) anisocytosis, poikilocytosis;
b) reticulocytosis (30–40 %);
c) neutrophilia;
d) hyperbilirubinemia;
e) increase in latent iron binding capacity.

23. Drug-induced immune hemolysis can appear as a result of using:

Variants of answer:
a) quinine;
b) penicillins;
c) cephalosporins;
d) dexamethazone;
e) ambroxol.

24. Specify type of antibodies that appear at paroxysmal cold hemoglobinuria (Donath-Landsteiner hemolytic anemia):

Variants of answer:
a) incomplete warm agglutinins;
b) full cold agglutinins;
c) warm hemolysins;
d) 2-phase hemolysins.

25. Paroxysmal nocturnal hemoglobinuria (Marchiafava-Micheli disease) is:

Variants of answer:
a) acquired hemolytic anemia;
b) hereditary hemolytic anemias;
c) characterized by intravascular complement-dependent hemolysis;
d) characterized by intracellular hemolysis;
e) associated with defective erythrocyte membrane;
f) associated with defective erythrocyte enzyme.

26. The reasons of nonimmune hemolytic anemias can be:

Variants of answer:

a) snake venoms;
b) uremia;
c) rhesus incompatibility;
d) hemolysins;
e) prosthetic heart valves;
f) G-6-PD deficiency.

27. Absolute and relative erythrocytosis can be distinguished by determining:

Variants of answer:

a) hematocrit;
b) concentrations of reticulocytes in hemogram;
c) ESR;
d) circulating blood volume;
e) concentrations of hemoglobin in hemogram.

28. Intensification of erythropoiesis without increasing synthesis of erythropoietin occurs at:

Variants of answer:

a) any absolute erythrocytosis;
b) erythremia (polycythaemia vera);
c) erythrocytosis caused by hypoxia;
d) any relative erythrocytosis;
e) hypernephroma (Wilm's disease).

29. Development of absolute erythrocytosis is observed:

Variants of answer:

a) combined mitral heart disease;
b) intense exercise;
c) at decreased content of 2,3-diphosphoglycerate in erythrocytes;
d) 4–5 days after acute blood loss;
e) during chronic hypoxia.

30. Secondary (symptomatic) absolute erythrocytosis can occur at:

Variants of answer:

a) erythremia;
b) kidney tumors;
c) diffuse pneumosclerosis;
d) chronic blood loss.

PATHOPHYSIOLOGY OF LEUKON. CHANGES IN QUANTITATIVE AND QUALITATIVE COMPOSITION OF WHITE BLOOD CELLS

Indicate all correct answers

1. Select functional characteristics of neutrophils:
Variants of answer:
a) carry out antitumor defence;
b) phagocytosis of bacteria cells;
c) phagocytosis of dead cells of own tissues;
d) produce antibodies;
e) generates reactive oxygen species;
f) inactivate histamine.

2. Select functional characteristics of lymphocytes:
Variants of answer:
a) antigen presenting;
b) implement a humoral and cellular links of immunity;
c) phagocytosis of microorganism;
d) inactivate histamine.

3. Select functional characteristics of eosinophils:
Variants of answer:
a) carry out antitumor defence;
b) participate in mechanisms of development of inflammation;
c) produce histamine;
d) produce antibodies;
e) inactivate histamine.

4. Specify changing a structure of neutrophils that are degenerative:
Variants of answer:
a) nuclei hypersegmentation;
b) toxigenic granularity of cytoplasm;
c) cytoplasmic vacuolation;
d) enhance nuclei dyeing;
e) presence of dust granularity in cytoplasm;
f) horseshoe-shaped nucleus.

5. Peripheral blood in acute appendicitis is characterized by:
Variants of answer:
a) leukopenia;
b) basophilia;
c) neutrophilia with shift to the left;

d) eosinophilia;
e) lymphocytosis;
f) monocytosis.

6. Peripheral blood in allergic reaction is characterized by:
Variants of answer:
a) leukocytosis;
b) basophilia;
c) neutrophilia with shift to the left;
d) eosinophilia;
e) lymphocytosis;
f) monocytosis.

7. Peripheral blood in viral infections is characterized by:
Variants of answer:
a) no change in leukocyte formula;
b) basophilia;
c) neutrophilia with shift to the left;
d) eosinophilia;
e) lymphocytosis;
f) monocytosis.

8. Peripheral blood in tuberculosis is characterized by:
Variants of answer:
a) leukocytosis;
b) basophilia;
c) neutrophilia with shift to the right;
d) eosinophilia;
e) lymphocytosis;
f) monocytosis.

9. Peripheral blood in helminthic invasions is characterized by:
Variants of answer:
a) leukocytosis;
b) basophilia;
c) neutrophilia with shift to the right;
d) eosinophilia;
e) lymphocytosis;
f) monocytopenia.

10. Peripheral blood in stage of recovery after acute infection is characterized by:
Variants of answer:
a) leukocytosis;
b) basophilia;

c) neutrophilia with shift to the left;
d) eosinophilia;
e) lymphocytosis;
f) monocytosis.

11. Peripheral blood in long treatment with glucocorticoids can be characterized by:

Variants of answer:
a) lymphocytosis;
b) lymphopenia;
c) eosinophilia;
d) eosinopenia;
e) neutrophilia;
f) neutropenia;

12. Pancytosis (increase in blood erythrocytes, leukocytes and platelets) is characteristic for:

Variants of answer:
a) chronic lymphocytic leukemia;
b) erythremia (polycythaemia vera);
c) chronic inflammation;
d) pregnancy;

13. Pathological leukocytosis can be:

Variants of answer:
a) myogenic;
b) inflammatory;
c) digestive;
d) infectious;
e) new-born.

14. Main reasons for redistributive leukocytosis are:

Variants of answer:
a) pregnancy;
b) physical exercise;
c) fever;
d) food intake;
e) pernicious vomiting;
f) intake of diuretics.

15. Physiological leukocytosis include:

Variants of answer:
a) myogenic;
b) inflammatory;

c) digestive;
d) infectious;
e) new-born.

16. Reactive leukocytosis is observed at:
Variants of answer:
a) furunculosis;
b) pregnancy;
c) otitis;
d) sense of fear;
e) pneumonia;
f) myocardial infarction.

17. Specify diseases that characterized by absolute neutrophilia:
Variants of answer:
a) acute appendicitis;
b) pneumonia;
c) typhoid fever;
d) chronic lymphocytic leukemia;
e) chronic myeloid leukemia;
f) pulmonary tuberculosis.

18. Specify changes in a peripheral blood characterize the nuclear shift of neutrophils to the right:
Variants of answer:
a) increase of band neutrophils;
b) hypersegmentation of neutrophils nuclei;
c) cytoplasmic vacuolation;
d) appearance of myelocytes;
e) leukocytosis.

19. Specify diseases accompanied by eosinophilia:
Variants of answer:
a) rubella;
b) pollinosis;
c) liver echinococcosis;
d) bacterial pneumonia;
e) acute appendicitis;
f) trichinellosis.

20. Specify diseases which are often accompanied by a development of monocytosis:
Variants of answer:
a) measles;

b) typhoid fever;
c) myocardial infarction;
d) infectious mononucleosis;
e) rubella.

21. Specify diseases that accompanied by absolute lymphocytosis:
Variants of answer:
a) immune form of agranulocytosis;
b) viral infection;
c) tuberculosis;
d) hypoplastic anemia;
e) infectious mononucleosis;
f) dehydration.

22. Specify diseases accompanied by relative lymphocytosis:
Variants of answer:
a) immune form of agranulocytosis;
b) viral infection;
c) tuberculosis;
d) hypoplastic anemia;
e) infectious mononucleosis;
f) dehydration.

23. Indicate diseases that can be accompanied by neutropenia:
Variants of answer:
a) viral hepatitis;
b) portal hypertension;
c) hypercorticoidism;
d) acute radiation sickness;
e) myocardial infarction;
f) anemia Addison-Biermer;
g) stress states.

24. Specify diseases that are characterized by eosinopenia:
Variants of answer:
a) malignant tumors;
b) acute phase response;
c) atopic dermatitis;
d) stress states;
e) myelotoxic agranulocytosis.

25. Specify diseases that are accompanied by absolute lymphopenia:
Variants of answer:
a) infectious mononucleosis;
b) hypercortisolism;

c) immune form of agranulocytosis;
d) Hodgkin's disease;
e) acute radiation sickness;
f) stress states.

26. Agranulocytosis is:
Variants of answer:
a) accumulation of agranulocytes in blood;
b) severe decrease in granulocytes in blood;
c) disappearance of specific granularity in cells.

27. Specify changes in peripheral blood that are typical for agranulocytosis:
Variants of answer:
a) significant decrease in blood neutrophils;
b) any severe leukopenia;
c) eosinopenia;
d) absolute lymphocytosis;
e) relative lymphocytosis.

28. Immune form of agranulocytosis is characterized by:
Variants of answer:
a) anemia;
b) thrombocytopenia;
c) neutropenia;
d) relative lymphocytosis;
e) absolute lymphocytosis.

29. Myelotoxic form of agranulocytosis is characterized by:
Variants of answer:
a) anemia;
b) thrombocytopenia;
c) neutropenia;
d) relative lymphocytosis;
e) lymphopenia;
f) eosinopenia.

30. Specify hematological parameters typical for leukemoid reaction myeloid type:
Variants of answer:
a) lymphoblasts in blood;
b) myeloblasts in blood;
c) myelocytes and metamyelocytes in blood;
d) absolute neutrophilia;
e) relative lymphopenia;
f) thrombocytopenia and anemia.

HEMOBLASTOSIS. LEUKEMIA

Indicate all correct answers

1. Leukemia is:
Variants of answer:
a) benign tumor of hematopoietic tissue;
b) early sign of cancer;
c) malignant tumor of hematopoietic tissue;
d) hyperleukocytosis;
e) sign of delayed-type hypersensitivity.

2. Specify etiological factors of leukemia:
Variants of answer:
a) oncogenic viruses;
b) hard infections;
c) neuropsychic disorders;
d) chemical carcinogens;
e) ionizing radiation.

3. Philadelphia chromosome is:
Variants of answer:
a) extra 21 chromosome;
b) extra sex X chromosome;
c) translocation of chromosomes site from 22 pair to 9;
d) arm deletion of 12 chromosome;
e) arm deletion of 18 chromosome.

4. Leukemia may be developed with prolonged exposure to:
Variants of answer:
a) methylbromide;
b) benzene;
c) trichlorethylene;
d) carbon tetrachloride.

5. Acute leukemia differs from chronic by:
Variants of answer:
a) presence of anemia;
b) presence of hiatus leukemicus;
c) immunodepression;
d) blast crisis;
e) blast cells in peripheral blood.

6. Leukemic form of leukemia is always characterized by:
Variants of answer:
a) leukopenia;
b) severe leukocytosis;
c) erythrocytosis;
d) disappearance of blast cells in blood;
e) basophil-eosinophilic association.

7. Aleukemic form of leukemia is characterized by:
Variants of answer:
a) absence of leukocytes in peripheral blood;
b) severe leukopenia;
c) normal number of leukocyte in blood;
d) absence of blasts in blood.

8. The term «hiatus leukemicus» refers to:
Variants of answer:
a) severe anemia;
b) leukocyte shift to the left;
c) absence of immature neutrophils with presence of blasts;
d) high ESR;
e) severe thrombocytopenia.

9. During acute leukemia in bone marrow occurs:
Variants of answer:
a) WBCs hyperplasia;
b) absence of WBCs metaplasia;
c) decrease in number of erythroid germ cells;
d) increase in number of erythroid germ cells;
e) decrease in number of megakaryocytes;
f) increase in number of megakaryocytes.

10. Specify changes in peripheral blood that are typical for acute lymphoblastic leukemia:
Variants of answer:
a) presence of blast cells with a negative reaction to lipids;
b) presence of blast cells with positive Schick reaction;
c) anemia, thrombocytopenia;
d) increase of eosinophils and basophils;
e) presence of myelocytes and promyelocytes.

11. Which of the following statements regarding acute lymphoblastic leukemia is valid:
Variants of answer:
a) tumor cells react with anti-B-cell antiserum;

b) prognosis is better if in the initial phase the WBC count is high;
c) marked splenomegaly occurs;
d) disseminated intravascular coagulation is a common complication;
e) acute lymphoblastic leukemia is predominantly a childhood disease.

12. In childhood the most common is:
Variants of answer:
a) chronic myeloid leukemia;
b) chronic lymphocytic leukemia;
c) acute lymphoblastic leukemia;
d) acute myeloid leukemia.

13. The onset of acute lymphoblastic leukemia most frequent in:
Variants of answer:
a) 10–12 years;
b) neonatal period;
c) adolescence;
d) 3–5 years;
e) 6 months.

14. Specify changes in peripheral blood that are typical for acute myeloid leukemia:
Variants of answer:
a) anemia, thrombocytopenia;
b) leukocytosis;
c) presence of blast cells with a negative reaction to lipids;
d) presence of blast cells with positive Schick reaction;
e) absolute eosinophilia and basophilia;
f) presence of Philadelphia chromosome in cells of myeloid lineage.

15. Main manifestations of acute leukemia are:
Variants of answer:
a) secondary infection;
b) anemia;
c) polyuria;
d) hemorrhage;
e) hyperglycemia.

16. Botkin — Gumprecht shadows in blood smear is:
Variants of answer:
a) hypochromic erythrocytes;
b) tear arm of Philadelphia chromosome;
c) destroyed lymphocytes (shell);
d) neutrophils with toxic granulation;
e) eosinophils achromatophils.

17. The chronic lymphocytic leukemia is characterized by:

Variants of answer:

a) anemia;

b) eosinophilia;

c) relative lymphocytosis;

d) appearance of myelocytes in blood;

e) appearance of prolymphocytes in blood;

f) appearance of Botkin — Gumprecht shadows in blood smear.

18. Specify the most characteristic sign for typical course of chronic lymphocytic leukemia:

Variants of answer:

a) leukopenia with relative lymphocytosis;

b) normal leucocytes count with absolute lymphocytosis;

c) severe leukocytosis with lymphocytosis up to 40 %;

d) severe leukocytosis with lymphocytosis up to 80 %.

19. In chronic lymphocytic leukemia:

Variants of answer:

a) absolute lymphocytosis is observed;

b) thrombocytosis is observed;

c) splenomegaly is always present;

d) Coombs positivity is possible.

20. Specify hematological parameters typical for chronic myeloid leukemia:

Variants of answer:

a) single myeloblasts in blood;

b) presence of promyelocytes and myelocytes in blood;

c) anemia, thrombocytopenia;

d) hiatus leukemicus;

e) relative lymphocytosis;

f) neutrophil shift to the right.

21. The substrate (basic cells) of multiple myeloma is:

Variants of answer:

a) reticulocytes;

b) plasma cells;

c) blast cells;

d) monocytes;

e) Botkin — Gumprecht cells.

22. Manifestations of tumor progression in leukemia may include:
Variants of answer:
a) anemia;
b) epigastric pain;
c) reticulocytosis;
d) increase in blast cells in bone marrow;
e) enlargement of lymph nodes;
f) disappearance of blast cells in blood.

23. Functional anaplasia is typical for:
Variants of answer:
a) reactive thrombocytosis;
b) chronic inflammation;
c) acute lymphoblastic leukemia;
d) chronic lymphocytic leukemia;
e) leukemoid reaction lymphocytic type.

24. Immunodepression is typical for:
Variants of answer:
a) acute lymphoblastic leukemia;
b) chronic lymphocytic leukemia;
c) leukemoid reaction lymphocytic type;
d) reactive thrombocytosis;
e) chronic monocytic leukemia.

25. Detection of Bence-Jones protein in urine is typical for:
Variants of answer:
a) acute myeloid leukemia;
b) multiple myeloma;
c) chronic B-cell lymphocytic leukemia;
d) erythremia (polycythaemia vera);
e) chronic myeloid leukemia.

26. The appearance of multiple destructions of bone tissue is typical for:
Variants of answer:
a) multiple myeloma;
b) erythremia (polycythaemia vera);
c) chronic lymphocytic leukemia;
d) acute myeloid leukemia;
e) acute lymphoblastic leukemia.

27. The infectious-septic complications of leukemia are explained by:
Variants of answer:
a) leukopenia;
b) leukemic infiltrates;
c) immature leukocytes;
d) substitution of megakaryocytic germ;
e) immunosuppression.

28. Bleeding in leukemia is associated with:
Variants of answer:
a) leukocytosis;
b) oppression of megakaryocytic germ in bone marrow;
c) thrombocytosis;
d) thrombocytopenia;
e) leukemic infiltration of liver and violation of its protein synthesis.

29. Anemia in leukemia is associated with:
Variants of answer:
a) decrease in blood circulating volume;
b) oppression of erythropoiesis;
c) inhibition of spleen function;
d) hemorrhage;
e) leukocytosis.

30. Indicate the most frequent causes of death in leukemia:
Variants of answer:
a) bleeding;
b) secondary infection;
c) bleeding in vital organs;
d) disorder of renal function.

PATHOLOGY OF HEMOSTASIS SYSTEM

Indicate all correct answers

1. Indicate a typical hemostatic disorders:
Variants of answer:
a) DIC syndrome;
b) consumption coagulopathy;
c) hemorrhagic diathesis;
d) thrombotic state;
e) prethrombotic state;
f) violation of blood rheology.

2. Promotes a platelet disaggregation:
Variants of answer:
a) adrenaline;
b) thromboxane; ATP;
d) prostacyclin;
e) serotonin.

3. Thrombotic vascular resistance is due to:
Variants of answer:
a) release of tissue thromboplastin;
b) synthesis of tissue plasminogen activator;
c) activation of anticoagulant system;
d) synthesis of prostacyclin (Pg I_2);
e) synthesis of von Willebrand factor;
f) binding of thrombin by thrombomodulin.

4. Endogenous anticoagulants include:
Variants of answer:
a) bradykinin;
b) heparin;
c) histamine;
d) antithrombin III;
e) thromboplastin;
f) protein C.

5. Vascular-platelet hemostasis can be impaired as a result of:
Variants of answer:
a) decrease a number of platelets;

b) impaired function of platelets;
c) hereditary angiopathy;
d) deficiency of VIII factor;
e) deficiency of von Willebrand factor;
f) expression of fibrinogen receptors on platelet membrane.

6. Specify the state accompanied by slowing blood clotting:
Variants of answer:
a) atherosclerosis;
b) thrombocytopenia;
c) rheumatism;
d) diffuse liver disease;
e) varicose veins;
f) overdose of anticoagulants.

7. Causes of thrombocytopenia are:
Variants of answer:
a) malignant tumors;
b) acute radiation sickness;
c) acute blood loss;
d) cytotoxic type of allergic reactions;
e) immune complex type of allergic reactions.

8. Specify a factor that causes a development of thrombocytopenia:
Variants of answer:
a) inhibition of megakaryoblasts proliferation;
b) substitution of megakaryoblasts by leukemic cells in bone marrow;
c) activation of leukopoiesis in bone marrow during inflammation;
d) increased "consumption" of platelets in process of thrombus formation;
e) immune platelet damage.

9. Specify changes that are typical for thrombocytopenic purpura:
Variants of answer:
a) increase in plasma antiplatelet antibodies (Ig G_3);
b) violation of a blood clot retraction;
c) hematoma type of bleeding;
d) petechial type of bleeding;
e) shortening of platelet lifetime.

10. During thrombocytopathy:
Variants of answer:
a) duration of bleeding is shortened;
b) duration of bleeding is prolonged;

c) activated partial thromboplastin time is prolonged;
d) activated partial thromboplastin time is shortened;
e) antithrombin III reduced;
f) antithrombin III norm.

11. Hemorrhage caused by thrombocytopathies include:
Variants of answer:
a) hemophilia C;
b) Werlhof disease;
c) von Willebrand disease;
d) Glanzmann thrombasthenia;
e) hemophilia B.

12. Indicate a mechanism of development of Glanzmann thrombasthenia:
Variants of answer:
a) absence of receptor (GP Ib) for von Willebrand factor in platelet membrane;
b) violation of factor VIII synthesis;
c) absence of receptor for fibrinogen (GP IIb / IIIa) in platelet membrane.

13. Specify changes that are typical for von Willebrand disease:
Variants of answer:
a) increase in duration of capillary bleeding;
b) prolonged duration of blood clotting time;
c) positive tourniquet test;
d) deficiency of von Willebrand factor;
e) violation of factor VIII synthesis;
f) decrease in procoagulant activity of factor VIII.

14. Causes of acquired coagulopathies are:
Variants of answer:
a) gestosis;
b) amyloidosis;
c) liver cirrhosis;
d) hemolytic jaundice;
e) hemorrhagic vasculitis;
f) production of autoimmune inhibitors.

15. At coagulopathies:
Variants of answer:
a) blood clotting time is shortened;
b) blood clotting time is prolonged;
c) activated partial thromboplastin time is prolonged;
d) activated partial thromboplastin time is shortened;

e) antithrombin III reduced;
f) antithrombin III norm.

16. Hemophilia A is characterized by:
Variants of answer:
a) deficiency of VIII clotting factor;
b) recessive X-linked inheritance;
c) prolonged prothrombin time;
d) violation of internal mechanism of formation of prothrombinase activity;
e) hematoma type of bleeding.

17. Specify changes that are typical for hemophilia:
Variants of answer:
a) increase in duration of capillary bleeding;
b) prolonged duration of blood clotting time;
c) positive tourniquet test;
d) changed thrombin time.

18. Coagulopathy due to deficiency of vitamin K-dependent clotting factors, arises at:
Variants of answer:
a) acholia;
b) enteropathies;
c) liver disease;
d) stomach disease;
e) coumarin drugs intake.

19. Causes of DIC syndrome are:
Variants of answer:
a) amniotic fluid embolism;
b) malignant tumors;
c) sepsis;
d) burns, frostbite;
e) heart failure;
f) crush syndrome.

20. The first stage of DIC is mainly related to:
Variants of answer:
a) activation of fibrinolysis;
b) activation of hemostasis;
c) depletion of clotting factors;
d) inhibition of fibrinolysis;
e) activation of primary anticoagulants.

21. At I stage of DIC syndrome:
Variants of answer:
a) blood clotting time is shortened;
b) blood clotting time is prolonged;
c) activated partial thromboplastin time is prolonged;
d) activated partial thromboplastin time is shortened;
e) paracoagulation tests positive;
f) paracoagulation tests negative.

22. The second stage of DIC is mainly related to:
Variants of answer:
a) increase a number of platelets;
b) activation of hemostasis;
c) depletion of clotting factors;
d) inhibition of fibrinolysis;
e) activation of primary anticoagulants;

23. At II stage of DIC syndrome:
Variants of answer:
a) blood clotting time is shortened;
b) blood clotting time is prolonged;
c) activated partial thromboplastin time is prolonged;
d) activated partial thromboplastin time is shortened;
e) paracoagulation tests positive;
f) paracoagulation tests negative.

24. At III stage of DIC syndrome:
Variants of answer:
a) blood clotting time is shortened;
b) blood clotting time is prolonged;
c) activated partial thromboplastin time is prolonged;
d) activated partial thromboplastin time is shortened;
e) paracoagulation tests positive;
f) paracoagulation tests negative.

25. Hemorrhagic manifestations of DIC syndrome are mainly due to:
Variants of answer:
a) depletion of fibrinogen;
b) depletion of antithrombin-III;
c) thrombocytopenia;
d) inhibition of fibrinolysis and proteolysis.

26. Causes of angiopathy are:
Variants of answer:
a) allergic reaction;
b) diabetes mellitus;
c) hypovitaminosis C and P;
d) hepatitis;
e) infectious diseases.

27. At angiopathy:
Variants of answer:
a) duration of bleeding is shortened;
b) duration of bleeding is prolonged;
c) paracoagulation tests positive;
d) paracoagulation tests negative;
e) antithrombin III reduced;
f) antithrombin III norm.

28. Specify a states accompanied by acceleration of blood clotting:
Variants of answer:
a) atherosclerosis;
b) thrombocytopenia;
c) rheumatism;
d) diffuse liver disease;
e) hypo- and avitaminosis K.

29. Causes of thrombophilia are:
Variants of answer:
a) acute hemolysis;
b) acute radiation sickness;
c) heart failure;
d) sepsis;
e) hepatitis;
f) burns, frostbite.

30. Specify pathological conditions and diseases combined with hypercoagulability:
Variants of answer:
a) deficiency of antithrombin-III;
b) systemic atherosclerosis;
c) excessive synthesis of prostacyclin;
d) prostacyclin deficiency;
e) thrombocytosis;
f) deficiency of tissue plasminogen activator.

STANDARD OF ANSWERS TO THE TEST TASKS

№ question	Correct answers	№ question	Correct answers	№ question	Correct answers	№ question	Correct answers
PATHOPHYSIOLOGY OF BLOOD. CHANGES IN TOTAL BLOOD VOLUME. BLOOD LOSS							
1	a, b	9	b,, c ,f	17	b	25	b
2	a, c, d	10	a	18	a, d	26	a, b, c, e
3	a, b, c	11	b, d, e	19	b	27	e
4	c	12	a, b, c	20	c	28	a
5	a, b	13	b, c, e, f	21	b, c	29	a
6	a	14	a, b, c	22	a	30	a, b, d, e
7	b, c, d	15	b	23	b		
8	a	16	b, d	24	c		
PATHOPHYSIOLOGY OF BLOOD. PATHOPHYSIOLOGY OF ERYTHROCYTES. DYSERYTHROPOIETIC ANEMIAS							
1	a, b, e	9	a, c, d	17	a, c, e	25	b, c, d, e
2	c	10	a, d	18	a, c, d	26	a, b, c, f
3	a, b, e	11	a, b, c	19	a, c, d, f	27	b, d, e
4	a, e	12	a, b, c	20	b, e	28	a, b, d, e, f
5	b, c, d	13	b, c, d	21	c, d, e, f	29	a, c, d, f
6	b, d	14	b, e, f	22	b, c	30	d
7	a, d	15	a, b, d, e	23	a, c, d, e, f		
8	b, c, d	16	a, b	24	a, b, c, d, e		
PATHOPHYSIOLOGY OF BLOOD. HEMOLYTIC ANEMIAS. ERYTHROCYTOSIS							
1	a, b	9	b, d	17	a	25	a, c, e
2	d	10	a, b, d	18	b, d, e	26	a, b, e
3	a, b, c	11	a, b	19	a, c, d	27	b, d
4	c, d, e	12	a, b, d, e, f	20	b, c, d	28	b
5	c, d	13	a	21	a, b	29	a, c, e
6	a	14	c, e	22	a, b, c, d	30	b, c
7	c, d, e	15	a, c, e	23	a, b, c		
8	a, c	16	b, e	24	d		
PATHOPHYSIOLOGY OF LEUKON. CHANGES IN QUANTITATIVE AND QUALITATIVE COMPOSITION OF WHITE BLOOD CELLS							
1	b, e	9	a, d	17	a, b, e	25	b, d, e, f
2	b	10	a, d, e, f	18	b, c	26	b
3	e	11	b, d, e	19	b, c, f	27	a, c, e
4	a, b, c	12	b	20	a, d, e	28	c, d
5	c	13	b, d	21	b, c, e	29	a, b, c, d, f
6	a, d, e	14	a, b, d	22	a, d	30	c, d, e
7	e, f	15	a, c, e	23	a, b, d, f		
8	a, e, f	16	a, c, e, f	24	a, b, d, e		
HEMOBLASTOSIS. LEUKEMIA							
1	c	9	a, c, e	17	a, e, f	25	b
2	a, d, e	10	a, b, c	18	d	26	a, e
3	c	11	e	19	a, d	27	c, e

№ question	Correct answers	№ question	Correct answers	№ question	Correct answers	№ question	Correct answers
4	b	12	c	20	a, b, c	28	b, d, e
5	b	13	d	21	b	29	b, d
6	b	14	a, b, d	22	a, d, e	30	a, b, c
7	c, d	15	a, b, d	23	c, d		
8	c	16	c	24	a, b, e		
PATHOLOGY OF HEMOSTASIS SYSTEM							
1	a, c, d, e	9	a, b, d, e	17	b	25	a, c
2	d, e	10	b, c, f	18	a, b, c, e	26	a, b, c, e
3	b, c, d, f	11	c, d	19	a, b, c, d, f	27	b, d, f
4	b, d, f	12	c	20	b	28	a, c
5	a, b, c, e	13	a, b, c, d, f	21	a, d, e	29	a, c, d, f
6	b, d, f	14	c, f	22	c	30	a, b, d, e, f
7	a, b, d	15	b, c, f	23	a, d, e		
8	a, b, d, e	16	a, b, d, e	24	b, c, e		

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ПО ПАТОЛОГИЧЕСКОЙ ФИЗИОЛОГИИ
(на английском языке)

Учебно-методическое пособие
для студентов 3 курса факультета по подготовке специалистов
для зарубежных стран, обучающихся на английском языке
по специальности «Лечебное дело», медицинских вузов
В трех частях

Часть 2
Патофизиология крови

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