Inflammation, fever, pain

1. **Inflammation is ..... response to pathogenic stimuli:**
   a. neurohumoral
   b. specific
   c. defence
   d. vascularized
   e. stereotypical
   f. non-specific
   g. predominantly systemic
   h. pathological

2. **The role of inflammation is:**
   a. to adapt and mobilize the whole organism
   b. to initiate a healing process
   c. autoregressive action
   d. to destroy, remove, dilute or limit a pathogenic stimulus
   e. to increase blood flow in organs
   f. targeted attack
   g. to attract and accumulate inflammatory cells at the site of damage
   h. to accumulate humorous plasma mediators at the site of the damage

3. **Defensive inflammation is:**
   a. acute inflammation
   b. beneficial for the body
   c. autoagressive inflammation
   d. localized and dysregulated
   e. prolonged inflammation
   f. normoergic inflammation
   g. autoimmune inflammation
   h. localized and regulated

4. **Causes of inflammation include:**
   a. immune cells
   b. inappropriate action of the antigen
   c. bacteria and their toxins
   d. thrombosis
   e. necrotic tissues
   f. burns and frostbite
   g. viruses
   h. foreign bodies

5. **Vascular response of inflammatory response includes:**
   a. changes in vascular permeability
   b. persistent vasodilation
   c. thermoregulation changes
   d. slowing down to stasis of blood flow
   e. phagocytosis
   f. persistent vasoconstriction
   g. hemodynamic changes
   h. microcirculation changes

6. **Inflammation is macroscopically manifested by local symptoms:**
   a. functio laesa
   b. dolor
   c. tremor
   d. febris
   e. color
   f. rubor
   g. tumor
   h. cancer

7. **Inflammatory blood plasma mediators:**
   a. are produced by the exudation of leukocytes
   b. are produced by activation and interaction of 4 proteolytic blood plasma systems
   c. increase vascular permeability
   d. provoke degranulation of neutrophils
   e. induce chemotaxis of leukocytes
   f. cause tissue damage
   g. induce pain
   h. induce fever

8. The cellular inflammatory response includes:

a. plasma leakage from microcirculation into damaged tissue
b. leukocyte leakage from microcirculation into damaged tissue
c. accumulation of neutrophils in chronic cellular response
d. accumulation of macrophages and lymphocytes in chronic cellular response
e. phagocytosis
f. pyrosis
g. accumulation of neutrophils in acute cellular response
h. hemostasis

9. The general symptoms of inflammation include:

a. leukopenia
b. increased synthesis of acute-phase proteins
c. anorexia/cachexia
d. fever
e. somnolence, fatigue
f. increased lipolysis and muscle catabolism
g. increased erythrocyte sedimentation
h. tachycardia

10. Healing is:

a. restoration of the original structure and function of damaged tissue
b. tissue reparation
c. the immediate response of the organism to damage
d. final reparation phase of the inflammatory process
e. in acute inflammation terminated by cure, scarring, or tumour
f. in chronic inflammation accompanied by destruction and fibrosis of the tissue
g. characterized by angiogenesis, fibroblasts proliferation, collagen formation
h. characterized by the action of growth factors, pro-inflammatory cytokines, and chemotactic factors

11. Acute inflammation characterizes:

a. persistence of pathogenic stimulus
b. PMN activation and accumulation
c. defense-adaptation and reparation function
d. duration up to 2 weeks
e. suffix -itis
f. presence of predominantly general signs of inflammation
g. systemic amyloidosis
h. duration from 2 to 6 weeks

12. Chronic inflammation characterizes:

a. duration of more than 6 weeks
b. tissue destruction
c. simultaneous inflammatory reaction and healing with tissue regeneration
d. disseminated intravascular coagulation
e. is a result of recurrent acute inflammation of the
f. occurs in sepsis
g. occurs in autoimmune diseases
h. presence of general signs of inflammation

13. Systemic inflammatory response syndrome (SIRS):

a. has a defensive character
b. is a generalized acute inflammatory reaction
c. must be an acute change
d. is a chronic inflammatory response
e. is a delocalized and dysregulated inflammatory process
f. in association with bacterial infection is called sepsis
g. is caused by a dramatic increase in anti-inflammatory cytokines
h. induces immunosuppression

14. Fever is:

a. clinical syndrome
b. general defence mechanism
c. non-specific diagnostic indicator of inflammation
d. overheating of the organism caused by an exogenous cause
e. controlled increase in body temperature
f. caused by exo- and endogenous pyrogens
g. an adjustment of the thermoregulation centre to a higher temperature (new-set-point)
h. modulated by endogenous antipyretics

15. Body temperature is controlled by:

a. autonomic nervous system
b. pyrogenic stimuli
c. thermoregulatory centre in the hypothalamus
d. thermoregulatory centre in the pituitary system
e. anterior hypothalamus
f. posterior hypothalamus
g. organum vasculosum laminae terminalis
h. neurons in area preoptica

16. Elevated body temperature:

a. up to 38°C is referred to as subfebris
b. up to 38°C is referred to as normothermia
c. up to 38°C causes disruption of physiological functions
d. above 41°C is referred to as hyperpyrexia
e. up to 38°C increases immune responses
f. above 42°C causes irreversible changes in the brain and other organs
g. above 38°C is referred to as febris
h. above 41°C is of purely infectious origin

17. Exogenous pyrogens include:

a. macrophages
b. pro-inflammatory cytokines
c. glucocorticoids
d. some medicines
e. bacteria
f. endotoxin
g. antigen
h. prostaglandins

18. Endogenous pyrogens include:

a. interleukin 10 (IL-10)
b. interleukin 6 (IL-6)
c. interleukin 1 (IL-1)
d. tumor necrosis factor-alpha (TNF-α)
e. lipopolysaccharide (LPS)
f. temperature shock proteins
g. interferons
h. transforming growth factor-beta (TGF-β)

19. Antipyretics (exogenous and endogenous) include:

a. cyclooxygenase inhibitors
b. interleukin 10 (IL-10)
c. non-steroidal anti-inflammatory drugs (NSAIDs)
d. anticonvulsive drugs
e. acetylcholinesterase inhibitors
f. glucocorticoids
g. acetylsalicylic acid
h. selective cyclooxygenase-2 inhibitors (coxibs)

20. Fever has several stages:

a. stadium decrementi
b. stadium incrementi
c. stadium acme et fastigii
d. stadium crisis
e. stadium lysis
f. prodromal stage
g. stage of rising in body temperature with feeling cold and chilling
h. fever culmination stage associated with increased sweating and lowering of blood pressure

21. Fever causes:

a. vascular blood flow reduction
b. dehydration
c. obstipation
d. hyperventilation
e. heart rate reduction (-8 to -10 beats/+1°C)
f. reduced secretion of pancreatic and intestinal juices
g. increased diuresis
h. CNS hyperreactivity

22. The mechanisms ensuring the formation and maintenance of body heat are:

a. thermogenesis in brown adipose tissue
b. chemical thermogenesis
c. skeletal muscles, without mechanical work
d. peripheral vasoconstriction
e. vasodilation in the skin
f. sweating
g. thermogenesis mediated by thyroid hormones
h. piloerection

23. Pain is:

a. unpleasant emotional experience associated with actual or possible tissue damage
b. clinical symptom
c. clinical syndrome
d. perception of nociception that takes place in the brain
e. sensory sense
f. warning sign
g. the body's response to tissue damage by injury, disease, or surgery
h. stimulation of nociceptors

24. Pain:

a. is always subjective

b. adapts virtually all organ systems to stress conditions
c. is a rapid reaction of microcirculation
d. is described by terms for such damage
e. is a result of hemodynamic changes
f. is objectively measurable
g. is an expected consequence of any surgery
h. is the most comprehensive human experience

25. Acute pain occurs:
a. as a direct consequence of a lesion or disease of the somatosensitivity system
b. as a result of anticancer treatment
c. directly by damage to the receptor cell (nociceptor)
d. after pressure or inadequate thermal stimulus
e. indirectly by released inflammatory mediators
f. by nerve sprouting
g. by central sensation processes
h. by direct ion irritation

26. Acute pain:
a. lasts several days or weeks, usually not exceeding 3 months
b. causal treatment is aimed at treating damaged tissue
c. the onset of pain is rapid and intense
d. is usually well-localized
e. the step-down approach is used in analgesic therapy
f. is accompanied by depressive symptoms
g. is accompanied by anxious behaviour
h. its duration exceeds 3 to 6 months

27. Chronic pain:
a. retreats after removal of the causing cause
b. emits and affects parts of the body, even very distant from the affected organ
c. we may not always know the cause
d. is triggered by psychogenic stimuli
e. is often disproportionately greater than the initially inducing stimulus
f. the step-down approach is used in analgesic therapy
g. is clinically manifested as seizure-like, sharp, very strong
h. clinically manifested as blunt, diffuse, well-localized

28. Chronic pain arises:
a. after damage to poorly myelinated Aδ and non-myelinated C-fibers
b. after CNS lesion
c. due to secondary changes
d. due to failure of antinociception pathways
e. due to sensitization of the nervous system (peripheral and central)
f. due to stimulation of nociceptors in organs, peritoneum, and pleura
g. in the relevant dermatome on the body surface
h. after activation of the opioid system

29. Neuropathic pain:
a. is referred to as "total pain"
b. occurs in neuroinfections (e.g., herpes zoster)
c. diagnostics include evidence of sensitization (e.g., hyperalgesia, allodynia)
d. is short-lasting, severe to excruciating pain
e. is triggered by psychogenic stimuli without an organic cause
f. occurs in metabolic polyneuropathies
g. occurs in multiple sclerosis
h. requires a comprehensive and long-term therapeutic approach

30. Types of pain from a pathophysiological point of view include:
a. basal
b. neuropathic
c. nociceptive
d. acute
e. cancer
f. chronic
g. ground breaking
h. idiopathic

31. Types of pain according to the course during the day include:
a. acute
b. baseline
c. breakthrough
d. biickú
e. predictable
f. spontaneous
g. procedural
h. visceral

32. The following cell types belong to the professional antigen-presenting cells:
a. dendritic cells
b. Langerhans cells
c. pancreatic beta cells

d. macrophages
e. Leydig cells
f. monocytes
g. all cells with HLA antigens
h. Purkinje cells

33. The following describes the production of antibodies:
a. chain antibody genes are found only in plasmocytes, and therefore only these produce antibodies
b. if B-lymphocyte begins to produce antibodies, we call it mast cell
c. the secondary antibody response is faster
d. the antibody variability is caused by random rearrangement of sequences in the genome with subsequent selection of clones
e. a variability of antibodies is caused by targeted genome sequence rearrangement by the antigen and its structure
f. is higher in autoimmune diseases because these patients rarely suffer from infections

34. To AIDS applies:
a. patients have a higher risk of opportunistic infections
b. rheumatoid arthritis is a frequent complication
c. patients have a higher risk of malignancy
d. it is an untreatable disease
e. patients are low at CD4+ T-lymphocytes
f. today it is the most infectious disease worldwide
g. most patients die within 1 year after infection because of severe secondary opportunistic infections
h. it is an immunodeficiency disorder, which is absent in animals

35. Anaphylactic reaction:
a. IgE immunoglobulins are crucial for anaphylaxis
b. immunoglobulin class IgD is the key to anaphylaxis
c. has the early and late phase
d. may be due to early or delayed hypersensitivity
e. if it leads to shock, then it is life-threatening because of hypertension
f. may also be induced by some drugs

36. Autoimmune diseases:
a. these include systemic lupus erythematosus
b. HLA antigens are important genetic risk factors
c. may be due to infections
d. some autoimmune diseases are transmitted by contact with a sick person
e. autoantibodies in some autoimmune diseases activate endocrine glands
f. Graves'-Basedow disease affects the thyroid gland, and therefore patients suffer from hypothyroidism

37. Type I diabetes mellitus is characterized by:
a. it occurs only in children
b. it is an autoimmune disease
c. we detect antibodies against glutamate decarboxylase
d. this disease can be prevented by avoiding cow's milk
e. antigens of some viruses are similar to beta cells antigens of the pancreas
f. relative deficiency of insulin leads to the increased peripheral tissue sensitivity to insulin

38. Rheumatoid arthritis:
a. is a disease that has also the juvenile form
b. represents the result of the long-term wearing of joints in old age
c. in most patients, rheumatoid factor is present in plasma
d. well researched and known aetiology allows us now causal biological therapy with antibodies against TNF-alpha
e. the high eosinophil count indicates that it is a disease of anaphylactic hypersensitivity
f. the treatment is symptomatic, and lifetime

39. Immune hypersensitivity can be:
a. allergic
b. early
c. cytotoxic
d. immune complex
e. delayed
f. part of AIDS
g. caused by drugs
h. independent of antigens

40. Systemic lupus erythematosus:
a. is more common in men
b. is caused by an infection frequently being transferred from dogs or wolves
c. has symptoms similar to rabies, but it is not an infectious disease
d. can affect all organs but almost never affects the skin
e. belongs to the inflammatory, but not to the infectious diseases
f. has highly variable manifestations

41. The cytokines include:
- a. interferon-gamma
- b. interleukin-4
- c. tumor necrosis factor-alpha
- d. transforming growth factor-beta
- e. HLA
- f. MHC antigens
- g. ajatin
- h. C3a, C4a, C5a

42. Cytokines:
- a. operate exclusively through paracrine mechanisms
- b. some immunoglobulins belong to cytokines
- c. ensure communication between immunocompetent cells
- d. regulate the immune response
- e. are pro-inflammatory, unlike chemokines
- f. some pass through the plasma membrane by diffusion since they are lipophilic

43. The antibodies:
- a. their particular variability is provided via posttranslational modification
- b. are not encoded in the genome, but they are gained in life, for example, by vaccination
- c. their levels increase during infection
- d. have the character of globulins but may change their structure after albumin binding to the antigen
- e. are produced by plasmocytes
- f. light chains may be produced in mitochondria

44. An antigen:
- a. genetically encoded antisense RNA against one gene
- b. is each protein that is recognized by the immune system
- c. arises after regrouping of genes similar to the production of antibodies
- d. is the genetic information for the antibody production
- e. is a non-protein substance that induces an immune response
- f. is an immunoglobulin, which binds to DNA

45. The superantigens:
- a. are encoded by corresponding genes in the bacterial genome
- b. have a structure similar to a gene
- c. lipopolysaccharide belongs to superantigens
- d. non-specifically activate immunocompetent cells non-specifically
- e. suppress immunocompetent cells and thus may induce intense inflammation
- f. in low concentrations, they are necessary for humans

46. The B-lymphocytes:
- a. are present in bone marrow
- b. are present in blood plasma
- c. have parts that are different from other cells in the genome
- d. do not have the nucleus because they are specialized for antibody production
- e. are T-lymphocytes capable of producing antibodies

47. Antibodies have:
- a. light chain
- b. the structure of immunoglobulins
- c. ability to cleave pepsin
- d. high similarity to T-cell receptors
- e. DNA-binding domain
- f. the carbohydrate component
- g. enzymatic activity
- h. their own specific receptors

48. Respiratory burst:
- a. refers to locally increased oxygen consumption
- b. refers to locally increased production of oxygen free radicals
- c. is a pathological phenomenon present in hypersensitivity reactions
- d. can be caused by neutrophilic granulocytes
- e. is enzymatically secured by the NADPH oxidase
- f. is enzymatically secured by the myeloperoxidase
- g. increases oxidative stress in tissues
- h. is one of the first steps in apoptosis

49. NADPH oxidase:
- a. catalyzes the reaction, producing oxygen and water
- b. catalyzes the reaction, producing superoxide
- c. its activity is detrimental to the healthy tissues
- d. is an antioxidant enzyme
- e. prevents oxidation of macromolecules caused by oxidative stress
- f. is produced by neutrophils when they are activated by infection

50. Nuclear factor-kappa B:
- a. regulates the expression of all genes in B-lymphocytes
- b. is activated by oxidative stress

c. is a transcription factor
d. is located only in the nucleus
e. stimulates the synthesis of immunoglobulins
f. is a proinflammatory cytokine
g. affects the activity of RNA polymerase

51. Mark the statement that is true for bacterial pathogens:
a. they are human species-specific
b. all of them produce toxins
c. all bacterial species cause disease after infection by a single bacterial cell
d. they can be attenuated by genetic modification
e. antibiotics are usually used to fight them
f. antibiotic-resistant strains represent a world health problem
g. they usually do not require antibiotic therapy
h. a compulsory state vaccination coverage is valid for several bacterial species

52. Antibiotics:
a. are substances of diverse chemical nature
b. are produced by higher vertebrate cells
c. are produced in fermenters
d. include some chemotherapeutics
e. are bacteriostatic and bactericidal
f. block the growth and division of bacteria, fungi, and viruses
g. can be ototoxic, nephrotoxic, neurotoxic
h. block the viral cell wall synthesis

Disorders of electrolytes and water

53. Therapy of isoosmotic dehydration includes:
a. supplementation of sufficient amount of water
b. administering of infusion of hyperosmolar solutions of glucose
c. administering isoosmolar solutions Na
d. no intervention, the body can cope on its own
e. infusion of isoosmolar solutions concerning isovolemia, isohydria, isoionia
f. infusion of hyperosmolar solutions Na

54. Natrium is eliminated from the body:
a. by sweating
b. via the skin (perspiratio insensibilis)
c. via GIT
d. via kidneys
e. via lungs during hyperventilation
f. via lungs during normal respiration

55. The normal values of calcium in the blood are within the range:
a. 2.25-2.75 mmol/l
b. 2.25-2.75 µmol/l
c. 2.50±0.25 mmol/l
d. 2.50±0.25 nmol/l
e. 3.50-5.00 mmol/l
f. 3.50-5.00 µmol/l

56. Transport of potassium between ICT and ECT-which statements are correct:
a. the degradation of proteins makes potassium enter cells
b. glucose enters cells along with potassium
c. when pH decreases, K^+ is transported from the blood to cells
d. transport is allowed through the potassium-calcium channel
e. H^+ is needed for the transport of K
f. K^+ enters cells from the blood when pH is increased
g. Na,K,ATPase is needed to enter cells

57. Hypocalcemia:
a. is manifested as latent tetany
b. is presented as manifest tetany
c. causes spasms in skeletal muscles
d. might lead to poliomyelitis
e. is defined as Ca in serum is lower than 2.25 µmol/l
f. is defined as Ca in serum is lower than 2.25 nmol/l
g. defined as Ca in serum is lower than 2.25 mmol/l

58. Sodium elimination through kidneys includes the following regulatory factors:
a. aldosterone reduces the elimination of sodium
b. the renin-angiotensin system reduces the elimination of sodium
c. kallikrein-kinin system increases the elimination of sodium
d. aldosterone increases the elimination of sodium
e. the renin-angiotensin system increases the elimination of sodium
f. kallikrein-kinin system decreases the elimination of sodium

59. Hypernatremia results in:
a. hyperosmolality and isotonicity
b. hyperosmolality and hypertonicity
c. hypoosmolality and hypertonicity
d. isoosmolality and hypertonicity
e. permeability of cellular water to ECS

f. reduction of water in ICS and cells shrinking
g. increase water in ICS and the expansion of cells

60. Hypoosmolality of plasma:
a. is defined as a value of osmolality < 280 mmol/kg
b. is defined as a value of osmolarity > 290 mmol/kg
c. can be caused by excess water or deficiency of sodium
d. can accompany renal insufficiency
e. can develop as a result of the lack of ADH
f. can accompany the syndrome of inadequate creation of ADH
g. can accompany hyperthyroidism
h. causes permeability of water into cells and their oedema

61. Normal values of potassium in the blood (within the normal range):
a. 5.2-6.1 µmol/l
b. 5.2-6.1 mmol/l
c. 3.8-5.1 mmol/l
d. 3.8-5.1 µmol/l
e. 3.8-5.1 nmol/l
f. 4.5 ± 0.7 mmol/l
g. 4.5 ± 0.7 µmol/l

62. Extracellular fluid (select the correct statements):
a. represents ¾ of total body water (TBW)
b. includes cerebrospinal fluid
c. includes ocular fluid
d. is a part of ICT
e. represents 2/3 of TBW (and weight)
f. K^+ contributes most to the height of osmolality ECT
g. the volume of TBW mostly depends on the contents of sodium and its anions in it
h. the osmolality of TBW depends most on the contents of sodium and its anions in it

63. Hypercalcemia:
a. reduces (alters) muscular excitability
b. is associated with patient complaints of weakness and fatigue
c. predisposes towards hypercalciuria and nephrolithiasis (when kidneys´ functioning is normal)
d. always predisposes towards osteoporosis
e. is the result of hypoparathyroidism
f. is defined by Ca in serum > 2,75 µmol/l
g. is defined by Ca in serum > 2,75 mmol/l
h. is defined by Ca in serum > 2,45 nmol/l

64. Aldosterone:
a. increases the elimination of sodium by kidneys
b. increases the reabsorption of sodium in kidneys
c. has an effect on blood pressure but not on the volume of sodium in the body
d. has a negligible effect on the amount of sodium
e. is produced in adrenal glands
f. is produced in the adrenal cortex
g. is produced in the adrenal medulla
h. is produced in the hypothalamus

65. The level of chlorides in the blood (within the normal range) is:
a. 98-113 µmol/l
b. 98-113 mmol/l
c. 120-134 mmol/l
d. 120-134 µmol/l
e. reduced when vomiting
f. results in alkalosis when reduced

66. Blood plasma (select the correct statement/s):
a. is an important part of ECT
b. communicates with interstitial fluid via capillary walls
c. in order to keep its constant volume, mainly hypothalamus plays a role
d. as dehydration occurs, the volume of plasma in the hematocrit is increased
e. as hyperhydration occurs, the volume of plasma in the hematocrit is lowered
f. as dehydration occurs, the volume of plasma in the hematocrit is lowered

67. Isoosmotic dehydration (select the correct statement/s):
a. is the result of solution losses and water at the same ratio
b. more solutions (electrolytes) disappear than water
c. more water than solutions disappear
d. is the result of a blood loss
e. is the result of significant plasma losses (e.g.burns)
f. treatment consists of applying a sufficient amount of water when consciousness is established
g. isoosmotic treatment consists of applying iso-osmolar solutions while considering isovolemia, isoionia, isohydria
h. therapy is not necessary; the body can cope on its own

68. Regulation mechanisms in sodium elimination (select the correct statement/s):

a. the most important role is played by the kidneys
b. a very important role is played by adrenal glands
c. mineralocorticoids reduce the elimination of sodium
d. hypoaldosteronism leads to an increase in sodium elimination
e. aldosterone reduces the reabsorption of sodium from primary urine
f. atrial natriuretic factor (ANP) reduces sodium elimination
g. ANP (ANF) increases sodium elimination by the kidneys

69. Potassium (select the correct statement/s):

a. its concentration in plasma is higher than that in cells
b. its concentration in a cell is approximately the same as extracellular Na^+
c. 90 % of potassium is eliminated by the kidneys
d. to a large extent is eliminated by sweating
e. is the main interstitial cation
f. considerably affects the volume of ICT
g. the osmolality of ICT depends on the amount of K^+(and its anions) in a cell

70. Hyperosmotic dehydration (select the correct statement/s):

a. is the consequence of higher losses of water than solutions
b. solution losses exceed the water losses
c. the osmolality of ECT is increased
d. the osmolality of ECT is decreased
e. the water from cells escapes and enters ECS
f. the water from ECS escapes and enters cells
g. both extra and intra-cellular dehydration arises
h. is accompanied by the sensation of thirst

71. The increased level of urea with an unchanged volume of sodium in the blood leads to:

a. hypoosmolality and hypotonicity
b. hyperosmolality and hypotonicity
c. hyperosmolality and isotonicity
d. isoosmolality and hypertonicity
e. hypoosmolality and isotonicity
f. to the release of water from ICS and its entrance into ECS

72. The level of sodium in the blood:

a. normal range is 110-120 mmol/l
b. normal range is 120-130 µmol/l
c. normal range is 135-145 mmol/l
d. normal range is 145-155 mmol/l
e. normal range is 140 ± 5 mmol/l
f. normal range is 140 ± 5 nmol/l
g. substantially affects the volume of ECT
h. substantially affects the osmolality of ECT

73. The loss of chlorides (select the correct statement/s):

a. the most common cause is vomiting
b. the most common cause is diarrhoea
c. the decrease in chlorides results in metabolic acidosis
d. the decrease in chlorides triggers the rise of bicarbonates in the blood
e. the decrease in chlorides can be the cause of metabolic alkalosis
f. in principle, the losses of Cl are more common than the losses of Cl linked to the losses of Na or K

74. Hypoosmotic dehydration leads to:

a. the transfer of water from the cells into ECT
b. the transfer of water from ECT into cells
c. the stable volume of water in ECP and ICS
d. the entrance of sodium into cells
e. the decrease in osmolality ECT
f. the increase in osmolality ECT
g. the transfer of water into cells up to the point of levelling osmolalities

75. Hyperosmolality:

a. means an increase in osmolality in the blood above 380 mmol/l
b. means an increase in osmolality in the blood above 280 mmol/l
c. hyperosmolality ECT will cause the transfer of water from cells into ECS
d. hyperosmolality ECT will cause the transfer of water from ECT into cells
e. hyperosmolality is more important than hypoosmolality
f. leads to the transfer of water up to the levelling of osmolalities ECS and ICS
g. induces thirst

76. Angiotensin II:

a. increases the sensitivity of veins to vasoconstrictive effects
b. decreases the creation of aldosterone
c. decreases the production of ADH
d. induces thirst (mainly experimentally)
e. is considered the most potent vasoconstrictive endogenous factor
f. as well as endothelin does not have a constrictive effect
g. has a vasoconstrictive effect that lasts longer than that after endothelin

77. Sodium losses from the body:

a. are important when many kidney disorders occur
b. occur when mineralocorticoids are deficient
c. are essential when there is a long-term treatment by diuretics
d. initially change osmolality in ICS
e. initially increase osmolality in ECS
f. lead to hypervolemia and the increase in blood pressure
g. can lead to the decrease in volume and osmolality ECT

78. Sodium losses from the body:

a. occur when the activity of the adrenal cortex is lowered
b. occur when the activity of the adrenal medulla is increased
c. occur in chronic pyelonephritis
d. occur when a patient is treated with antibiotics
e. are associated with an acute sensation of thirst
f. are associated with a decrease in potassium in ECS

79. Antidiuretic (ADH) hormone is produced:

a. in hypophysis
b. in the nuclei of the hypothalamus
c. in the atria of the heart
d. in the adrenal cortex
e. in the adrenal medulla
f. in n. supraopticus and n. paraventricularis
g. in the hypothalamus and stored in hypophysis from which is released and depleted when initiated by appropriate stimuli

80. Sodium sequestration (select the correct statement/s):

a. is caused by an uneven distribution of sodium in the body
b. sodium might accumulate in cavernous organs
c. sodium might accumulate in contusions of soft tissues
d. sodium is accumulated in burns
e. is caused by an excessive supply of sodium in food
f. means the fluctuation in the level of sodium in the blood during the day
g. is normal with young children
h. means differences in values of Na in relation to sex

81. Starling theory:

a. explains the exchange of fluids between intravascular and interstitial spaces
b. is based on the contradictory action of oncotic and hydrostatic pressure in capillaries
c. explains (to a certain extent) the cause of oedema accompanying nephrotic syndrome
d. is essential for the transport of electrolytes in ECS itself
e. explains the transfer of water between ECS and ICS
f. is of utmost importance to the transfer of electrolytes from ECS and ICS

82. Hyperglycaemia at normonatremia leads to:

a. hyperosmolality and isotonicity
b. isoosmolality and isotonicity
c. hyperosmolality and hypotonicity
d. hypoosmolality and hypertonicity
e. isoosmolality and hypertonicity
f. the transfer of water from the cells to ECS
g. the transfer of water to the cells from ECS

83. Aquaporins:

a. are specific water channels
b. contribute to the balancing of homeostasis of the body fluids
c. their mutations lead to pathological states connected with homeostasis disorder of body fluids
d. are specific components of blood lipid spectrum of blood
e. were identified at the beginning of the 19th century
f. affect the utilization of glucose on the periphery

84. Aquaporins are (select the correct statement/s):

a. proteins of the blood plasma which contribute to the mechanisms of natural immunity
b. proteins of the blood plasma which contribute to the mechanism of acquired immunity
c. transmembrane proteins of water channels
d. localized in endothelium and epithelium
e. abnormality of AQP 2 contributes to the rise of diabetes insipidus renalis
f. the cause of cataracts as a result of abnormality AQP 0

85. Hyperaldosteronism can induce:

a. metabolic acidosis
b. metabolic alkalosis
c. respiratory acidosis
d. respiratory alkalosis
e. an increase in reabsorption of Na in kidneys
f. an increase in osmolality and tonicity ECT

Disorders of the acid-base balance

86. Vomiting accompanying pyloric stenosis can induce:

a. metabolic acidosis
b. metabolic alkalosis
c. respiratory acidosis
d. respiratory alkalosis
e. dehydration
f. a decrease in blood pH $< 7{,}35$
g. an increase in blood pH $> 7{,}45$

87. Metabolic acidosis can be induced by:

a. vomiting accompanying pyloric stenosis
b. the intoxication by morphine
c. an increase of ketone bodies in the blood when starving
d. renal insufficiency
e. diabetes insipidus renalis
f. chronic diarrhoea
g. an increase in the concentration of bicarbonates without a corresponding change in pCO_2 in the blood
h. diabetes mellitus

88. Respiratory acidosis:

a. can be induced by vomiting at pyloric stenosis
b. can be induced by renal insufficiency
c. can be induced by a mild decrease in pO_2 in the inhaled air
d. can be induced by the morphine intoxication
e. can be induced by the chronic obstructive pulmonary disease
f. is compensated by the increased discharge of H^+ by the kidneys
g. is compensated by hyperventilation

89. Respiratory acidosis:

a. can be induced by an excessive loss of chlorides
b. can be induced by the decrease in bicarbonates without a corresponding change of pCO_2 in the blood
c. can be caused by severe chest deformities
d. can be induced by the intoxication by hypnotics
e. can be induced by the intoxication by salicylates
f. can be induced by the increase in pCO_2 without a corresponding change in bicarbonates
g. is compensated by the decrease in discharge of H^+ by the kidneys
h. is compensated by hypoventilation

90. Respiratory alkalosis:

a. can be induced by the chronic obstructive pulmonary disease
b. can be induced by severe chest deformities
c. can be induced by pulmonary oedema
d. can be induced by a local decrease of pH in the area of the respiratory centre (cerebrovascular accident)
e. can be induced by the decrease of pCO_2 in the blood without a corresponding change of bicarbonates
f. can be induced by a mild decrease of pO_2 in the inhaled air
g. is compensated by the kidneys by a decreased discharge of H^+
h. compensated by the kidneys by an increased discharge H^+

91. The increase in pCO_2 and the increase in base concentrations are associated with:

a. respiratory acidosis
b. metabolic acidosis
c. respiratory alkalosis
d. metabolic alkalosis
e. combined metabolic alkalosis with respiratory acidosis
f. combined metabolic alkalosis with respiratory acidosis
g. combined acidosis (respiratory and metabolic)
h. combined alkalosis (metabolic and respiratory)

92. The decrease in pCO_2 and the decrease in base concentrations are associated with:

a. combined metabolic alkalosis with respiratory acidosis
b. combined metabolic and respiratory alkalosis
c. combined metabolic acidosis with respiratory alkalosis
d. metabolic acidosis
e. respiratory alkalosis
f. metabolic alkalosis
g. respiratory acidosis

93. Acid-base balance:

a. isohydria is the stability of the concentration of hydrogen ions in an organism
b. the physiological pH of arterial blood is 7.3
c. the major intracellular buffer is haemoglobin
d. the major intracellular buffer is the bicarbonate buffer system
e. under physiological conditions, pCO2 is maintained at about 5.3 kPa
f. the pH shift is the result of disrupting the absolute amounts of the buffer components
g. metabolic acidosis is characterized by a shift in pH to the acidic side caused by a primary decrease in bicarbonate concentration without a corresponding

change in pCO2

h. metabolic alkalosis is characterized by a shift in pH to the alkaline side caused by a primary decrease in pCO2 without a corresponding change in bicarbonate concentration

94. Metabolic acidosis:

a. primary metabolic acidosis is characterized by a decrease in pH below 7.35 due to a primary decrease in plasma bicarbonate concentration below 22 mmol/L
b. primary metabolic acidosis is characterized by a decrease in pH below 7.35 due to a primary decrease in plasma bicarbonate concentration below 30 mmol/L * F
c. the underlying cause of ketoacidosis is insufficient glucose utilization in tissues
d. diabetic ketoacidosis is the most common ketoacidosis
e. during alcohol abuse, ketoacidosis does not develop because ethanol inhibits ketogenesis, which would occur with a predominantly insufficient caloric intake of alcoholics
f. lactic acidosis occurs when the plasma lactate level is above 6 mmol/L
g. lactic acidosis is caused by overproduction of pyruvate, associated with its reduced conversion to lactate
h. clinically, lactic acidosis is divided into a type associated with tissue hypoxia and a type without hypoxia

95. For metabolic acidosis applies:

a. primary metabolic acidosis is characterized by a decrease in pH below 7.35
b. may be caused by salicylate intoxication
c. lactic acidosis is characterized by plasma lactate levels above 6 mmol/L
d. D-lactic acidosis is caused by the production of d-lactate in patients with an overgrown bacterial flora
e. may be caused by chronic obstructive pulmonary disease
f. intravenous form of sodium bicarbonate is administered when the bicarbonate drops below 10 mmol/L
g. ammonium chloride is classically used to treat metabolic acidosis
h. may be caused by CNS disorders

Pathophysiology of the cardiovascular system

General

96. The following contractile proteins participate in myocardial contraction:

a. actin, myosin, sarcoplasmic reticulum
b. myosin, mitochondria, and sarcoplasmic reticulum
c. actin, myosin, tropomyosin, troponin
d. actin, myosin, troponin, tropomyosin, and sarcoplasmic reticulum
e. troponin and calcium
f. actin, myosin, sarcoplasmic reticulum, and sarcolemma

97. Under aerobic conditions, the heart muscle gains energy mainly by:

a. the beta-oxidation of fatty acids
b. anaerobic glycolysis
c. aerobic glycolysis
d. pentose cycle
e. glycogenolysis
f. aerobic glycolysis and glycogenolysis

98. In the myocardium, ATP is used:

a. exclusively for contraction
b. exclusively for relaxation
c. mainly for the transmembrane ion transport
d. mainly for basal metabolism
e. mainly for contraction and relaxation
f. mainly for preserving subcellular structures

99. Afterload is determined by the following factors:

a. preload and volume of blood in the venous bed
b. preload and peripheral arterial resistance
c. preload and contractility
d. the length of the muscular fibres and peripheral venous resistance
e. arterial compliance, arterial system blood volume, and peripheral arterial resistance
f. the volume of blood in the left ventricle at the end of the diastole

100. The Frank-Starling mechanism means:

a. contraction strength increases with increasing sarcomere length
b. contractile frequency increases with increasing sarcomere length
c. the tension in the left ventricular wall is directly proportional to the ventricle diameter

d. the tension in the left ventricular wall is directly proportional to the ventricle volume
e. the intraventricular pressure determines the contraction strength
f. an ATP consumption increases ventricular wall tension

101. La-Place law means:
a. the tension is directly proportional to wall thickness
b. the tension depends on sarcomere length
c. the tension depends on contractility
d. the tension increases with ventricle dilation
e. the tension increases with ventricle hypertrophy
f. only pressure overload induces ventricular hypertrophy

102. Three of the four main factors in the pathogenesis of hypertension are:
a. the blood volume in arterial bed, myocardial contractility, stiffness of large arteries
b. cardiac output, peripheral vascular resistance, stiffness of large arteries
c. stiffness of large arteries, blood volume in arterial bed, peripheral vascular resistance
d. the general blood volume, the stiffness of large arteries, stroke volume
e. preload, afterload, contractility
f. cardiac output, blood volume in arterial bed, peripheral vascular resistance

103. According to the Laplace law, the following is true:
a. wall tension is directly proportional to the wall thickness
b. wall thickness is indirectly proportional to the wall tension
c. the wall tension is indirectly proportional to the wall thickness
d. wall tension is directly proportional to intraventricular pressure and diameter of the ventricle
e. wall tension is directly proportional to intraventricular pressure and wall thickness
f. the ventricular diameter is indirectly proportional to intraventricular pressure

104. The immediate determinants of myocardial contraction are:
a. thin fibres of myosin and lactin
b. thick fibres of myosin and thin filaments of tropomyosin
c. thick fibres of troponin, tropomyosin, actin and myosin
d. troponin-tropomyosin complex
e. actin, myosin and calcium
f. fibres of actin and myosin

105. During systole and diastole, the cytoplasmatic cardiomyocyte concentration of Ca^{2+} is changing as follows:
a. from level 10^{-1} to level 10^{-5}
b. in the interval between 10^{-5} - 10^{-7} mmol/l
c. in accordance with heart demands
d. calcium concentration increases 100 times during systole
e. greater change is in systole than in diastole
f. greater change is in diastole than in systole

106. The major modifiable cardiovascular risk factors include:
a. smoking
b. obesity
c. hypertension
d. diabetes mellitus
e. high LDL cholesterol level
f. gender
g. age
h. family history of coronary artery disease

107. The non-modifiable cardiovascular risk factors include:
a. age
b. gender
c. family history of coronary artery disease
d. high blood pressure
e. hyperglycemia
f. hypernatremia
g. physical training
h. smoking

Hypertension, Ventricular hypertrophy

108. Hypertension:
a. is an increased value of arterial blood pressure in the systemic circulation
b. does not indicate an increased value of arterial blood pressure in the systemic circulation
c. the value of arterial blood pressure in the systemic circulation is reduced
d. indicates an increase in systolic and diastolic pressure above physiological values
e. indicates only an increase in systolic or diastolic pressure above physiological values of
f. is associated with a disorder of endothelial function
g. can lead to left ventricular hypertrophy

h. does not include sleep apnea syndrome as a risk factor

109. Essential hypertension:

a. has one specific cause
b. arises as a result of the action of several pathophysiological processes
c. arises from kidney damage
d. regardless of genetic causes, it affects more men than women
e. can also occur with excessive intake of NaCl
f. may arise from atherosclerosis
g. has no familial occurrence of
h. does not regulate Na + losses by reducing the volume of extracellular fluid

110. Essential hypertension:

a. does not damage blood vessels and heart in the long-term perspective N
b. contributes to the accumulation of cholesterol in the arteries and thus increases the possibility of atherosclerosis
c. can lead to long-term retinopathy
d. treatment may include the use of renin inhibitors
e. treatment does not include the use of diuretics
f. also includes alteration of renal excretory function
g. can lead to the so-called "Diseased vascular syndrome" due to damage to potassium channels
h. in untreated conditions does not lead to stroke

111. Secondary hypertension:

a. is caused by the excretion of renal vasoactive substances but not by a disorder of sodium and water excretion
b. occurs most often in people under 30 years of age as a result of renal parenchymal disease S
c. caused by renal ischemia leads to the release of renin
d. with a decrease in the functional renal parenchyma, there is an increased secretion of Na + and thus a decrease in extracellular fluid
e. is an accompanying phenomenon of adrenal cortex hyperfunction
f. is not induced by long-term excessive secretion of catecholamines
g. may occur in kidney transplantation as a result of renal artery stenosis at the site of anastomosis
h. may be induced by long-term excessive secretion of catecholamines

112. Renovascular hypertension:

a. in younger patients, it is most often caused by atherosclerosis
b. in elderly patients, it is most often caused by fibromuscular hypertrophy
c. results from decreased renin secretion due to increased renal perfusion pressure
d. results from increased renin secretion due to decreased renal perfusion pressure
e. causes hypertension when obstruction of the renal artery reduces perfusion pressure by 50%
f. in the last stage of development causes damage to the contralateral kidney
g. induces RAAS hyperactivation and salt retention leads to volume overload and pulmonary stasis
h. includes left ventricular hypertrophy as part of target organ damage

113. Renal parenchymal hypertension:

a. is the most common type of essential hypertension
b. leads to renal interstitial damage or glomerular damage
c. may also arise from diabetic nephropathy
d. is also manifested in the early stages by persistent microalbuminuria
e. usually has a more accelerated course (compared to essential hypertension) with an earlier onset of changes in renal function
f. is not most often caused by glomerulonephritis, renal insufficiency or gestational nephropathy
g. in more advanced stages leads to an increase in the values of renal parameters due to a decrease in glomerular filtration
h. in more advanced stages leads to a decrease in the values of renal parameters due to an increase in glomerular filtration

114. Endocrine hypertension:

a. belongs to secondary hypertension with overproduction of adrenal hormones
b. in addition to elevated blood pressure, it is also manifested by symptoms of the underlying endocrine disease
c. is related to the excessive action of hormones that increase the content of sodium and water in the body and do not affect cardiac output
d. caused by excessive action of hormones increases the content of sodium and water in the body and affects cardiac output and vasoconstriction
e. induced by estrogen contraception is always corrected after discontinuation of hormonal treatment
f. induced by increased aldosterone secretion increases blood pressure by decreasing sodium reabsorption
g. induced by increased aldosterone secretion increases blood pressure by stimulating sodium reabsorption with a consequent increase in extracellular volume
h. may be caused by an adenoma of the adrenal cortex, which produces aldosterone to an increased extent

115. Hypertension:

a. in android type obesity, is associated with the occurrence of insulin resistance
b. in hyperinsulinemia, it arises mainly based on activation of the sympathetic
c. does not arise based on increased adrenergic activity
d. is not caused by long-term excessive excretion of catecholamines in stress reactions
e. occurs when parasympathetic is activated by damage to the central or peripheral nervous system
f. in pregnancy (gestational hypertension) often occurs together with obesity, without signs of renal damage
g. in pregnancy, it may be a continuation of a pre-pregnancy condition, or it may be part of a pre-eclamptic syndrome
h. which is part of pre /eclamptic syndrome is accompanied by symptoms of renal and hepatic impairment

116. Hypertension:

a. in pregnancy is associated with endothelial dysfunction, which arises from hypoperfusion of the placenta
b. as a part of pre /eclamptic syndrome leads to rapidly developing oedema of the face and hands
c. in preeclampsia it is not characterized by sodium retention, increase in extracellular volume and decrease in intravascular volume as in other hypertensions
d. caused by aortic coarctation involves in the pathogenesis only increased vascular resistance caused by narrowing of the aorta
e. may be an accompanying feature of Cushing's and Conn's syndrome
f. does not occur in congenital hyperplasia of the adrenocortex
g. in Conn's syndrome it is caused by excessive secretion of cortisol
h. in Cushing's syndrome it is caused by excessive secretion of aldosterone

117. Heart hypertrophy as a response to hemodynamic overload is considered to be:

a. adaptation mechanism
b. compensatory mechanism decreasing the risk of dysrhythmia occurrence
c. compensatory mechanism reducing the stroke development
d. adaptation mechanism protecting myocardium against the wall rupture
e. the risk factor for myocardial infarction and stroke
f. compensatory mechanism but also the risk factor of sudden death, myocardial infarction, and stroke

118. Hypertrophy is defined as:

a. an [nontumorous] enlargement or overgrowth of an organ (or tissue) due to the increased size of the constituent cells
b. an [nontumorous] enlargement or overgrowth of an organ (or tissue) due to the increased number of the constituent cells
c. an [nontumorous] enlargement or overgrowth of an organ (or tissue) due to both the increased size of the constituent cells and their increased number
d. an [nontumorous] enlargement or overgrowth of an organ (or tissue) due to oedema of the interstitium
e. any rapid growth of an organ (or tissue) due to a rapidly increasing number of the constituent cells
f. any slow growth of an organ (or tissue) due to an increasing number of the constituent cells
g. an increased number of constituent cells not necessarily associated with an enlargement of an organ (or tissue)
h. any increase in the size of an organ or tissue

119. Left ventricular hypertrophy is defined as:

a. an enlargement of the left ventricle of the heart (or its part) due to the increased size of the constituent cells/cardiomyocytes
b. an enlargement of the left ventricle of the heart (or its part) due to the increased number of the constituent cells/cardiomyocytes
c. an enlargement of the left ventricle of the heart (or its part) due to both the size and increased number of the constituent cells/cardiomyocytes
d. an enlargement of the left ventricle of the heart (or its part) due to oedema of the interstitium
e. the rapid growth of the left ventricle of the heart due to the rapidly increasing number of cardiomyocytes
f. an increased number of cardiomyocytes not necessarily associated with an enlargement of the left ventricle
g. any increase in the size of the left ventricle of the heart
h. an increase in the size of the whole heart

120. Physiological left ventricular hypertrophy can be due to:

a. physiological response to exercise
b. physiological response to normal pregnancy
c. systematic training in athletes
d. arterial hypertension
e. diabetes mellitus
f. obesity
g. valvular disease
h. coronary artery disease

121. Pathological ventricular hypertrophy is an important mechanism of adaptation to increased workloads due to:

a. increased pressure the heart muscle must pump against (pressure overload)
b. increased volume that must be pumped (volume overload)
c. metabolic disorders
d. atrial fibrillation
e. reduced blood flow in coronary arteries
f. any ischemic episode associated with coronary artery disease
g. reduced blood supply throughout the collateral arteries
h. conduction defects

122. The most frequent causes of left ventricular hypertrophy due to pressure overload are:

a. arterial hypertension
b. aortic stenosis
c. chronic pulmonary disease
d. pulmonary hypertension
e. coronary artery disease
f. myocardial infarction
g. atrial fibrillation
h. ventricular tachycardia

123. The changes in hypertrophy are present at:

a. organ level
b. tissue level
c. cellular level
d. subcellular level
e. molecular level
f. metabolism level
g. energy metabolism level
h. gene expression level

124. What is affected in the complex remodelling in left ventricular hypertrophy:

a. genes expression
b. protein synthesis
c. intracellular morphology
d. gap junctions distribution
e. energy supply
f. oxygen consumption
g. structural rearrangement of myocardial tissue
h. apoptosis

125. What methods can be used for diagnosing left ventricular hypertrophy in clinical practice?

a. echocardiography
b. computed tomography
c. magnetic resonance imaging
d. electrocardiography
e. coronarography
f. phonocardiography
g. auscultation
h. intracardiac mapping

126. ECG changes characteristic of left ventricular hypertrophy include:

a. increased amplitude of QRS complex
b. increased duration of QRS complex
c. left axis deviation
d. ST depression “strain”
e. inverted T waves
f. increased duration of the P-R interval
g. reduced duration of QRS complex
h. reduced duration of QT interval

127. The common causes of right ventricular hypertrophy are:

a. pulmonary hypertension
b. tetralogy of Fallot
c. pulmonary valve stenosis
d. ventricular septal defect
e. high altitude
f. chronic obstructive pulmonary disease
g. arterial hypertension
h. aortic stenosis

128. Left ventricular hypertrophy gradually results in:

a. the disproportion between coronary blood flow and the mass of heart muscle
b. development of degenerative changes and fibrosis
c. gradual deterioration of the pumping function of the heart, leading gradually to heart failure
d. arterial hypertension
e. cardiovascular risk factors
f. valvular diseases
g. congenital heart disease
h. diabetes mellitus and metabolic syndrome

Atherosclerosis

129. These cells play a significant role in atherosclerosis:
a. endothelial cells, macrophages, smooth muscle cells
b. macrophages and microphages
c. T lymphocytes and lymphoblasts
d. thrombocytes, LDL and ROS
e. oxidative stress cells
f. oxidized LDL molecules

130. At the earliest period of atherosclerosis, the following pathology is present:
a. endothelial cells
b. fibrose plates
c. fibromuscular plates
d. foam cells
e. plaque fissures
f. thrombus

131. The basic vasodilative factors of the endothelium are the following:
a. nitric oxide
b. NO
c. nitrous oxide
d. prostacyclin
e. nitrous oxide and prostacyclin
f. PGE2 and NO

132. Vasoconstrictive factors of the endothelium are the following:
a. thromboxane A2
b. angiotensin II
c. endoperoxides of prostaglandins (such as PGE2, PGI2)
d. aldosterone
e. endothelin (E-1) and thromboxane A2
f. urobensin (U-2)

133. The important functions of the endothelium are the following:
a. regulation of vascular tone
b. regulation of thrombocyte aggregation
c. regulation of blood clotting and aggregation of thrombocytes
d. the production of haemocoagulation and fibrinolytic factors
e. the stabilisation of the basal membrane
f. vasoconstriction and hypertrophy of the vascular wall

134. The following cells participate in the process of atherosclerosis development:
a. endothelium and thrombocytes
b. endothelium and macrophages
c. macrophages and plasmocytes
d. lymphocytes, macrophages and basophils
e. endothelial cells, thrombocytes, macrophages, lymphocytes and myocytes of the vascular adventitia
f. endothelial cells, thrombocytes, macrophages and stem lymphocytes and erythrocytes

135. The most important pathogenetic factors of atherosclerosis development are the following:
a. endothelial dysfunction
b. dysfunction of LDL cholesterol
c. dysfunction of endothelium and HDL cholesterol
d. chronic infection diseases
e. vascular smooth muscle cell proliferation
f. autoimmune diseases

136. Atherosclerotic plaque becomes unstable under the following conditions:
a. inflammatory cells become to be concentrated in the plaque
b. fibrotic cap becomes too thick
c. oxidised LDL molecules tear the fibrotic cap of the plaque
d. plaque haemorrhage occurs as a result of the damage of arterioles by macrophages
e. the fibrotic cap is made progressively thinner due to the lytic action of thrombocytes
f. the cholesterol core of the plaque becomes more prominent and more liquid

137. In atherosclerosis, a heart attack resulting from a complete cut-off of the blood flow in the coronary artery can be caused by:
a. transient or permanent occlusion of the coronary artery
b. an atherosclerotic plaque fissuring and rupture
c. a thrombus superimposed on the atherosclerotic plaque
d. development of collateral arteries in the heart
e. by-pass of the main coronary arteries
f. alteration of cardiac veins
g. alteration in any of the pulmonary arteries
h. intracardiac conduction block

138. Additionally to atherosclerosis, the blood flow in coronary arteries can also be blocked by:

a. congenital defects of coronary arteries
b. spasms of the coronary artery wall
c. defects in cardiac veins
d. collateral arteries
e. collateral veins
f. intracardiac conduction defects
g. the 2nd degree of atrioventricular block

139. Atherosclerosis:

a. is a form of chronic inflammation
b. does not activate platelets
c. adversely affects blood flow through the coronary artery
d. is clinically manifested when benign changes progress to atherothrombosis
e. manifests most often at a young age
f. also affects mediosclerosis
g. is identical with arteriosclerosis
h. in the first stages, it forms fat streaks, which are formed at the site of focal increase of lipoproteins

140. Atherosclerotic plaque:

a. is formed on the side into the lumen of the vessel by a fibrous cap
b. it also consists of a slurry core which does not contain necrotic material
c. contains solid calcium deposits in the vicinity of the necrotic nucleus
d. it contains fissures at the edge, which are the place of origin of the thrombus
e. at the site of the fissures is not the site of haemorrhage into the plaque
f. often occurs in the abdominal aorta
g. is not affected by hemodynamic conditions in the arteries
h. is formed on the uppermost layer of the fibrous cap by the endothelium

Coronary artery disease, myocardial infarction

141. The following states are considered to be the complication of myocardial infarction:

a. general adaptive syndrome
b. ventricular dysrhythmias
c. myocarditis
d. the Frank-Starling mechanism
e. ischemic degeneration of the brain
f. atherosclerosis of the coronary arteries

142. A major sign of myocardial infarction is:

a. coronary thrombosis
b. endocardial necrosis
c. myocardial necrosis
d. relative mitral insufficiency
e. sudden death
f. intensive and prolonged chest pain

143. Typical ECG sign of myocardial necrosis is:

a. ST-elevation less than 2mm
b. ST-elevation more than 2mm
c. ST-elevation more than 3 mm
d. negative coronary T wave
e. pathological Q wave
f. pathological „sheep wave“

144. A patient with ischemic heart disease has chest pain because:

a. he/she is under stress
b. the coronary artery contracts in the effort
c. the coronary artery suffers oxygen insufficiency
d. physical activity depletes oxygen
e. the atherosclerotic artery is stiff and does not respond to oxygen demands
f. the coronary artery is under the influence of the sympathetic nervous system

145. Complications of myocardial infarction are:

a. left ventricle rupture and Dressler pericarditis
b. ventricular tachycardia
c. fatal dysrhythmias
d. cor pulmonale
e. left heart failure
f. cardiogenic shock

146. In myocardial infarction, the following issues occur:

a. necrosis of the myocardium
b. non-fatal and fatal dysrhythmias
c. ST-segment elevation
d. fatal ischemia of cardiomyocytes
e. cardiogenic and obstructive shock
f. high-prominent T waves

147. Coronary artery disease is defined as:

a. a narrowing or blockage of coronary arteries that provide oxygen and nutrients to the heart
b. a narrowing or blockage of the main veins of the heart
c. development of collateral arteries
d. atrial insufficiency
e. any ischemic episode of the myocardium
f. a narrowing or blockage of carotid arteries
g. alteration in any of the pulmonary arteries
h. a mechanism of ischemic pre-conditioning

148. Anterior myocardial infarction is caused by occlusion of:

a. anterior interventricular branch of the left coronary artery (left anterior descending artery)
b. circumflex branch of left coronary artery (Left circumflex artery)
c. right coronary artery
d. any of the coronary arteries
e. all coronary arteries
f. any of the pulmonary arteries
g. left carotid artery
h. right carotid artery

149. Additionally to atherosclerosis, the blood flow in coronary arteries can also be blocked by:

a. congenital defects of coronary arteries
b. spasms of the coronary artery wall
c. defects in cardiac veins
d. collateral arteries
e. collateral veins
f. intracardiac conduction defects
g. the 2nd degree of atrioventricular block

150. Cardiac markers that are released in cardiac injury and used in clinical praxis for diagnosing myocardial infarction are:

a. creatine kinase
b. troponins
c. myoglobin
d. phospholipids
e. acetylcholine precursors
f. adrenaline precursors
g. histamine
h. creatinine clearance

151. Ischemic heart disease:

a. occurs only in the presence of clinical signs
b. manifests as angina pectoris, but not as heart rhythm disorder or heart failure
c. in terms of pathophysiology, it includes angina pectoris, myocardial ischaemia and coronary heart disease
d. an early indicator has an LDL level that correlates with the occurrence of acute myocardial infarction
e. covers the spectrum of diseases affecting the coronary arteries
f. in acute forms, it includes stable angina pectoris
g. occurs most often based on vasospasm
h. occurs most often based on atherosclerosis

152. Myocardial ischemia:

a. occurs when the heart's oxygen demand is greater than its oxygen supply
b. in the case of fixed coronary stenosis, it manifests itself in increased metabolic demands exceeding the flow reserve
c. involves the degradation of high-energy phosphates and phosphocreatinine as part of initial changes
d. may occur when the oxygen content in the blood is reduced, e.g. in case of congenital heart defects or severe anaemia
e. may be manifested by a disorder of diastolic relaxation
f. occurs during physical or mental stress, but most often occurs spontaneously
g. with tachycardia leads to shortening of diastole and thus to an increase in coronary flow
h. causes complete necrosis of the ischemic area in 1 - 4 hours

153. Ischemic-reperfusion injury of the coronary artery:

a. reduces NO production by the endothelium of the capillary bed
b. increases NO production by the endothelium of the capillary bed
c. causes a "no-reflow" phenomenon in which capillaries become clogged with leukocytes
d. reduces the release of NO from the endothelium of the coronary artery
e. increases the adhesion of neutrophils to the endothelium of capillaries
f. reduces the adhesion of neutrophils to the capillary endothelium
g. increases the release of NO from the endothelium of the coronary artery
h. causes a "no-reflow" phenomenon in which capillaries become blocked by neutrophils

154. Atherosclerosis and coronary heart disease:

a. the process of atherosclerosis is completed by the formation of a fibrolipid plaque

b. atherosclerotic plaque passes into the lumen of the coronary arteries without changes in the circular cross-section of the vessels
c. in coronary arteries affected by atherosclerosis, there is an increase in flow
d. thrombus is caused by damage to the endothelium on the plaque cap
e. a thrombus is formed by the formation of a cleft on the plaque cap
f. haemorrhage in the plaque nucleus causes the peeling of especially stable plaques
g. the formation of a cap endothelial crack is not affected by an increase in systolic pressure
h. thrombus remodelling without clinical manifestation is the basis of the progression of coronary atherosclerosis

155. Atherosclerotic plaques:
a. with nuclear thrombosis are considered stable
b. in which the reconstruction takes place, reduce the possibility of thrombosis
c. are, within their stability, affected in principle only by the inflammatory process
d. composed of more than 70% fibrous tissue is considered unstable
e. induce clinical signs of atherosclerosis before restricting the flow
f. may not appear on angiography
g. which are circular and encircle the entire circumference of the artery, do not interfere with the lumen
h. with nuclear thrombosis considered to be unstable

156. Angina pectoris:
a. is a syndrome caused by transient myocardial ischemia
b. is an asymptomatic manifestation of transient myocardial ischemia
c. resolves only after administration of nitroglycerin
d. occurs when myocardial oxygen consumption exceeds the coronary circulation capacity
e. variant - arises as a consequence of spasm of the epicardial part of the coronary vessels
f. unstable - not related to early transition to acute myocardial infarction
g. may manifest as coronary heart disease with heart failure
h. may manifest as coronary heart disease with arrhythmia

157. Clinical intervention in angina pectoris by nitrate administration
a. is aimed at reducing the preload
b. is aimed at dilating the arteries and reducing peripheral resistance
c. improves chamber emptying with smaller volume in venous dilatation
d. improves the overall oxygen balance
e. helps redistribution of blood to the ischemic lesion
f. releases spasms in unstable angina pectoris
g. causes redness and headaches upon induction of vasodilation
h. induces sequestration of intracellular Ca 2+, thereby ensuring relaxation

158. Acute myocardial infarction (AMI):
a. anaemic necrosis occurs even without coronary artery obstruction
b. AMI diffuse - occurs as a transmural or nontransmural infarction
c. causes necrosis, which increases even after early intervention
d. causes necrosis, which is replaced by fibrosis
e. AMI transmural - affects necrosis of almost the entire wall thickness of the right ventricle
f. AMI transmural - affects only the subendocardial or intramural part of the myocardium
g. AMI non-transmural - affects necrosis of almost the entire thickness of the left ventricular wall
h. causes endothelial cell oedema due to hypoxia

159. Acute myocardial infarction:
a. in the adaptation phase, induces remodelling of the right ventricle
b. in the adaptation phase, it causes the expansion of the infarction
c. as part of the expansion of the infarction causes a decrease in the volume of discharge
d. leads to compensatory hypertrophy of the unaffected myocardium
e. induces stimulation of the parasympathetic nervous system
f. which affects 15% of the left ventricle, causes left ventricle deficiency
g. which affects 40% of the left ventricle, causes cardiogenic shock
h. may affect the atria or right ventricle due to another underlying disease

160. Acute myocardial infarction:
a. affects women to a lesser extent due to the protective effect of estrogen
b. can cause hemodynamically significant arrhythmias even in the early phase
c. is also diagnosed using non-specific creatine kinase levels
d. is diagnosed based on a specific marker - troponin
e. cannot cause pericardial effusion to pericarditis
f. of the NSTEMI type arises based on occlusion
g. of the STEMI type arises based on stenosis
h. STEMI type causes subepicardial ischemia

Reperfusion syndrome

161. The oxygen paradox means that:
a. the heart can utilize either oxygen or hydrogen

b. the heart utilizes nitrogen in addition to oxygen
c. the heart utilizes CO_2 but only during the nighttime
d. the patient collapsed after restitution of oxygen delivery
e. the restitution of oxygen delivery paradoxically damages the myocardium
f. the restitution of calcium delivery paradoxically increases contractility

162. Because of the oxygen paradox:
a. we should avoid resuscitation to prevent additional damage
b. we perform resuscitation up to 4 h after heart arrest
c. we try to avoid the restitution of myocardial perfusion
d. we never reperfuse the myocardium
e. we try to terminate the reperfusion as early as possible
f. there is evidence that ischemia leads to superior outcomes over reperfusion

163. In the calcium paradox following is present:
a. excessive calcium influx and disturbed production of ATP
b. excessive influx of Ca^{2+} through the Na/K channel
c. calcium overload of mitochondria
d. irreversible contractures
e. tears in sarcolemma
f. down-regulation of beta-receptors

164. Reperfusion syndrome:
a. can save damaged myocytes but also destroy them completely
b. is the tissue damage caused when blood supply returns to tissue after a period of ischemia or lack of oxygen
c. the benefit depends on the time that has elapsed since the occlusion
d. reoxygenation produces completely different changes than reperfusion with calcium solution after calcium-free perfusion
e. does not lead to the accumulation of calcium in the heart muscle cell
f. oxygen radicals are responsible for sarcolemma damage and cardiomyocyte overload with calcium
g. is caused by the oxygen and calcium paradox
h. within 24 hours, reperfusion is clearly beneficial (more cells are saved by reperfusion than destroyed)

165. Tolerated ischemia:
a. occurs when the coronary flow rate drops to about 80%
b. occurs when coronary flow drops to about 50% * T
c. is characteristic of chronic myocardial ischemia
d. ATP is produced mainly from beta-oxidation of fatty acids
e. ATP is produced mainly from the glycolytic cleavage of glucose
f. is accompanied by a decrease in heart muscle performance
g. necrosis does not occur
h. necrosis occurs

166. Calcium paradox:
a. is perfusion without calcium and subsequent reperfusion with a calcium solution
b. is perfusion with calcium and subsequent reperfusion without calcium solution
c. damage can result in so-called stone heart
d. can lead to damage in the glycocalyx
e. during calcium-free perfusion, the heart stops
f. with excessive calcium entry, mitochondria are overloaded with Ca^{2+} and subsequent ATP depletion follows
g. gap junctions may be disrupted between cardiomyocytes
h. the heart does not stop during calcium-free perfusion

167. Oxygen paradox:
a. is perfusion without oxygen or interruption of perfusion and subsequent reperfusion with oxygen
b. the only defence mechanism that cells have developed against oxygen-derived free radicals is antioxidants
c. oxygen radicals are responsible for sarcolemma damage and cardiomyocyte overload with calcium
d. the main oxygen radicals are $\cdot O_2^-, H_2O_2, \cdot OH^-$
e. one of the pathways of free radical production is disruption of the ATP degradation products metabolism
f. under physiological conditions, free radicals are formed mainly in the intercellular space
g. the main consequences are calcium overload of the cells with the formation of irreversible contractures, ATP depletion and cell lysis
h. reoxygenation produces completely different changes than reperfusion with calcium solution after calcium-free perfusion

168. Consequences of reperfusion:
a. myoglobin leakage
b. potassium leakage
c. calcium paradox
d. irreversible contractures
e. accumulation of calcium in the heart muscle cells
f. oxygen paradox
g. total recovery of cardiac tissue

h. the benefit depends on the time that has elapsed since the occlusion

Valvular diseases

169. The most frequent cause of mitral stenosis is:
a. heart failure with „relative“ mitral stenosis
b. breathlessness
c. embolization into the arterial system
d. atrial fibrillation and cyanosis
e. rheumatic fever
f. bacterial endocarditis

170. One of the consequences of mitral stenosis is:
a. arterial embolism
b. pulmonary embolism
c. cor pulmonale acutum
d. left ventricular hypertrophy
e. relative mitral insufficiency
f. foramen ovale apertum

171. The typical manifestations of aortic stenosis are as follows:
a. collapse, stenocardia, sudden death
b. shock and eccentric hypertrophy of the left ventricle
c. palpitations and peripheral cyanosis
d. diastolic murmur
e. cyanosis and repeated thromboembolism
f. surprisingly good tolerance of the increased-physical activity

172. Murmurs in aortic insufficiency are:
a. systolic
b. diastolic
c. systolic-diastolic
d. diastolic-systolic
e. opening mitral clap
f. closing aortal tone

173. A murmur in aortic stenosis radiates to:
a. the back
b. the axilla
c. the maxilla
d. the apex
e. the Erb point
f. carotid arteries

174. In aortic stenosis, the following pathology occurs:
a. concentric hypertrophy of the left ventricle
b. eccentric hypertrophy of the left ventricle
c. eccentric hypertrophy of the left and right ventricles
d. concentric hypertrophy of the left atrium and ventricle
e. septal defect
f. dilatation of both ventricles

175. A large systolic-to-diastolic amplitude means that:
a. both systolic and diastolic pressures are high
b. there is a significant difference between systolic and diastolic blood pressure
c. diastolic blood pressure is high, but systolic blood pressure is low
d. both pressures are under 100 mmHg
e. both systolic and diastolic pressures are normal, but the difference between them is augmented
f. systolic and diastolic blood pressure are periodically changing

176. Large systolic-diastolic amplitude is typical for:
a. aortic insufficiency
b. mitral insufficiency
c. ventricular septal defect
d. aortic and mitral insufficiency
e. aortic stenosis
f. aortic and mitral stenosis

177. The systolic murmur in aortic stenosis is:
a. rough and noisy
b. gentle, highly pitched
c. audible during defecation and Valsalva manoeuvre
d. the most common murmur in Caucasians
e. audible in Erb’s point
f. almost inaudible but easily detectable by echocardiography

178. The cause of embolism in mitral stenosis is:
a. dilatation of the right atria and thrombi formation
b. dilatation and fibrillation of the left atria with turbulent blood flow
c. blood stagnation in the left atrial auriculum
d. thrombus formation in the left ventricle as a result of LV failure and dilatation
e. hypercoagulative state with thrombus formation in large arteries

f. heart failure with congestion and with chronic venous insufficiency

179. In the Fallot tetralogy, the following is present:
a. the defect of the atrial septum
b. the defect of the ventricular septum and the aorta
c. dextroposition of the aorta
d. hypertrophy of the right ventricle
e. the atrial septum defect, dextroposition of the aorta, hypertrophy of the right ventricle
f. right ventricle hypertrophy and dextroposition of the pulmonary artery

180. Typical signs and symptoms of aortic stenosis are:
a. sudden cardiac death
b. fatal dysrhythmia as a result of the sick-sinus syndrome
c. pulmonary embolism
d. collapse and angina pectoris
e. atrial fibrillation and left heart failure
f. collapse with shock development

181. The following conditions are not typical in aortic insufficiency:
a. systolic-diastolic murmur
b. high diastolic and low systolic blood pressure
c. large systolic-diastolic amplitude
d. frequent thrombi in the left ventricle
e. systolic Flint-Austin murmur
f. pulse "celer et altus"

182. The auscultation finding in mitral stenosis is following:
a. protodiastolic murmur and accentuation of the first sound
b. holosystolic murmur with presystolic accentuation
c. accentuation of the first sound and opening mitral snap
d. mesodiastolic murmur, accentuation of the first sound and opening mitral snap
e. accentuation of the first sound and gallop rhythm
f. holodiastolic murmur with presystolic accentuation

Cardiomyopathies

183. Primary cardiomyopathy involves:
a. inflammatory damage of the myocardium
b. myocardial damage by unknown bacteria or virus
c. primary myocardial damage of unknown aetiology
d. an acute heart dilation of unknown genesis
e. left ventricular hypertrophy with a bad prognosis
f. a secondary myocardial damage

184. Dilatation cardiomyopathy is characterized by:
a. left ventricle dilatation and low ejection fraction
b. right ventricle hypertrophy and left ventricle dilatation
c. signs of previous inflammation
d. severe aortic stenosis with dilatation
e. benign myocardial damage
f. thromboembolic disease with cor pulmonale

185. Infiltrative cardiomyopathies that look like hypertrophic or hypertensive heart disease include:
a. cardiac amyloidosis
b. cardiac oxalosis
c. cardiac mucopolysaccharidosis
d. aortic stenosis
e. pulmonary stenosis
f. pulmonary embolism
g. arterial hypertension
h. valvular diseases

186. Cardiomyopathies
a. a group of various heart diseases, which are chronic, idiopathic pathological processes affects mainly the heart muscle
b. cardiomyopathies include ischemic and inflammatory myocardial damage
c. cardiomyopathies do not include ischemic and inflammatory myocardial damage
d. at present, cardiomyopathies are divided into dilatational, hypertrophic and restrictive
e. at present, cardiomyopathies are divided into dilatational, hypotrophic and restrictive
f. have an unclear aetiology
g. arise in the context of extracardiac underlying disease
h. if the myocardium is affected in the framework of extracardiac underlying disease, we speak of specific heart muscle diseases, not cardiomyopathy

187. Cardiomyopathies
a. for dilated cardiomyopathy is true: dilatation of the left ventricle as well as the left atrium and right part of the heart
b. dilated cardiomyopathy has a progressive character and a poor prognosis

c. in the development of dilated cardiomyopathy, the simultaneous action of several potential etiological factors is necessary
d. endomyocardial fibrosis is characterized by thickening of the endocardium due to the proliferation of collagen fibres
e. myocardial fibroelastosis is a congenital disease in children
f. hypertrophic cardiomyopathy is an autosomal dominant disease
g. the main feature of hypertrophic cardiomyopathy is hypertrophy of some part of the left ventricular muscle
h. restriction cardiomyopathies are endomyocardial fibrosis and myocardial fibroelastosis

Arrhythmias

188. In atrial fibrillation, there is a high risk of peripheral embolism because:
a. the patient is dehydrated and does not drink
b. thrombi are formed in the lower extremities
c. thrombi are formed in the pulmonary artery
d. thrombi are formed in the left atrium
e. thrombi are formed in the middle auricle
f. fibrillation is associated with mitral stenosis

189. The most common cause of atrial fibrillation is:
a. hypertension, hypertrophy and failure of the left ventricle
b. hyperthyroidism and mitral insufficiency
c. mitral stenosis and Cushing syndrome
d. Addison disease
e. myocardial infarction and sudden cardiac death
f. emotional stress

190. Ventricular tachycardia is triggered by:
a. long QT interval
b. 3rd degree AV blockade
c. sick sinus syndrome
d. long PQ interval
e. re-entry, pathological automacy or trigger mechanism
f. ionic dysbalance, mainly hypopotassemia

191. 3rd degree AV blockade is manifested as:
a. sick sinus syndrome
b. tachycardia
c. chest pain
d. bradycardia and loss of consciousness
e. atrial fibrillation
f. long PQ interval

192. The complication of atrial fibrillation is:
a. the development of pulmonary and arterial hypertension
b. the embolism into the arterial and venous systems
c. the thrombus development in the left atrium with subsequent pulmonary embolism
d. embolism into brain arteries
e. hemodynamically severe tachyarrhythmia
f. atrial flutter development

193. The first-degree atrioventricular block in electrocardiogram has the following characteristics:
a. P wave precedes each QRS complex, but the PR interval is prolonged to > 20 ms
b. P waves are completely missing
c. P waves are replaced by irregular low voltage waves
d. every second QRS is missing the preceding P wave
e. every second P wave is not followed by a QRS complex
f. P waves are replaced by the isoelectric line
g. P wave precedes each QRS complex, but the PR interval is shortened to 10 ms
h. P waves are superimposed into the QRS complex

194. In a normal electrocardiogram, the duration of the QRS complex is:
a. 60 -100 ms
b. 20 - 40 ms
c. 40 - 60 ms
d. 120 - 140 ms
e. 140 - 180 ms
f. 180 – 200 ms
g. 200 – 240 ms
h. 240 – 280 ms

195. In a normal electrocardiogram, the electrical axis in the frontal plane ranges between:
a. -30 and +90 degrees
b. 0 and 120 degrees
c. - 30 and -45 degrees
d. 90 – 120 degrees
e. 120 – 180 degrees

f. 90 – 180 degrees
g. -30 and -120 degrees
h. -30 and – 180 degrees

196. In a normal electrocardiogram, the T waves are:
a. concordant with the QRS complexes
b. discordant with the QRS complexes in all leads
c. concordant with the QRS complexes only in limb leads
d. concordant with the QRS complexes only in precordial leads
e. discordant with the QRS complexes only in limb leads
f. discordant with the QRS complexes only in precordial leads
g. not related to QRS complexes
h. concordant with the QRS complexes in limb leads and discordant in precordial leads

197. Sinus bradycardia is defined as heart rate:
a. < 60 beats/ min
b. > 60 beats/ min
c. > 70 beats/ min
d. between 60 and 70 beats/ min
e. between 70 and 90 beats/ min
f. between 90 and 120 beats/ min
g. > 80 beats/ min
h. > 120 beats/ min

198. In bundle branch block, the duration of the QRS complex of the electrocardiogram is:
a. > 120 ms
b. < 120 ms
c. between 80 – 100 ms
d. < 80 ms
e. between 80 – 120 ms
f. normal
g. < 90 ms
h. < 60 ms

199. Factors that may increase the risk of arrhythmias include:
a. excess caffeine
b. stress
c. smoking
d. alcohol abuse
e. diet pills
f. antidepressants
g. antiemetics
h. dissecting aneurysm

200. Some tachyarrhythmias may cause noticeable symptoms, such as:
a. syncope
b. hypothermia
c. a sensation of heart fluttering (palpitations)
d. jaundice
e. fatigue
f. dyspnoea
g. chest pain
h. sudden death

201. An arrhythmia can be caused by:
a. the heart's natural pacemaker damage
b. the normal conduction path being interrupted
c. the presence of abnormal accessory pathways
d. the thyroid gland problems
e. anaphylaxis
f. AV region developing abnormal rate
g. SA node developing an abnormal rate
h. alpha1-antitrypsin deficiency

202. Heart-related conditions increasing the risk of arrhythmias include:
a. coronary artery disease
b. atrophy
c. heart muscle damage after myocardial infarction
d. inflammatory process
e. cardiomyopathy
f. barbiturate poisoning
g. heart irradiation
h. pneumonia

203. Tests for diagnosis of arrhythmias can include:
a. blood tests
b. standard ECG
c. echocardiogram
d. 24-hour Holter monitor (a portable EKG)
e. perfusion lung scan
f. electrophysiological study
g. genetic tests

h. pulse oximetry

204. Treatment of tachyarrhythmias can include:
a. antiarrhythmics
b. cardioversion
c. automatic implantable defibrillator
d. pacemaker
e. ablation
f. correction of electrolyte dysbalance
g. correction of hormonal dysbalance
h. fluid restriction

205. Cardiac tachyarrhythmias are generally produced by mechanisms, such as:
a. enhanced automaticity
b. decreased automaticity
c. triggered activity
d. functional reentry
e. anatomical reentry
f. embolic complications
g. CNS damage
h. increased blood flow in coronary aa.

206. Consequences of tachyarrhythmias are:
a. LV dysfunction
b. reduction of blood flow in coronary arteries
c. embolic complications
d. damage of CNS
e. sudden cardiac death
f. increased blood flow in coronary arteries
g. Cor pulmonale

207. The heart rate of tachycardia is:
a. 150-250 beats/min
b. 150-250 beats/sec
c. 400-600 beats/min
d. 250-400 beats/min
e. 50-90 beats/min
f. 50-90 beats/sec
g. 800-900 beats/min
h. unmeasurable

208. Reentry mechanism requires:
a. two different pathways with different conduction velocity
b. two different pathways with different refractory period
c. slow pathway
d. unidirectional block in one pathway
e. unidirectional block in two pathways
f. returning the impulse to the original site
g. fast pathway
h. extrasystole, which follows rapidly upon the previous beat

209. Reentry is the electrophysiologic mechanism responsible for:
a. ventricular tachycardia
b. ventricular fibrillation
c. AV nodal reentry tachycardia
d. AV reentry tachycardia
e. atrial fibrillation
f. atrial flutter
g. AV block
h. sick sinus syndrome

210. Ventricular tachycardia is characterized by:
a. originating below His bundle
b. originating in one of the lower chambers
c. origin above His bundle
d. accumulation of more than 6 wide ventricular complexes
e. frequent association with severe heart disease
f. heart rate more than 150 beats/min
g. risk of losing consciousness
h. pleural effusion

211. Sudden cardiac death is occurring:
a. as a natural death
b. as an unexpected death
c. within one hour after symptoms begin
d. within 6 hours after symptoms begin
e. frequently in people with known or suspected heart disease
f. frequently in people with no known cardiac abnormalities
g. in association with ventricular tachyarrhythmias in most cases

212. Bradyarrhythmia:
a. is characterized by a short heart
b. is characterized by increased heart rate

c. is characterized by reduced heart rate
d. is characterized by non-sinus rhythm
e. is always pathological
f. is the same as brachycardia

213. Bradycardia:
a. is a pleasant emotional feeling
b. is a comfortable feeling of satisfaction at the heart
c. should be the aim of each cardiovascular therapy
d. leads to increased cardiac output
e. may be compensated by contraction of pulmonary veins and simultaneous dilation of pulmonary arteries
f. may be compensated by contraction of pulmonary arteries and simultaneous dilation of pulmonary veins

214. Sinus node:
a. produces waves of sinus frequency
b. has the shape of an inverted sinusoid
c. is localized in the sinus cavernosum
d. is the replacement pacemaker of the heart
e. is localized in the AV junction
f. is the primary pacemaker of the heart

215. The AV node:
a. produces waves of sinus frequency
b. has the shape of an inverted sinusoid
c. is localized in the sinus cavernosum
d. is the replacement pacemaker of the heart
e. is localized in the AV junction
f. is the primary pacemaker of the heart

216. The generation of stimuli in the sinus node:
a. is based on early or late afterdepolarization (so-called trigger mechanism)
b. is based on the formation of prepotential or spontaneous diastolic depolarization
c. is randomly irregular
d. is modulated by the sympathetic as well as the parasympathetic nervous system
e. is the direct consequence of the innervation of the sinus node by the vagal nerve
f. has no meaning

217. Spontaneous diastolic depolarization:
a. is enabled by higher plasma membrane permeability for kations of the cells in the sinus node
b. is enabled by higher plasma membrane permeability for anions of the cells in the sinus node
c. is supported by the highly effective Na^+/K^+-ATPase in the sinus node cells
d. is supported by the lower efficacy of the Na^+/K^+-ATPase in the sinus node cells
e. enables correct repolarization of ventricular cardiomyocytes
f. leads to achieving the threshold potential

218. Normal heart rate:
a. is irregularly unpredictable
b. is completely irrelevant
c. is over 120 bpm
d. is less than 60 bpm
e. enables the development and regression of the financial crisis
f. causes myocardial infarction

219. Bradyarrhythmias may be caused by:
a. disorders in electrical impulse generation
b. disorders in conduction
c. increased excitability of the myocardium
d. reentry mechanism
e. trigger mechanism
f. the right shift of the pressure-volume curve

220. Sick-sinus syndrome:
a. is characterized by permanent tachycardia
b. may present as intermittent bradycardias, tachycardias or sinus arrests
c. is characterized by a remarkable, sharp P wave
d. is characterized by a prolonged two-peak P wave
e. is associated with thromboembolic risk
f. is the most common cause of sudden cardiac death

221. Sick-sinus syndrome may be underlined by:
a. amyloid deposits in the node and perinodal tissue
b. fibrotic scar in the apical myocardium
c. significant loss of nodal cells
d. hypoplasia or sinus node atrophy
e. idiopathic changes in the sinus node
f. idiotic changes of the brain cortex

222. 1st degree AV blockade:

a. is characterized by increasing prolongation of PQ interval
b. is characterized by constant prolongation of the PQ interval
c. is characterized by some missed QRS complexes after the previous P wave
d. is characterized by non-constant PQ interval duration
e. the action of the ventricles is independent of atrial excitation
f. the ventricular rate is lower than the atrial rate

223. 2nd degree Mobitz I AV blockade:

a. is characterized by increasing prolongation of PQ interval
b. is characterized by constant prolongation of the PQ interval
c. is characterized by some missed QRS complexes after the previous P wave
d. is characterized by a non-constant PQ interval
e. the action of the ventricles is independent of atrial excitation
f. the ventricular rate is lower than the atrial rate

224. 2nd degree Mobitz II AV blockade:

a. is characterized by increasing prolongation of PQ interval
b. is characterized by constant prolongation of the PQ interval
c. is characterized by some missed QRS complexes after the previous P wave
d. is characterized by a non-constant PQ interval
e. the action of the ventricles is independent of atrial excitation
f. the ventricular rate is lower than the atrial rate

225. 3rd degree AV blockade:

a. is characterized by increasing prolongation of PQ interval
b. is characterized by constant prolongation of the PQ interval
c. is characterized by some missed QRS complexes after the previous P wave
d. is characterized by a non-constant PQ interval
e. the action of the ventricles is independent of atrial excitation
f. the ventricular rate is lower than the atrial rate

226. AV dissociation with ventricular tachycardia:

a. is characterized by increasing prolongation of PQ interval
b. is characterized by constant prolongation of the PQ interval
c. is characterized by some missed QRS complexes after the previous P wave
d. is characterized by a non-constant PQ interval
e. the action of the ventricles is independent of atrial excitation
f. the ventricular rate is lower than the atrial rate

227. Carotic sinus hypersensitivity

a. may present with bradycardias
b. is caused by an augmented cardioinhibitory response
c. may be triggered by carotic sinus massage
d. may be triggered by foot massage
e. may be triggered by head movement
f. may present with asystole

Heart failure

228. In heart failure:

a. the heart fails due to electrical instability
b. the cardiac output is low due to low filling pressures
c. the cardiac output to the periphery is inadequate
d. the heart does not work exclusively due to myocardial disorder
e. the heart works only thanks to compensatory mechanisms
f. the heart works adequately, but the compensatory mechanisms are failing

229. The most frequent causes of heart failure are:

a. hypertension and valvular heart diseases
b. hypertension and heart hypertrophy
c. hypertension and ischemic heart disease
d. ischemic heart disease and cardiomyopathy
e. myocardial infarction and diastolic dysfunction
f. myocardial infarction and hypovolemic shock

230. Forward failure means:

a. failure of the arterial bed
b. failure of the venous bed
c. signs and symptoms developing as a result of insufficient tissue perfusion
d. breathlessness
e. the disturbance of the skeletal muscle function (mainly fatigue)
f. failure of the left ventricular afterload

231. Heart failure is:

a. the state, shortening the life expectancy by 50%
b. the state, shortening the life expectancy to five years
c. the syndrome resulting from different cardiac diseases
d. the most frequent pathologic unit of the cardiovascular system
e. the disease, which always causes death
f. the arrest of the heart

232. In central cyanosis:

a. acral parts of the body are cold

b. upper extremities are cold; lower extremities are warm
c. lower extremities are cold; upper extremities are warm
d. extremities are cold, but mucous membranes are warm
e. the temperature of the acral parts of the body is normal
f. the amount of reduced haemoglobin in the capillary blood is more than 50%

233. The gallop rhythm means that:
a. not two but three sounds are heard during examination with a stethoscope
b. not four but five sounds are heard during examination with a stethoscope
c. the heart rate is above 100 beats per minute
d. the heart sounds mimic the gallop of a quagga (zebra)
e. the patient has „pulsus alternans"
f. all four sounds of the heart are heard during examination with a stethoscope

234. Signs of right heart failure are:
a. increased filling of the jugular veins and peripheral oedema
b. ascites and anaemia
c. hydrothorax and bronchopneumonia
d. hepatomegaly and splenomegaly
e. relative mitral insufficiency
f. dyspnoea

235. Heart failure is the state when the following states can occur:
a. altered pumping or filling function of the left ventricle
b. dysfunction of the left and right ventricle
c. isolated dysfunction of the left ventricle
d. the low filling pressure of the right ventricle
e. dysfunction of the right ventricle as a result of its insufficient filling
f. altered peripheral perfusion as a result of low filling pressure of the LV

236. The reasons for heart failure are the following:
a. ischemic heart disease and ischemia of great vessels
b. hyperthyroidism
c. constrictive pericarditis
d. adriamycin thyrotoxicosis
e. myocardial damage by liver cirrhosis
f. mitral and aortic coarctation

237. Gallop rhythm can occur in the following conditions:
a. failure of the left ventricle
b. failure of the left and right ventricle
c. young people with good elasticity of the left ventricular wall
d. significant ascites and nephrotic syndrome
e. volume overloaded heart
f. shock and hypertension

238. Compensatory mechanisms of heart failure are as follows:
a. activation of the sympathetic or parasympathetic nervous system
b. increased production of catecholamines
c. activation of angiotensin II and aldosterone production
d. Frank-Starling mechanism
e. atrial hypertrophy
f. sympathetic system activation and secondary hyperparathyroidism

239. The most frequent reasons for heart failure are:
a. ischemic heart disease
b. hypertension and ischemic heart disease
c. ischemic heart disease and myocarditis
d. hypertension
e. hypertension, ischemic heart disease and mitral stenosis
f. hypertension and valvular disorders

240. The following drugs are effective in chronic heart failure:
a. ACE-inhibitors and aldosterone receptor blockers
b. beta-blockers and calcium channel blockers
c. beta-blockers and ACE-inhibitors
d. stimulators of AT2 receptors
e. nitric oxide and prostacyclin
f. positive inotropic drugs such as amrinone, milrinone, digoxin

241. In left heart failure following conditions occur:
a. blood pressure rises in pulmonary veins
b. blood pressure rises in the left ventricle and later also in the right ventricle
c. the blood pressure in the pulmonary artery increases, and the right ventricle decreases
d. the blood pressure in the right atrium decreases, and cyanosis occurs
e. the emptying of the left ventricle decreases, and the right ventricle increases
f. the blood pressure increases in the aorta and pulmonary artery

242. Protective effects of ACE inhibitors in heart failure are the following:
a. reduction of preload, afterload and energy consumption
b. reduction of fibrosis in the myocardium
c. antiaggregatory, anticoagulative and vasodilative effects
d. improvement of the psychical state of patients

e. prevention of renal failure
f. inhibition of angiotensin-converting enzyme

243. AT1 receptor blockers are used in heart failure due to the following:
a. antiproliferative effects on heart and vessels
b. inhibition of excessive heart fibrosis
c. greater effectivity than ACE-inhibitors
d. greater effectivity than beta-blockers
e. the fact that they are the best drug for hypertension treatment
f. their protection through stimulation of AT2 receptors

244. The compensatory mechanisms of heart failure include:
a. catecholamine - mediated stimulation of contractility
b. catecholamine - mediated frequency stimulation
c. hypertrophy of the heart
d. Frank-Starling mechanism
e. tachycardia
f. bradycardia
g. dyspnoea
h. hypertension

245. Causes of heart failure include:
a. cardiomyopathy
b. ischemic heart disease
c. heart damage in ischemic heart disease
d. toxic myocardial damage *
e. coarctation of the aorta
f. myocarditis
g. hypertensive heart disease
h. mitral insufficiency

246. Heart failure is:
a. inability of the heart to ensure adequate tissue perfusion despite reduced filling pressure
b. inability of the heart to ensure adequate tissue perfusion despite normal preload
c. acute compensatory mechanisms include hypertrophy
d. chronic compensatory mechanisms include hypertrophy and catecholamines
e. tachyarrhythmias cannot cause heart failure
f. bradyarrhythmias can cause heart failure
g. caused by toxins and tamponade
h. most commonly caused by ischemic heart disease

247. Symptoms of heart failure include:
a. dyspnoea and cough are manifestations of right ventricular failure
b. hepatomegaly and increased filling of jugular veins are manifestations of right ventricular failure forward
c. fatigue, weakness, inefficiency are manifestations of left ventricular failure forward
d. syncope and renal failure are manifestations of left ventricular failure
e. hepatic failure is not a manifestation of left ventricular failure
f. oliguria and nycturia may be a manifestation of left ventricular failure
g. dyspnoea and cough are manifestations of forward ventricular failure
h. fatigue and weakness are not manifestations of left ventricle forward failure

Cor pulmonale

248. Cor pulmonale means:
a. lung damage triggered by right ventricle failure
b. lung damage triggered by left ventricle failure
c. increased pressure in the pulmonary artery
d. increased pressure in pulmonary veins
e. hypertrophy and dilation of the right ventricle triggered by lung disease
f. decompensated bronchial asthma

249. Cor pulmonale acutum is triggered mainly by:
a. massive emboli from the left ventricle
b. massive emboli from the left atrium
c. successive small embolization to the pulmonary artery
d. massive embolization to the pulmonary artery
e. massive embolization to the pulmonary vein
f. right ventricular dilation cardiomyopathy

250. In pulmonary embolism, the following is typical:
a. breathlessness, cyanosis, atrial fibrillation
b. tachycardia, chest pressure, cyanosis
c. breathlessness, tachycardia and typical chest pain
d. breathlessness, tachycardia, cyanosis
e. breathlessness, cough, haemoptysis, prolonged P wave on ECG
f. breathlessness, tachycardia, cyanosis, the presence of phlebothrombosis

251. Pathogenetic factors of pulmonary oedema are:
a. disturbed lymphatic drainage resulting in increased preload and afterload
b. hypoproteinemia and compensatory activation of the sympathetic system
c. increased permeability of arterioles and venules

d. excessive neurohumoral activation
e. hyperpermeability of capillaries
f. disturbed lymphatic drainage

252. Clinical signs of cor pulmonale include:
a. shortness of breath
b. tachycardia
c. pain behind the sternum
d. horror mortis
e. systemic hypertension
f. shock
g. cyanosis
h. hypotension

253. Cor pulmonale:
a. may be caused by thromboembolism
b. may be caused by air embolism
c. cannot be caused by fat emboli
d. may occur during an asthma attack
e. cannot occur with pneumothorax
f. may arise from embolism of the arterial bed
g. fat embolism is unlikely with polytrauma
h. cannot be caused by amniotic fluid

254. Cor pulmonale:
a. are structural or functional changes of the left heart
b. is right ventricular hypertrophy due to changes in the lungs
c. in the case of decompensation, the first is failure of the right ventricle
d. is a right ventricular failure due to increased afterload
e. are structural and functional changes in the lungs caused by heart disease
f. is a right ventricular failure due to increased preload
g. right ventricular hypertrophy is a compensatory mechanism
h. in the case of decompensation, the first is failure of the left ventricle

255. Common causes of cor pulmonale are:
a. congenital heart diseases
b. chronic obstructive pulmonary disease
c. myocardial infarction
d. interstitial lung disease
e. pulmonary fibrosis
f. pulmonary embolism
g. heart valvular disease
h. cardiomyopathy

256. Cor pulmonale:
a. right ventricular hypertrophy is a compensatory mechanism
b. cannot be caused by air embolism
c. syncope is not a possible manifestation
d. hemoptysis may be present
e. left ventricular output is not impaired
f. the symptom may be unproductive cough
g. is right ventricular hypertrophy due to pulmonary disease
h. is a congenital disease

257. Causes of cor pulmonale are:
a. pulmonary hypertension
b. chronic bronchitis
c. myocardial infarction
d. heart valvular disease
e. cystic fibrosis
f. tuberculosis
g. high altitude
h. tetralogy of Fallot

258. Cor pulmonale acutum:
a. is dilatation of the right ventricle
b. changes develop during a few hours or days
c. is hypertrophy of the right ventricle
d. can be caused by pulmonary fibrosis
e. often occurs during massive pulmonary embolisation
f. changes develop during months or years
g. can be caused by chronic obstructive pulmonary disease
h. can be fatal

259. Cor pulmonale chronicum:
a. is dilatation of the right ventricle
b. changes develop during a few hours or days
c. is hypertrophy of the right ventricle
d. can be caused by pulmonary fibrosis
e. often occurs during massive pulmonary embolisation
f. changes develop during months or years
g. can be caused by chronic obstructive pulmonary disease
h. can be caused by neuromuscular disease

260. Acute cor pulmonale:
a. a common cause is pulmonary embolism
b. the first step of compensation is right ventricle hypertrophy
c. the first step of compensation is right ventricle dilatation
d. may worsen with acute pulmonary infection
e. the afterload to the right ventricle can rise in a matter of minutes
f. the pressure in the pulmonary artery decreases
g. the pressure in the pulmonary artery raises
h. can cause right ventricle failure

261. Cor pulmonale:
a. pulmonary embolisation causes rapid fall in pulmonary artery pressure
b. prolonged pulmonary hypertension causes left ventricle hypertrophy
c. shortness of breath is a common symptom
d. prolonged pulmonary hypertension causes right ventricle hypertrophy
e. compensatory mechanism is excentric right ventricle hypertrophy
f. compensatory mechanism is concentric right ventricle hypertrophy
g. can be caused by kyphoscoliosis
h. can be caused by right ventricle failure

262. Cor pulmonale:
a. in acute cor pulmonale, the afterload to the right ventricle can rise in a matter of minutes
b. structural and functional alternation of the left ventricle (RV) caused by primary disorders of the respiratory system
c. echocardiography plays a central role in the diagnostic
d. the most common condition responsible for the acute type is pulmonary embolism
e. can be fatal
f. shortness of breath is not a symptom
g. can be caused by pulmonary fibrosis
h. hemoptysis may be present

Shock

263. Shock is characterized by:
a. hypertension and hormone mobilization
b. hypotension and loss of consciousness
c. qualms of conscience to unconsciousness
d. a collapse
e. hypotension with microcirculation disorder
f. a state with 85-90% lethality

264. The filling pressure of the left ventricle in cardiogenic shock is:
a. decreased
b. extremely decreased, resulting in hypoperfusion of the periphery
c. almost normal
d. increased
e. to speak about filling pressure in shock is a non-sense
f. lower then filling pressure of the right ventricle

265. At the beginning of the septic shock, the minute volume is:
a. decreased
b. normal or increased
c. extremely decreased
d. decreased as a result of endotoxin
e. indefinable
f. accelerated

266. The pathogenesis of shock involves the following processes:
a. neurohormonal activation and coagulation disorders
b. hypotension and unconsciousness
c. hypotension and microcirculation disturbances
d. peripheral organ hypoperfusion and sometimes intravascular coagulation
e. hypoperfusion and ischemia of peripheral organs
f. hypotension, unconsciousness, cramps and coma

267. The following factors participate in septic shock development:
a. alteration of vascular tone by bacterial toxins
b. increased capillary permeability and loss of fluid into the interstitium
c. opening of peripheral arterio-venous shunts
d. heart failure as a consequence of hyperdynamic circulation
e. peripheral oedema as a result of right heart failure
f. infection of vasoregulatory brain centres

268. The main clinical manifestations of shock are:
a. “pulsus filiformis” and unconsciousness
b. hypotension and tachycardia
c. hypotension, tachycardia and cold sweat
d. cold sweat, tachycardia, “pulsus filiformis”, hypotension (or collapse)
e. tachycardia, “pulsus filiformis”, anxiety and vomiting
f. hypotension or in hypertonics, sometimes normotension

269. Shock:
a. has a beginning, culminating and ending phase

b. is defined as the state of inadequate perfusion of tissues with increased oxygen supply to the organs
c. is a condition in which perfusion is insufficient to maintain vital functions if the condition does not normalize
d. in hypoxia of tissues, it causes alkalosis and a set of humoral and hormonal changes
e. does not lead to death at the irreversible stage with the rapid elimination of the cause
f. at the irreversible stage leads to cell necrosis
g. is manifested by a microcirculatory disorder
h. is clinically manifested as hypoperfusion with hypertension

270. Hypovolemic shock:
a. is hemorrhagic shock caused by blood loss
b. is manifested by tachycardia, hypertension, increased cardiac filling pressure and peripheral vasodilation
c. is manifested by tachycardia, hypotension, increased cardiac filling pressure and peripheral vasoconstriction
d. is manifested by tachycardia, hypotension, decreased cardiac filling pressure and peripheral vasodilation
e. manifests by tachycardia, hypotension, decreased cardiac filling pressure and peripheral vasoconstriction
f. also penetrates in case of fluid and electrolyte loss
g. may also occur in acute adrenocortical insufficiency
h. develops in dependence on the rate of blood loss

271. Distribution shock:
a. is most often caused by sepsis or endotoxemia
b. induced by hypotonics and sedatives is referred to as anaphylactoid shock
c. also includes septic shock caused by infection and inflammation
d. also includes anaphylactic shock induced by anaphylatoxins
e. also includes anaphylactoid shock caused by excessive exposure to IgE
f. is characterized by an abnormal distribution of intravascular volume
g. is referred to as a "cold" shock
h. is referred to as a "warm" shock

272. Shock:
a. in the compensatory phase, it causes the centralization of the blood circulation in the organism
b. in the compensatory phase, it causes the leaching of catecholamines in the organism
c. in the decompensated phase, it also induces vasodilation of hypoperfused tissues
d. is a sudden life-threatening illness
e. is caused by decreased cardiac output or generalized vasodilation
f. which is referred to as obstructive, occurs due to pericardial causes but not in valve disorders
g. which is termed cardiogenic is caused by primary myocardial damage
h. which is referred to as obstructive, causes a significant increase in systolic volume

Stress

273. Stress is called:
a. pathological remodelling
b. maladaptation of the organism
c. the stressor
d. the flight or negotiate reaction
e. the aggressive reaction
f. the fight or flight reaction

274. Stress can be harmful if:
a. it occurs in an unprepared organism
b. it occurs in the theatre or cinema
c. it occurs during the examination
d. it is accompanied by negative emotions
e. it occurs during sex
f. if the stress response has extraordinary intensity or duration

275. Circulation redistribution in stress means:
a. the circulation is repeatedly distributed
b. the distribution is repeatedly recirculated
c. the heart ejects the blood backwards
d. blood flows back to the heart through insufficient valves
e. blood is congested in the lower extremities
f. the brain, the heart and skeletal muscles are preferentially supplied with blood

276. A stressor is:
a. a state when the organism consumes or takes too much energy
b. circulation redistribution to skeletal muscles
c. mobilization of energy reserves
d. an activation of hormonal systems
e. an impulse that triggers a stress reaction

f. the fight or flight reaction

277. Stress is the state of an organism with the following conditions:
a. organ hypoperfusion and subsequent neurohumoral activation
b. mobilisation of metabolic and hemodynamic reserves
c. rebuilding of the circulation in order to increase muscular performance
d. metabolic rebuilding, in order to increase ATP productions in all organs
e. genetically determined disturbance of metabolism and circulation
f. increased risk of fatal dysrhythmias as a result of glucocorticoids activation

278. The roles of catecholamines in stress are:
a. vasoconstriction in striated muscles and gastrointestinal tract
b. improvement of the perfusion of brain and kidney
c. redistribution of the circulation
d. stimulation of heart performance and redistribution of the circulation
e. activation of glycogen-phosphorylase B and gluconeogenesis
f. activation of lipase and enhancement of fatty acid levels

279. The role of glucocorticoids during stress is following:
a. stimulation of glycolysis and gluconeogenesis
b. inhibition of lipolysis and fatty acid splitting
c. stabilisation of lysosomal membranes
d. stimulation of gluconeogenesis
e. preservation of sufficient serum concentration of glucose for brain energetic demands
f. minimization of ATP losses

280. Stress:
a. specific response of the organism to certain requirements imposed on the organism
b. the state the organism enters under the influence of the stressor
c. hypoglycemia cannot be a stressor
d. the type of stressor does not affect the extent of the stress response
e. the response to the stressor is also influenced by genetic factors
f. is a general adaptation syndrome
g. gradual adaptation of the organism to changed environmental conditions
h. eustress is a positive stress

281. Central processing of stressor is provided by:
a. cortex
b. hypothalamus
c. amygdala
d. sensory receptors
e. thalamus
f. chemoreceptors
g. baroreceptors
h. hippocampus

282. When stimulating the sympathetic nervous system, the following occurs:
a. peripheral vasodilation
b. increased cardiac contractility
c. lipolysis in adipose tissue
d. increased intestinal motility
e. glycogen synthesis
f. bronchodilation
g. increased sweating
h. reduced insulin secretion

283. General adaptation syndrome (stress response) can be divided into three phases: the alarm, resistance, and exhaustion phases. The characteristics of the alarm phase include the following:
a. increased mental alertness
b. elevation of blood glucose concentrations
c. conservation of salts and water, loss of K^+ and H^+
d. reduction in digestive activity and urine production
e. mobilization of glycogen and lipid reserves
f. inability to produce glucocorticoids
g. increased sweat gland secretion
h. decreases in heart and respiratory rate

Pathophysiology of the kidneys

284. The renal function includes:
a. glomerular filtration
b. glomerular resorption
c. tubular filtration
d. tubular resorption
e. haematopoiesis in the kidney
f. secretion of erythropoietin

285. Renal functions include:
a. 1-α-hydroxylase converts 25-OH-D_3 to 1,25-OH-D_3 – an active form of vitamin D
b. 1-α-hydroxylase converts 25-OH-D_3 to 1,25-OH-D_3 – a non-active form of

vitamin D
c. production of renin and prorenin
d. most of the conversion of circulating angiotensin I to angiotensin II
e. the main production of the circulating angiotensin-converting enzyme (ACE)
f. regulation of the acid-base by excretion of non-volatile anions (HCl, H_2SO_4, H_3PO_4) and re-absorption of HCO_3^-

286. Glomerular filtration:
a. is a highly selective process
b. is driven by the pressure–osmotic gradient
c. includes selective and specific transporters
d. includes sodium-glucose co-transport
e. includes sodium-proton antiport
f. includes the concentration of the urine

287. A glomerular filter:
a. distinguishes the size of the molecules
b. distinguishes the charge of the molecules – negatively charged molecules pass through easier compared to those with the positive charge
c. distinguishes the charge of the molecules – it is more difficult for negatively-charged molecules to pass through compared to those with the positive charge
d. distinguishes the shape of the molecules
e. is formed by endothelial cells, podocytes, urothel and the basal membrane
f. is negatively charged

288. Glomerular filtration:
a. its normal value is around 125 ml/min
b. its normal value is around 125 ml/h
c. can be measured by the creatinine clearance
d. can be measured by the fractional sodium excretion
e. can be measured by the paraaminohippuronate excretion
f. can be most precisely measured by the inulin clearance

289. The glomerular filtration pressure:
a. is the driving force for the tubular filtration
b. influences water re-absorption
c. is the driving force of glomerular filtration
d. is the sole factor influencing the glomerular filtration rate
e. filtration is driven by the hydrostatic capillary pressure and the osmotic capillary pressure
f. filtration is driven by the hydrostatic capillary pressure and the osmotic pressure in the Bowman capsule

290. Glomerular filtration:
a. filtration is opposed by hydrostatic pressure in the Bowman space and by the capillary osmotic pressure
b. filtration is opposed by the osmotic pressure in the Bowman space and capillary osmotic pressure
c. depends on the glomerular filtration pressure
d. depends on the glomerular filter surface
e. depends on the permeability of the glomerular filter
f. depends on ATP delivery for specific transport processes

291. Which of the following describes juxtaglomerular apparatus:
a. includes macula densa cells and extraglomerular mesangial cells
b. the production of renin is stimulated by the activation of β-receptors by the parasympathetic nervous system
c. the production of ACE is stimulated by the activation of β-receptors by the sympathetic nervous system
d. the production of renin is stimulated by the activation of β-receptors by the sympathetic nervous system
e. an increased renal flow induces renin production
f. renal ischemia stimulates renin production

292. Which of the following describes juxtaglomerular apparatus:
a. includes macula densa cells and extraglomerular mesangial cells
b. the production of renin is stimulated by the activation of β-receptors by the parasympathetic nervous system
c. the production of ACE is stimulated by the activation of β-receptors by the sympathetic nervous system
d. the production of renin is stimulated by the activation of β-receptors by the sympathetic nervous system
e. an increased sodium load in the distal tubule stimulates renin production
f. a reduced sodium load in the distal tubule stimulates renin production

293. Which of the following statement about the regulation of glomerular filtration is correct:
a. tubuloglomerular feedback: the increase in distal tubule flow leads to the humoral contraction of the afferent glomerular arteriole by macula densa
b. tubuloglomerular feedback: the increase in distal tubule flow leads to humoral dilation of the afferent glomerular arteriole by macula densa
c. an increased shear-stress in the afferent arteriole leads to myogenic constriction – protective vasoconstriction

d. an increased shear-stress in the afferent arteriole leads to myogenic dilation – protective vasodilation
e. in the case of a glomerular filter surface reduction, the glomerular filtration rate may be maintained by the increased perfusion pressure
f. in the case of a glomerular filter surface reduction, the glomerular filtration rate may be maintained by the lower perfusion pressure

294. Which of the following statement about creatinine clearance is correct:
a. (creatinine in urine/creatinine in plasma) x urine volume in 24h
b. (creatinine in plasma creatinine in urine) x urine volume in 24h
c. (creatinine in urine/creatinine in plasma) / urine volume in 24h
d. demonstrates the tubular resorption rate
e. demonstrates the glomerular filtration rate
f. demonstrates the renal perfusion flow

295. Tubular resorption:
a. is a specific process
b. includes filtration driven by the pressure-osmotic gradient
c. involves selective and specific transporters
d. includes sodium-glucose co-transport
e. includes sodium-proton antiport
f. participates in the concentration of urine

296. Which of the following statement about the fractional excretion of sodium is correct:
a. (plasmatic sodium x urine creatinine)/(urine sodium plasmatic creatinine)
b. (urine sodium plasmatic creatinine)/(plasmatic sodium x urine creatinine)
c. (urine sodium x plasmatic sodium)/(plasmatic creatinine x urine creatinine)
d. is the marker of glomerular filtration
e. is the marker of tubular resorption
f. is reduced in the acute tubular necrosis

297. In the proximal tubule:
a. processes driven by the sodium gradient (higher concentration in the epithelial cell than in the lumen) take place
b. processes driven by the sodium gradient (lower concentration in the epithelial cell than in the lumen) take place
c. the sodium-aminoacid co-transport is provided by 3 different transporter systems (for basic, acidic and neutral AA)
d. the sodium-lipid co-transport is provided by 3 different transporter systems
e. lipid re-absorption is realised on the base of pinocytosis
f. phosphates are exchanged for bicarbonate anions

298. Which of the following statement about re-absorption of HCO_3^- is correct:
a. takes part in the proximal tubule
b. takes part in the distal tubule
c. requires carbonic anhydrase for H_2CO_3 regeneration in the tubule
d. requires carbonic anhydrase for H_2CO_3 dissociation in the epithelial cell
e. H^+ necessary for the formation of H_2CO_3 in the tubule is supplied by the sodium-proton exchanger
f. H^+ necessary for the formation of H_2CO_3 in the tubule is supplied by the sodium-proton co-transport

299. Which of the following statement about re-absorption of HCO_3^- is correct:
a. HCO_3^- produced in the epithelial cell is excreted by Cl^- antiport to the interstitium
b. CO_2 (from H_2CO_3) penetrates the epithelial cell by diffusion
c. CO_2 (from H_2CO_3) penetrates the epithelial cell by a specific transporter
d. HCO_3^- produced in the epithelial cell diffuses to the interstitium
e. is compromised in renal proximal tubular acidosis
f. is compromised in renal distal tubular acidosis

300. Renal proximal tubular acidosis can be caused by:
a. the insufficient sodium-proton exchanger activity
b. the sodium-acidic aminoacids co-transporter insufficiency
c. the sodium-HCO_3^- co-transport insufficiency
d. the sodium-basic aminoacids co-transporter insufficiency
e. carbonic anhydrase inhibition
f. H^+-ATPase insufficiency

301. Renal proximal tubular acidosis:
a. can be caused by K^+/H^+-ATPase insufficiency
b. is associated with mildly acidic to alkaline urine, causing the precipitation of $CaHPO_4$ and urolithiasis
c. can be associated with normal urine pH
d. can cause metabolic alkalosis
e. can cause metabolic acidosis
f. is associated with the development of cystine stones

302. Renal distal tubular acidosis:
a. may be caused by the insufficient sodium-proton exchanger activity
b. may be caused by the sodium-acidic aminoacids co-transporter insufficiency
c. may be caused by the sodium-HCO_3^- co-transport insufficiency
d. may be caused by the sodium-basic aminoacids co-transporter insufficiency
e. may be caused by carbonic anhydrase inhibition

f. may be caused by H^+-ATPase insufficiency

303. Renal distal tubular acidosis:
a. can be caused by K^+/H^+-ATPase insufficiency
b. is associated with mildly acidic to alkaline urine, causing the precipitation of $CaHPO_4$ and urolithiasis
c. can be associated with normal urine pH
d. can cause metabolic alkalosis
e. can cause metabolic acidosis
f. is associated with the development of cystine stones

304. Hartnup syndrome:
a. is associated with mildly acidic to alkaline urine, causing the precipitation of $CaHPO_4$ and urolithiasis
b. can be caused by sodium-neutral aminoacids co-transport insufficiency
c. can be associated with neuronal and cutaneous conditions due to tryptophane deficiency
d. causes harmless loss of aminoacids
e. is associated with the development of cystine stones
f. can be caused by a sodium-basic aminoacids co-transport insufficiency

305. Cystinuria:
a. is associated with mildly acidic to alkaline urine, causing the precipitation of $CaHPO_4$ and urolithiasis
b. can be caused by sodium-neutral and dibasic aminoacids co-transport insufficiency
c. can be associated with neuronal and cutaneous conditions due to tryptophane deficiency
d. causes harmless loss of aminoacids
e. is associated with the development of cystine stones
f. can be caused by a sodium-basic aminoacids co-transport insufficiency

306. Bartter syndrome:
a. develops with the insufficient Na^+-K^+-Cl^--co-transport activity in the descendant arm
b. develops with the insufficient Na^+-K^+-Cl^--co-transport activity in the ascendant arm
c. is associated with an increased diuresis
d. is associated with an increased potassium loss
e. is associated with a reduced potassium loss
f. develops with the inhibition of sodium channels in the distal tubule

307. Bartter syndrome:
a. is the analogy to loop diuretics
b. develops in the insufficient sodium-chloride co-transport
c. is the analogy to thiazide diuretics
d. is associated with an increased sodium loss
e. is the analogy to distal potassium-sparing diuretics (aldosterone antagonists, e.g. spironolactone)
f. is the analogy to hypoaldosteronism

308. Gittelman syndrome:
a. develops with the insufficient Na^+-K^+-Cl^--co-transport activity in the ascendant arm
b. develops in the insufficient sodium-chloride co-transport
c. is the analogy to thiazide diuretics
d. is the analogy to distal potassium-sparing diuretics (aldosterone antagonists, e.g. spironolactone)
e. is associated with increased diuresis
f. is associated with an increased potassium loss

309. Hypoaldosteronism (or pseudohypoaldosteronism):
a. is associated with increased diuresis
b. is associated with an increased potassium loss
c. is associated with a reduced potassium loss
d. develops with the inhibition of sodium channels in the distal tubule
e. develops in the insufficient sodium-chloride co-transport
f. is the analogy to loop diuretics

310. Hypoaldosteronism (or pseudohypoaldosteronism):
a. is the opposite analogy to Liddle syndrome
b. develops with the insufficient Na^+-K^+-Cl^--co-transport activity in the ascendant arm
c. is the analogy to distal potassium-sparing diuretics (aldosterone antagonists, e.g. spironolactone)
d. can be caused by an insufficient K^+/H^+-ATPase activity
e. can be caused by an insufficient sodium-proton exchanger
f. can be caused by an insufficient sodium-acidic aminoacids co-transporter insufficiency

311. For the mutual interaction of the electrolyte, which statement is true:
a. hyperkalaemia promotes extracellular acidosis by potassium-proton ATPase inhibition
b. hyperkalaemia promotes alkalosis by potassium-proton ATPase inhibition

c. acidosis promotes hypokalaemia by Na^+-K^+-ATPase inhibition
d. acidosis promotes hyperkalaemia by Na^+-K^+-ATPase inhibition
e. hyperkalaemia promotes acidosis by the membrane depolarisation in the proximal tubule and Na^+-HCO_3^--co-transport from the cell inhibition

312. For the mutual interaction of electrolytes, which statement(s) is (are) true:
a. pH and plasmatic potassium concentration move in the same direction
b. pH and plasmatic potassium concentration move in the opposite direction
c. in hypocalcaemia, the re-absorption of magnesium is reduced
d. reduced levels of plasmatic calcium stimulate parathormone release leading to calcium retention and reduced retention of phosphates (not in chronic renal failure)
e. reduced levels of plasmatic calcium stimulate parathormone release leading to calcium retention; in chronic kidney failure, the increased retention of phosphate continues
f. reduced levels of plasmatic calcium stimulate parathormone release leading to calcium retention and retention of phosphates (not in chronic renal failure)

313. Nephrotic syndrome:
a. includes haematuria with erythrocyte cylinders and dysmorphic erythrocytes
b. can include oedemas
c. includes haematuria with intact erythrocytes without cylinders
d. can include proteinuria
e. includes hypoproteinemia
f. can include increased blood pressure

314. Nephrotic syndrome:
a. is the result of the loss of glomerular filter selectivity and its increased permeability
b. leads to water retention and, therefore, to the antidiuretic hormone and aldosterone release
c. leads to aldosterone release and hypokalemia, and alkalosis
d. the cause may be glomerulonephritis
e. is associated with a disrupted cholesterol metabolism
f. leads to hypocholesterolemia

315. Nephritic syndrome:
a. includes haematuria with erythrocyte cylinders and dysmorphic erythrocytes
b. can include oedemas
c. includes haematuria with intact erythrocytes
d. the cause may be glomerulonephritis
e. leads to water retention and, therefore, to the antidiuretic hormone and aldosterone release
f. can include an increased blood pressure

316. Acute renal failure:
a. is a dynamic, potentially reversible disorder of renal function
b. is characterized by the permanent loss of function due to the irreversible reduction of the functional parenchyma
c. acute from chronic is distinguished mainly by the speed of onset
d. in the anuric phase, the patient is at risk of hyperkalemia
e. in the anuric phase, the patient is at risk of hypokalemia
f. in the polyuric phase, the patient is at risk of hypokalemia

317. Acute tubular necrosis:
a. secondary - develops due to acute necrosis of tubular epithelium due to an acute renal failure
b. primary - develops due to the toxic agents
c. can be the cause of renal failure from renal and post-renal causes
d. can be detected by an increase in the sodium excretion fraction
e. can be detected be a reduced sodium excretion fraction
f. can cause tubular proteinuria and β-2-microglobulin in the urine

318. Chronic renal insufficiency:
a. is a dynamic, potentially reversible disorder of renal functions
b. is characterized by a permanent loss of function due to the irreversible reduction of the functional parenchyma
c. acute from chronic is distinguished mainly by the speed of onset
d. can be detected by an increase in the sodium excretion fraction
e. can cause tubular proteinuria and β-2-microglobulin in the urine
f. can cause tubular proteinuria and albumin in the urine

319. Which of the following statement about chronic renal insufficiency is correct:
a. can be quantified by creatinine clearance
b. leads to osteopathy due to the reduced calcium resorption and the reduced phosphates excretion
c. the associated osteopathy is due to the reduced parathormone release
d. the associated osteopathy is due to the reduced vitamin D conversion and the increased parathormone release
e. anaemia is due to bone marrow damage by osteopathy
f. anaemia si due to the reduced bone marrow stimulation by erythropoietin

320. The kidney filters:

a. urine
b. bile
c. blood
d. anything
e. cerebrospinal liquor
f. exudate

321. Kidney is:

a. non-pair visceral organ
b. the largest exocrine gland in the organism
c. the largest endocrine gland in the organism
d. paired visceral organ
e. the centre of emotions and feelings
f. the place where the food is digested

322. Urine:

a. is sweet-sour, blue-coloured fluid
b. is excreted by the kidney to the systemic circulation
c. is a tasty sparkling drink
d. is excreted by the kidney to the pulmonary circulation
e. is plasma ultra-filtrated modified by secondary processes in the tubules
f. contains large amounts of important blood elements

323. Kidneys are:

a. paired visceral organ
b. unpaired visceral organ
c. intraperitoneal organ
d. retroperitoneal organ
e. covered by a fibrous capsule
f. contain the suprarenal gland

324. Renal functions include:

a. the production of epinephrine and epinephrine in the cortex
b. the production of epinephrine and epinephrine in the medulla
c. the production of mineralocorticoids, adrenocorticosteroids and glucocorticoids in the cortex
d. the production of mineralocorticoids, adrenocorticosteroids and glucocorticoids in the medulla
e. creatinine formation
f. maintenance of fluid and electrolyte homeostasis

325. Which of the following statement about the kidney is correct:

a. is composed of the medulla and cortex
b. its functional part is constituted by folliculi
c. most glomeruli are juxtamedullar
d. the juxtamedullar glomeruli are more densely innervated
e. is innervated by the sympathetic nerve fibres
f. is innervated by the parasympathetic nerve fibres

326. Which of the following statement about the kidney is correct:

a. blood supply is provided by a. renalis
b. vas afferens enters the glomerulus
c. vas afferens leads out of the glomerulus
d. vas efferens enters the glomerulus
e. vas efferens leads out of the glomerulus
f. its innervation is both afferent and efferent

327. The nephron consists of:

a. glomerulus
b. Bowman capsule
c. proximal tubule
d. collection tubule
e. excretion tubule
f. distal tubule

328. Glomerulus consists of:

a. podocytes filling the intercapillar space
b. visceral epithelial cells
c. mesangial cells lining the inner lumen of the capillaries
d. podocytes – visceral epithelial cells
e. mesangial cells filling the intercapillary space
f. endothelial cells

329. Which of the following statement about glomerulus is correct:

a. consists of parietal epithelial cells – podocytes
b. the blood flow is regulated by the contraction/relaxation of the mesangial cells
c. consists of parietal epithelial cells lining out the inner of the Bowman capsule
d. TXA_2, leukotrienes, PAF, and norepinephrine influence the glomerular filtration via mesangial cells
e. the surface of visceral epithelial cells is negatively charged

330. Glomerulus:
a. is the major organ of vision
b. its main function is glomerular filtration
c. its main function is tubular excretion
d. its main function is tubular resorption
e. as a part of the nephron, it is the main functional unit of the kidney
f. helps to keep lateral balance

331. The proximal tubule:
a. is covered by simple squamous epithelium
b. is covered by stratified squamous epithelium
c. is covered by cuboid epithelium
d. resorbs proteins
e. resorbs lipids
f. resorbs glucose

332. The proximal tubule:
a. is the site of aldosterone-regulated Na^+ and K^+ exchange
b. is the site of Na^+ K^+ $2Cl^-$ cotransport
c. is the site of HCO_3^- resorbtion (via carboanhydrase)
d. is the site of direct proton excretion (via H^+ ATPase)
e. is water permeable
f. produces renin

333. Distal tubule:
a. is covered by simple squamous epithelium
b. is covered by stratified squamous epithelium
c. is covered by cuboid epithelium
d. resorbs proteins
e. resorbs lipids
f. resorbs glucose

334. Distal tubule:
a. is the site of aldosterone-regulated Na+ and K+ exchange
b. is the site of Na+ K+ 2Cl- cotransport
c. is the site of HCO3- resorbtion (via carboanhydrase)
d. is the site of direct proton excretion (via H+ ATPase)
e. is water permeable
f. produces renin

335. Loop of Henle:
a. is covered by stratified squamous epithelium
b. is covered by urothel
c. is covered by erothel
d. resorbs proteins
e. resorbs lipids
f. resorbs glucose

336. Loop of Henle:
a. is the site of aldosterone-regulated Na+ and K+ exchange
b. is the site of Na+ K+ 2Cl- cotransport
c. is the site of HCO3- resorbtion (via carboanhydrase)
d. is the site of direct proton excretion (via H+ ATPase)
e. is water permeable
f. produces renin

337. Erythropoietin:
a. is produced in the juxtaglomerular apparatus by juxtamedullar granular cells
b. is produced in the interstitium by type 1 cells
c. is produced by the cells of the proximal tubule
d. stimulates the bone marrow to the production of myeloid cells
e. stimulates the bone marrow to the production of erythroid cells
f. stimulates the bone marrow to the production of lymphoid cells

338. Thrombopoietin:
a. is produced in the juxtaglomerular apparatus by juxtamedullar granular cells
b. is produced in the interstitium by type 1 cells
c. is produced by the cells of the proximal tubule
d. stimulates the bone marrow to the production of myeloid cells
e. stimulates the bone marrow to the production of erythroid cells
f. stimulates the bone marrow to the production of lymphoid cells

339. Which of the following describes renal capillaries:
a. are arranged in two parallel vascular beds
b. are arranged in two serial vascular beds
c. glomerular capillary bed is exposed to high pressures
d. peritubular capillary bed is exposed to high pressures
e. glomerular capillary bed is exposed to low pressures
f. peritubular capillary bed is exposed to low pressures

340. Which of the following describes renal capillaries:
a. the major pressure difference and major flow regulation are at the level of the renal artery
b. the major pressure difference and major flow regulation are at the level of

the vas afferens
c. the major pressure difference and major flow regulation are at the level of the vas efferens
d. the major pressure difference and major flow regulation are at the level of the peritubular sphincters
e. major blood flow is diverted to the juxtamedullar glomeruli
f. major blood flow is diverted to the cortical glomeruli

341. Which of the following describes renal capillaries:
a. cortical blood flow is more sensitive to the changes in the systemic arterial pressure
b. juxtamedullar blood flow is more sensitive to the changes in the systemic arterial pressure
c. juxtamedullar blood flow is relatively stable
d. blood pressure fall and hypotension compromise preferentially the juxtamedullar blood flow
e. blood pressure fall and hypotension compromise preferentially the cortical blood flow
f. inflammatory alteration compromise preferentially the juxtamedullar blood flow

342. Renin release is stimulated by the activation of:
a. the chemoreceptors in the vas afferens by increased sodium load
b. the chemoreceptors in the distal tubule by increased sodium load
c. the baroreceptors in the vas afferens by increased blood pressure
d. the baroreceptors in the vas afferens by reduced blood pressure
e. the chemoreceptors in the distal tubule by reduced sodium load
f. the chemoreceptors in the vas afferens by reduced sodium load

343. Renin directly or indirectly:
a. constricts preferentially the vas afferens
b. constricts preferentially the vas efferens
c. increases the glomerular filtration
d. reduces sodium load in the distal tubule
e. increases sodium resorption in the distal tubule
f. increases the peritubular flow

344. Renin:
a. has no known function
b. regulates gastric acid secretion
c. is produced in the kidney
d. is produced in the suprarenal glands
e. dilates the pupil
f. contracts the pupil

345. Regulation of the renal blood flow:
a. sufficient prostaglandin and prostacyclin (E_2, I_2, D_2) production is essential for the maintenance of renal blood flow
b. angiotensin II increases glomerular filtration
c. angiotensin II reduces glomerular filtration
d. adrenergic agonists substantially increase the glomerular filtration
e. adrenergic agonists substantially reduce the glomerular filtration
f. adrenergic agonists do not substantially alter the glomerular filtration

346. Plasma ultra-filtrate (primary urine):
a. contains protein traces
b. contains low-molar non-electrolyte substances (urea, glucose, amino acids) in a similar concentration as plasma
c. contains low-molar non-electrolyte substances (urea, glucose, amino acids) in higher concentration compared to plasma
d. contains traces of low-molar non-electrolyte substances (urea, glucose, amino acids)
e. does not contain positively charged ions
f. does not contain negatively charged ions

347. Tubular sodium resorbtion:
a. is realized in the proximal tubule
b. is realized in the distal tubule
c. its gradient is used for the transport of other molecules (glucose, amino acids, lactate, phosphate)
d. is powered by the gradient of other molecules (glucose, amino acids, lactate, phosphate)
e. in the proximal tubule, sodium is exchanged for potassium
f. in the distal tubule, sodium is exchanged for potassium

348. Tubular potassium resorption:
a. its rate in the proximal tubule is minimal
b. its absorption in the proximal tubule is almost complete
c. the traces of potassium are resorbed in the distal tubule
d. potassium is excreted into the urine in the distal tubule
e. is driven by the difference in the filtration pressures
f. is regulated by histamine release from the macula densa

349. Aldosterone:

a. stimulates potassium excretion and sodium resorption in the proximal tubule
b. stimulates sodium excretion and potassium resorption in the proximal tubule
c. in the distal tubule stimulates potassium excretion and sodium resorption
d. stimulates sodium excretion and potassium resorption in the distal tubule
e. does not modulate the tubular functions in the kidney, only the glomerular filtration
f. is produced in the juxtaglomerular apparatus

350. Preglomerular proteinuria:

a. is caused by glomerular filter damage
b. is caused by the presence of atypical proteins (myoglobin, Bence-Jones protein) in the plasma
c. is caused by insufficient protein resorption from the primary urine
d. is characterized by the presence of mainly low-molecular-weight proteins (b_2-microglobulin)
e. is characterized by the presence of inflammatory proteins
f. is characterized by the presence of mainly albumin and, at later stages, also immunoglobulins in the urine

351. Glomerular proteinuria:

a. is caused by glomerular filter damage
b. is caused by the presence of atypical proteins (myoglobin, Bence-Jones protein) in the plasma
c. is caused by insufficient protein resorption from the primary urine
d. is characterized by the presence of mainly low-molecular-weight proteins (b2-microglobulin)
e. is characterized by the presence of inflammatory proteins
f. is characterized by the presence of mainly albumin and, at later stages, also immunoglobulins in the urine

352. Tubular proteinuria:

a. is caused by the secretion of inflammatory proteins from the inflamed interstitium
b. is caused by the presence of atypical proteins (myoglobin, Bence-Jones protein) in the plasma
c. is caused by insufficient protein resorption from the primary urine
d. is characterized by the presence of mainly low-molecular-weight proteins (b2-microglobulin)
e. is characterized by the presence of inflammatory proteins
f. is characterized by the presence of mainly albumin and, at later stages, also immunoglobulins in the urine

353. Postglomerular proteinuria is:

a. caused by secretion of inflammatory proteins from the inflamed interstitium
b. caused by the presence of atypical proteins (myoglobin, Bence-Jones protein) in the plasma
c. caused by insufficient protein resorption from the primary urine
d. characterized by the presence of mainly low-molecular-weight proteins (b2-microglobulin)
e. characterized by the presence of inflammatory proteins
f. characterized by the presence of mainly albumin and at later stages also, immunoglobulins in the urine

354. Renal failure:

a. does not affect the renal excretory capacity
b. represents an end-stage disease characterized by the inability of the kidney to produce sufficient amounts of cortisol
c. can lead to portal hypertension
d. is associated with massive amounts of myoglobin in the urine
e. as long as the liver can compensate for the reduced excretion of waste product, it does not constitute a danger to the patient
f. is often neurogenic

Pathophysiology of the respiratory system

355. The ventilation of the lungs means:

a. an intake of air to the lungs
b. an exhale of air deprived of O_2 and enriched with CO_2
c. the principle of distension and compression of the lungs
d. during ventilation, the compression of the lungs is not present
e. absence of the distension of the lungs during ventilation
f. absence of the distension and compression of the lungs during ventilation is not present

356. Which of the following statement about alveolar ventilation is correct:

a. is effective when blood saturation is among 93-100%
b. is not the physiological breathing parameter
c. the partial pressure of CO_2 is 35-45 mmHg
d. the partial pressure of O_2 is 75-100 mmHg
e. is effective when blood saturation is below 80%
f. is effective when blood saturation is below 92%

g. during effective ventilation, physiological plasma pH is 7.36-7.44

357. Which of the following statement about alveolar ventilation is correct:
a. is effective when blood saturation is more than 93%
b. is a physiological breathing parameter
c. the partial pressure of CO_2 is below 35 mmHg
d. the partial pressure of O_2 is below 75 mmHg
e. is effective when blood saturation is below 93-100%
f. is effective when blood saturation is below 92%
g. during effective ventilation, physiological plasma pH is 7.20-7.60

358. During hyperventilation:
a. the amount of CO_2 in arterial blood is decreasing
b. the plasmatic concentration of H_2CO_3 is decreasing
c. the concentration of H^+ is increasing
d. the concentration of H^+ is decreasing
e. the concentration of H^+ is in a normal range
f. respiratory alkalosis occurs

359. During hyperventilation:
a. the plasmatic level of ionized Ca decreases
b. the plasmatic level of ionized Ca increases
c. the bounding of Ca to proteins is stronger
d. the bounding of Ca to proteins is weaker
e. neuro-muscular irritability is increased
f. neuro-muscular irritability is decreased

360. Hyperventilation:
a. leads to respiratory alkalosis
b. is compensated by eliminating bicarbonates in kidneys
c. is compensated by retention of H+ and non-bicarbonates ions in kidneys
d. can lead to tetany
e. never leads to tetany
f. can cause muscle twitching

361. Clinical causes of hyperventilation include:
a. extreme emotions
b. high temperature
c. encephalitis
d. salicylates
e. brain tumours
f. the trauma of CNS

362. During hypoventilation:
a. the concentration of CO_2 in arterial blood increases
b. the concentration of CO_2 in arterial blood decreases
c. decreased concentration of CO_2 leads to vasodilatation
d. increased concentration of CO_2 leads to vasodilatation
e. the concentration of CO_2 is in the normal range
f. the oedema of CNS can occur

363. Hypoventilation:
a. leads to the increased concentration of H^+ in ECT
b. leads to the potassium deficit in plasma
c. can lead to cor pumonale chronicum development
d. can be caused by disturbances of breathing regulation
e. is accompanied by hypercapnia and hypoxemia
f. leads to respiratory alkalosis
g. leads to respiratory acidosis

364. Clinical causes of hypoventilation can be:
a. obstructive lung diseases
b. restrictive lung diseases
c. a deficit of surfactant
d. anaesthetics
e. hypnotics
f. sedatives
g. an intake of pure oxygen

365. Clinical causes of hyperventilation can be:
a. obstructive lung diseases
b. restrictive lung diseases
c. a deficit of surfactant
d. anaesthetics
e. hypnotics
f. sedatives

366. Which of the following statement about ventilation disturbance is correct:
a. is characterized by disturbances of breathing gases exchange between the outer environment and alveolar air
b. exchange of breathing gases between the external environment and alveolar space is physiological
c. a clinical sign is lower ventilation
d. does not have clinical symptoms
e. the vital capacity is normal

367. In restrictive ventilation disorder:

a. the volume of the lungs is reduced
b. the lung volume is physiological
c. the vital capacity is normal
d. the vital capacity is increased
e. the vital capacity is decreased
f. the rigidity of pulmonary parenchyma can be the cause

368. The causes of restrictive ventilation disorder can be:

a. disorders of thorax and breathing muscles
b. fibrosis of lungs
c. the disease of pleura
d. the reduction of thorax cavity
e. tumours
f. pleural effusion

369. The obstructive ventilation disorder is characterized by the following statement:

a. the resistance in airways is increasing
b. the resistance in airways is decreasing
c. asthma bronchiale can be the cause
d. chronic bronchitis can be the cause
e. pulmonary emphysema can be the cause

370. Diffusion means:

a. the movement of molecules from the area with a higher concentration to the area of a lower concentration
b. the active movement of molecules from the area with a higher concentration to the area of a lower concentration
c. CO_2 in airways diffuses in the same direction as oxygen
d. a passive movement
e. diffusion of O_2 is on the level of alveolar spaces and capillaries
f. diffusion of O_2 is also on the level of capillaries and tissue cells
g. diffusion of O_2 is not on the level of capillaries and tissue cells

371. Diffusion of breathing gases:

a. depends on the condition of each layer of the alveolar-capillary membrane
b. depends on the size of the diffuse area and its thickness
c. depends on the speed of the chemical reaction between gas and haemoglobin
d. does not take place on the alveolar membrane
e. the size of the diffuse area is not important for the diffusion
f. it does not depend on the speed of the chemical reaction between the gas and haemoglobin

372. Perfusion is characterized by the following statement:

a. is important for the exchange of breathing gases in the lungs
b. the flow of blood through the lungs is always uniformly distributed
c. the ventilation of the lungs is in relation to its perfusion
d. the pulmonary bloodstream is important for the diffusion of O_2
e. the blood flow through the lungs is not uniformly distributed
f. the ventilation of the lungs is not related to its perfusion

373. Ventilation – perfusion mismatch:

a. leads to the disorder of the exchange of breathing gases in the pulmonary bloodstream
b. is a misbalance between blood oxygen saturation and the elimination of CO_2 at the level of alveolar-capillary membranes
c. can cause changes in the alveolar-capillary membrane
d. can be caused by changed affinity of haemoglobin to O_2
e. is a balance between blood oxygen saturation and the elimination of CO_2 at the level of alveolar-capillary membranes

374. The following factors belong to the causes of perfusion disorders:

a. decreased ventilation of certain areas of the lungs
b. alveolar hypoxia
c. vasculitis
d. pulmonary embolism
e. emphysema
f. the compression of a larger vessel, e.g. by a tumour

375. The following statement about ventilation-perfusional abnormalities is correct:

a. the alveolus is ventilated, but the blood flow is reduced
b. the alveolus is not ventilated, but perfusion is maintained
c. alveolus and capillaries are functional
d. ventilation and perfusion are in misbalance during physiological conditions
e. the alveolus is ventilated, but the blood flow is not present
f. alveolus and capillaries are dysfunctional

376. During COPD:

a. expirium is limited
b. expirium is prolonged
c. expirium is faster
d. expirium is physiological

e. inspirium is prolonged
f. chronic bronchitis is the common cause

377. COPD is characterized by:
a. the structural changes of airways
b. loss of lung elasticity
c. limited expirium
d. limited inspirium
e. an increased rate of expiration
f. an increased vital capacity

378. Symptoms during COPD include:
a. emphysema on X-rays of the thorax
b. orthopnoea
c. prolonged expirium
d. prolonged inspirium
e. dyspnoea
f. signs of hypoxia
g. cor pulmonale chronicum

379. The following statement about respiratory insufficiency is correct:
a. it is the disturbance of breathing gases exchange between alveolar space and pulmonary capillaries
b. pCO_2 is above physiological value
c. pO_2 is below physiological value
d. the exchange of breathing gases between alveolar space and pulmonary capillaries is physiological
e. pCO_2 is below physiological value
f. pO_2 is above physiological value

380. The causes of acute respiratory insufficiency can be:
a. acute intoxication of CNS
b. acute pneumothorax
c. inhaling a foreign body
d. acute bronchiolitis
e. pneumonia
f. ARDS

381. The shift of the dissociation curve of haemoglobin into the right can be caused by:
a. polyglobulia
b. hypoviscosity of blood
c. pulmonary hypertension
d. cor pulmonale chronicum
e. aerobic metabolism
f. lactate alkalosis

382. Acute Respiratory Distress Syndrome is characterized by:
a. the destruction of the pulmonary capillary endothelium
b. the interstitial and alveolar oedema
c. alveolar oedema only
d. the escape of proteins into interstitial and alveolar space
e. the activation of neutrophils
f. the destruction of type II pneumocytes

383. Signs of Acute Respiratory Distress Syndrome are:
a. $PaO_2 < 6,7$ kPa when breathing air with 60% concentration of O_2
b. hypoxemia
c. tachypnoea
d. bradypnoe
e. cyanosis
f. pulmonary hypertension

384. What can occur during Acute Respiratory Distress Syndrome?
a. hypercapnia
b. hypoperfusion
c. acidosis
d. organ failure
e. hypocapnia
f. alkalosis

385. The pulmonary causes of chronic respiratory insufficiency are:
a. chronic obstruction of the upper respiratory tract
b. the diseases of bronchi
c. chronic bronchitis
d. the diseases of pulmonary parenchyma
e. interstitial pulmonary fibrosis
f. the pulmonary emphysema
g. left heart insufficiency
h. the chronic diseases of pleura

386. The non-pulmonary causes of chronic respiratory insufficiency are:
a. injury of CNS by drugs
b. injury of CNS by infection

c. injury of CNS by trauma
d. injury of the peripheral nervous system
e. myasthenia gravis
f. endocrine diseases (myxedema)
g. injury of the thorax
h. obesity

387. Pathophysiological signs of hypoxemia are:
a. alveolar hypoventilation
b. alveolar hyperventilation
c. the abnormalities of diffusion
d. ventilation-perfusion abnormalities
e. the right-left shunt can cause hypoxia
f. the left-right shunt can cause hypoxia

388. Pathophysiological signs of hypoxemia are:
a. alveolar hyperventilation
b. alveolar hypoventilation
c. the abnormalities of perfusion
d. ventilation-perfusion abnormalities
e. the right-left shunt can cause hypoxia
f. the left-right shunt can cause hypoxia
g. congenital heart diseases can cause hypoxia
h. coronary heart disease can cause hypoxia

389. Chronic hypoxia leads to adaptation mechanisms, which include:
a. the elevation of 2,3- bisphosphoglycerate in erythrocytes
b. the elevation of 2,3- bisphosphoglycerate in leukocytes
c. the elevation of 2,3- bisphosphoglycerate in thrombocytes
d. the elevation of 2,3- bisphosphoglycerate in neutrophils
e. depletion of 2,3- bisphosphoglycerate in neutrophils
f. depletion of 2,3- bisphosphoglycerate in erythrocytes
g. the shift of the dissociation curve of haemoglobin to the right
h. the shift of the dissociation curve of haemoglobin to the left

390. Chronic hypoxia leads to adaptation mechanisms, which include:
a. the elevation of 2,3- bisphosphoglycerate in erythrocytes
b. the elevation of 2,3- bisphosphoglycerate in leukocytes
c. the elevation of 2,3- bisphosphoglycerate in thrombocytes
d. the elevation of 2,3- bisphosphoglycerate in neutrophils
e. the shift of the dissociation curve of haemoglobin to the right
f. the shift of the dissociation curve of haemoglobin to the left
g. polyglobulia
h. the rise of haematocrit

391. Chronic hypoxia leads to adaptation mechanisms, which include:
a. the elevation of 2,3- bisphosphoglycerate in erythrocytes
b. the elevation of 2,3- bisphosphoglycerate in neutrophils
c. the shift of the dissociation curve of haemoglobin to the right
d. polyglobulia
e. the rise of haematocrit
f. elevated concentration of haemoglobin in erythrocytes
g. the elevation of 2,3- bisphosphoglycerate in thrombocytes
h. the shift of the dissociation curve of haemoglobin to the left

392. Pulmonary hypertension results in:
a. overload of right heart
b. overload of left heart
c. hypertrophy of the left heart
d. hypertrophy of the right heart
e. cor pulmonale
f. hypoxia of the right heart
g. hypoxia of the left heart
h. lactate acidosis

393. The causes of restriction ventilation abnormalities are:
a. pulmonary fibrosis
b. pulmonary congestion
c. atelectasis
d. the states after pulmonary resection
e. pleural adhesion
f. kyphoscoliosis
g. neuromuscular abnormalities
h. the trauma of the thorax

394. The causes of restriction ventilation abnormalities are:
a. pulmonary fibrosis
b. pulmonary congestion
c. atelectasis
d. paresis of nervus phrenicus
e. paresis of nervus trigeminus
f. ascites and obesity
g. peritonitis
h. abdominal surgery

395. The causes of obstruction ventilation abnormalities are:

a. pulmonary fibrosis
b. pulmonary congestion
c. atelectasis
d. paresis of nervus phrenicus
e. asthma bronchiale
f. chronic bronchitis
g. bronchiolitis
h. emphysema pulmonum

396. The causes of obstruction ventilation abnormalities are:

a. asthma bronchiale
b. chronic bronchitis
c. bronchiolitis
d. emphysema pulmonum
e. paresis of nervus trigeminus
f. ascites and obesity
g. peritonitis
h. abdominal surgery

397. Asthma bronchiale:

a. is the inflammatory disease of the lungs
b. is characterized by hyperreactivity of the tracheobronchial tree
c. is not the inflammatory disease of the lungs
d. is characterized by hyporeactivity of the tracheobronchial tree
e. is characterized by hyperreactivity of the respiratory tract
f. is characterized by hyporeactivity of the respiratory tract
g. is characterized by contraction of bronchial smooth muscle
h. is characterized by oedema of bronchial mucose

398. Asthma bronchiale is characterized by:

a. the contraction of bronchial smooth muscle
b. the oedema of bronchial mucose
c. the oedema of gastric smooth muscle
d. hypersecretion of mucin
e. hyposecretion of mucin
f. the contraction of bronchial striated muscle
g. the hyperreactivity of the tracheobronchial tree
h. the reversible obstruction of little respiratory pathways

399. Which of the following characteristics does asthmatic attack describe:

a. can appear during the day as well as at night
b. can have prodromal signs
c. is characterized by prolonged expirium
d. is caused by immune hyperreaction
e. is characterized by bronchospasm
f. is caused by the oedema of bronchial mucose

400. Pulmonary emphysema:

a. is characterized by the expansion of spaces below terminal bronchi
b. is characterized by the reduction of spaces below terminal bronchi
c. is characterized by the expansion of spaces upper terminal bronchi
d. is characterized by the reduction of spaces upper terminal bronchi
e. belongs to the chronic obstruction lungs diseases
f. it does not belong to the chronic obstructive lungs diseases
g. genetic factors can play a role in the etiopathogenesis
h. smoking can play a role in the etiopathogenesis

401. Pneumonia:

a. is an acute inflammatory disease of pulmonary parenchyma
b. is characterized by alveoli filled with fibrin exudate
c. can have a stadium of blood congestion
d. can have a stadium of red hepatization
e. can have a stadium of grey hepatization
f. can have a stadium of resolution
g. is not an acute inflammatory disease
h. is an acute inflammatory disease

402. Pulmonary abscess:

a. is a cavity created by necrosis of pulmonary parenchyma
b. is not a cavity filled with pus
c. can be of primary origin in healthy pulmonary parenchyma
d. can be of secondary origin
e. can be solitary
f. can be created by haematogenic dissemination
g. is not a severe state
h. can be created by bronchogenic dissemination

403. Pneumothorax:

a. is the presence of the air in the pleural cavity
b. can be spontaneous
c. can be idiopathic
d. can be symptomatic
e. can be iatrogenic

f. can be therapeutic
g. can be diagnostic
h. can be caused by the injury of the thorax

404. Pneumothorax:
a. is the presence of the air in the peritoneal cavity
b. can be spontaneous
c. can not be idiopathic
d. can be symptomatic
e. can not be iatrogenic
f. can be therapeutic
g. can not be diagnostic
h. can be caused by the injury of the thorax

405. Acute respiratory distress syndrome is characterized:
a. by the destruction of the pulmonary capillary endothelium
b. by the oedema of interstitium as well as alveoli
c. only by interstitial oedema
d. by the escape of proteins into the capillary stream
e. by the activation of thrombocytes
f. by the destruction of pneumocytes of the 1st type
g. by the destruction of erythrocytes

406. Which of the following describes acute respiratory insufficiency:
a. hypoxemia is present
b. central cyanosis is present
c. peripheral cyanosis is present
d. hypercapnia is present
e. decrease of pH below 7.2 causes disturbances in consciousness
f. decrease of pH below 7.1 causes unconsciousness
g. decrease of pH below 7.5 causes disturbances in consciousness
h. decrease of pH below 7.3 causes unconsciousness

407. Which of the following describes acute respiratory insufficiency:
a. central cyanosis is present
b. peripheral cyanosis is present
c. hypercapnia is present
d. decrease of pH below 7.4 causes disturbances in consciousness
e. decrease of pH below 7.1 causes unconsciousness
f. decrease of pH below 7.5 causes disturbances in consciousness
g. decrease of pH below 7.3 causes unconsciousness
h. hypoxemia is present

408. In pulmonary hypertension:
a. medium pressure in the pulmonary artery is above 20 mmHg
b. medium pressure in the pulmonary artery is not above 20 mmHg
c. medium pressure in the pulmonary artery is above 10 mmHg
d. medium pressure in the pulmonary artery is not above 10 mmHg
e. medium pressure in the pulmonary artery is above 2.7 kPa
f. medium pressure in the pulmonary artery is not above 2.7 kPa
g. medium pressure in the pulmonary artery is above 100 mmHg
h. medium pressure in the pulmonary artery is not above 100 mmHg

409. Pneumonia:
a. is a chronic inflammatory lung disease
b. alveoli are filled with fibrinous exudate
c. is not characterized by a stage of the blood congestion
d. is not characterized by stage of grey hepatization
e. is not characterized by a stage of red hepatization
f. does not have a stadium of the resolution
g. is an acute inflammatory disease
h. is not an acute inflammatory disease

410. Which of the following describes respiratory insufficiency:
a. is the result of respiratory dysfunction of the lungs
b. pO2 is decreased
c. pCO2 can be increased
d. pCO2 can not be increased
e. is not the result of respiratory dysfunction of the lungs
f. the tension of oxygen is increased
g. the tension of carbon dioxide is decreased
h. the retention of carbon dioxide does not occur

411. Pleuritis can be divided according to the character as:
a. pleuritis sicca
b. pleuritis cardiaca
c. pleuritis exsudativa
d. pleuritis haemorrhagica
e. pleuritis tumorosa
f. pleuritis pneumonia
g. empyema thoracis
h. empyema cardiaca

412. Pleuritis can be divided according to the exudate as:
a. pleuritis serosa

b. pleuritis cardiaca
c. pleuritis serofibrinosa
d. pleuritis haemorrhagica
e. pleuritis purulenta
f. pleuritis putrida
g. empyema thoracis
h. empyema cardiaca

413. Chronic obstruction lungs disease is:
a. chronic bronchitis
b. pneumonia
c. asthma bronchiale
d. pulmonary emphysema
e. laryngitis
f. tracheitis
g. inflammation of the paranasal cavity
h. pulmonary hypertension

414. The aetiology of pulmonary emphysema can be caused:
a. genetically
b. by alfa1-antitrypsin deficiency
c. by a deficit of cholinesterases
d. by chronic infections of the respiratory tract
e. by smoking
f. by the insufficiency of movement
g. can not be caused genetically
h. by alfa3- antitrypsin deficiency

Pathophysiology of the gastrointestinal system

415. Which of the following describes gastroesophageal reflux disease:
a. is present if the motility of the upper part of the gastrointestinal tract is impaired
b. is the consequence of rapid stomach emptying
c. is caused by an impaired antireflux mechanism
d. usually does not cause oesophagal erosions or ulcerations
e. pain occurs just 4 hours after the meal
f. gastric and duodenal content is moving to the oesophagus
g. can cause aspiration pneumonitis or Barrett's oesophagus

416. Which of the following describes gastroesophageal reflux:
a. gastric content is moving to the oesophagus
b. is never present in healthy subjects
c. the antireflux barrier is formed by the upper oesophagal sphincter
d. primary contractions during reflux move the regurgitated material back to the stomach
e. during reflux, the acidic material in the oesophagus is neutralized by saliva
f. can cause esophagitis and oesophagal bleeding

417. Which of the following statement about dysphagia is correct:
a. oesophagal dysphagia is present in peptic oesophagal strictures
b. it is impaired deglutition
c. it is caused by weak oesophagal motility or oesophagal obstruction
d. oesophagal dysphagia is present in tonsillitis and Parkinson's disease
e. it is a backward shifting of the regurgitated material
f. oropharyngeal dysphagia is present in sclerosis multiplex

418. Which of the following statement about motor impairments of the oesophagus is correct:
a. oesophagal hypomotility is the failure of oesophagal contractility
b. gastroesophageal reflux is a sign of the oesophagal hypermotility
c. dysphagia or chest pain are symptoms of the oesophagal hypermotility
d. oesophagal achalasia is the inability of oesophagal contraction
e. signs of oesophagal scleroderma include gastroesophageal reflux
f. first symptoms of the oesophagal achalasia include chest pain irradiating to the back

419. Gastric acid secretion:
a. is inhibited by prostaglandin E2
b. is stimulated by histamine
c. is stimulated by somatostatin
d. is inhibited by gastrin
e. is stimulated by acetylcholine
f. is inhibited by food intake

420. Which of the following describes gastric mucosa:
a. it is protected by mucus
b. it is irritated by prostaglandin E2
c. the mucus protects the gastric mucosa from pepsin
d. it is protected by pepsin
e. prostaglandins stimulate the production of mucus and bicarbonates
f. prostaglandins stimulate the gastric acid production
g. bicarbonates protect the gastric mucosa from autodigestion
h. the H^+ concentration in the mucus film increases towards the mucosa

421. Which of the following describes gastritis:

a. can be caused by Helicobacter pylori infection
b. the causes of acute gastritis do not include alcohol or non-steroidal anti-inflammatory drugs
c. atrophic gastritis induces the insufficiency of intrinsic factor
d. Cushing ulcer is the consequence of severe burns
e. Helicobacter pylori infection may cause intestinal metaplasia
f. autoimmune gastritis induces the excess of intrinsic factors and consequently the formation of pernicious anaemia
g. gastritis may be caused by cytomegalovirus or candida
h. Cushing ulcer is formed after trauma or surgical procedure

422. Which of the following describes a peptic ulcer:

a. in the duodenal ulcer, the stomach emptying is delayed
b. mucosal ischemia with subsequent impairment induced by gastric acid is the cause of stress ulcers
c. in duodenal ulcer, the epigastric pain arises immediately after the meal
d. in the gastric ulcer, the stomach emptying is delayed
e. Helicobacter pylori infection is often present in duodenal ulcers
f. in gastric ulcers, the gastric secretion is usually increased
g. in Zollinger-Ellison syndrome, the gastrin secretion is increased by pancreatic tumour cells
h. in gastric ulcers, the pain is relieved by food

423. Which of the following describes a peptic ulcer:

a. can be present in the oesophagus
b. Helicobacter pylori is an irritating factor
c. does not extend into submucosa
d. in duodenal ulcers, the gastric secretion is decreased
e. Helicobacter pylori infection is always linked to the peptic ulcer development
f. in gastric ulcers, the mucosal barrier is damaged
g. gastric ulcer is most frequently localized in the subcardial area
h. urease production is important in the pathogenesis and diagnosis of Helicobacter pylori infection

424. Which of the following statements about hepatic cirrhosis is correct:

a. primary biliary cirrhosis is caused by the excessive production of antimitochondrial antibodies
b. is caused by hepatitis virus A infection
c. hepatocytes succumb to degenerative changes and necrosis
d. causes portal hypotension
e. jaundice, spider naevi and haemorrhages are clinical symptoms
f. biliary cirrhosis is the consequence of a decreased bile production
g. the causes include alcohol abuse
h. complications are hepatic failure or hepatocellular carcinoma

425. Which of the following statements about hepatic insufficiency is correct:

a. hepatitis can lead to an acute hepatic insufficiency
b. clinical symptoms do not include jaundice or haemorrhages
c. in acute hepatic insufficiency, hepatic functions are slowly and gradually deteriorated, leading to hepatic coma
d. a chronic hepatic insufficiency is often a consequence of hepatic cirrhosis
e. hepatic function is sufficient in hepatic failure
f. an acute hepatic insufficiency leads to progressive loss of liver tissue and can reduce its weight

426. Which of the following describes portal hypertension:

a. the blood pressure in vena portae increases over 8 mmHg
b. in the presinusoid area, it is caused by the right heart failure
c. mechanical resistance in the liver decreases
d. oesophagal and gastric varices and haemorrhoids develop
e. in the sinusoid area, it is caused by hepatic cirrhosis
f. an increased portal blood flow and hyperdynamic circulation contribute to its development
g. collateral circulation is collapsed
h. in the presinusoid area, it is caused by portal vein thrombosis

427. Which of the following describes ascites:

a. is the presence of an excessive amount of fluid in the lower extremities or the sacral area
b. as a consequence of portal vasodilation in the hepatic cirrhosis with portal hypertension, the renin-angiotensin-aldosterone system is activated, leading to sodium and water reabsorption
c. leads to increased vital lung capacity
d. is the consequence of decreased hydrostatic pressure and increased oncotic pressure
e. is the presence of transudate in the peritoneal cavity
f. as a consequence of vasopressin activation in the hepatic cirrhosis with portal hypertension, the plasmatic volume decreases
g. ascites can lead to bacterial peritonitis
h. hyperalbuminemia contributes to ascites development

428. Which of the following describes jaundice:

a. extrahepatic cholestasis can cause intrahepatic jaundice
b. increased bilirubin conjugation causes jaundice
c. posthepatic jaundice develops due to increased hemolysis
d. stress and fasting in Gilbert's syndrome increase bilirubinemia
e. hepatitis and hepatic cirrhosis are the causes of intrahepatic jaundice
f. posthepatic jaundice is characterized by an increased level of non-conjugated bilirubin in the blood
g. intrahepatic jaundice develops as a consequence of disturbed bilirubin uptake
h. in newborns, the immature blood-brain barrier enables the entrance of bilirubin into CNS

429. Which of the following describes cholelithiasis:

a. can be complicated by acute pancreatitis
b. gallstones develop due to the balance between the levels of cholesterol, bile acids and phospholipids
c. is an acute inflammation of the gallbladder
d. cholesterol stones are composed primarily of calcium bilirubinate
e. biliary colic is the clinical symptom
f. the creation of cholesterol stones is enhanced by an increased amount of phospholipids and bile acids
g. obesity and estrogens enhance the formation of cholesterol stones
h. incomplete and infrequent emptying of the gallbladder facilitates the formation of cholesterol stones

430. Which of the following statements about malabsorption is correct:

a. refers to the defective absorption of nutrients by the intestinal mucosa
b. refers to the defective transport of nutrients by the large-intestinal mucosa
c. inadequate absorption of sugars can result in steatorrhea
d. inadequate absorption of sugars can result in diarrhoea
e. of vitamin B12 can result in megaloblastic anaemia
f. is the cardinal symptom of chronic pancreatitis
g. can occur in many systemic diseases

431. Which of the following statements about malabsorption is correct:

a. can represent defective absorption of a single substance
b. can represent defective absorption of multiple substances
c. a defect in the absorption of Ca can occur due to the insufficient synthesis of vitamin D_3 in the kidneys
d. a defect in the absorption of Ca can occur due to the insufficient synthesis of parathormone in parathyroid glands
e. of amino acids can be caused by defects in the lymphatic system
f. of lipids can be caused by defects of the lymphatic system
g. depends on the absorption of solutes
h. depends on the absorption of minerals

432. Which of the following statements about irritable bowel syndrome is correct:

a. results in constipation altering diarrhoea
b. results in stubborn constipation
c. the patient may defecate pure mucus
d. results in painful dyspepsia
e. is always perceived by an acute GIT infection
f. involves large intestine hypersensitivity to the normal stimuli
g. peristaltic activity remains normal
h. results in the intestinal wall distension

433. In secretory diarrhoea:

a. increased intracellular cAMP stimulates the secretion of chlorides
b. weakly absorbable solutes accumulate in the intestinal lumen
c. increased intracellular cAMP inhibits NaCl absorption
d. absorption of lactose is impaired
e. increased intracellular cGMP stimulates intestinal hypersecretion
f. absorption of electrolytes is impaired
g. cholera can be the cause
h. the malabsorption of nutrients can be the cause

434. In osmotic diarrhoea:

a. increased intracellular cAMP stimulates the secretion of chlorides
b. weakly absorbable solutes accumulate in the intestinal lumen
c. increased intracellular cAMP inhibits NaCl absorption
d. absorption of lactose is impaired
e. increased intracellular cGMP stimulates intestinal hypersecretion
f. absorption of electrolytes is impaired
g. cholera can be the cause
h. the malabsorption of nutrients can be the cause

435. Malabsorption of saccharides leads to:

a. secretory diarrhoea
b. osmotic diarrhoea
c. intestinal ischaemia
d. foamy stool
e. fatty stool
f. stool containing blood, pus, leukocytes

g. intestinal inflammation

436. Constipation:
a. can be both reason and consequence of colon cancer
b. can be caused by an impaired defecatory reflex
c. can be caused by rectal hypersensitivity
d. rectal sensitivity is either normal or decreased
e. can be caused by the impaired gastrocolic reflex
f. occurs in irritable bowel syndrome
g. occurs in acute gastroenteritis
h. hypertonic-hypokinetic and dyskinetic forms of obstipation are called dyschezia

437. Which of the following statements about intestinal obstruction is correct:
a. intestinal contents cannot be forced in an aboral direction
b. is a prolonged period of the passage of intestinal contents
c. can be caused by paralysis of the intestinal musculature
d. pseudoobstruction is mainly caused by intestinal tumours, inflammation, volvulus
e. generally leads to hypoxia of intestinal mucosa
f. hypoxia of intestinal mucosa protects from autodigestion
g. leads to the accumulation of fluid in the intestinal lumen
h. hypertrophy of intestinal musculature develops proximal to the obstruction

438. Aerophagia in intestinal obstruction:
a. is stimulated by hypoxia of intestinal mucosa
b. delivers air into the bowel
c. is an appropriate mechanism to compensate the intestinal hypoxia
d. procures exchange of gases
e. leads to intestinal distension
f. leads to intestinal hypertrophy
g. results in intestinal angularities

439. Which of the following statements about intestinal obstruction is correct:
a. is always curable
b. is curable until ileus develops
c. is always lethal
d. a partial obstruction resides in intussusception, volvulus, incarcerated hernia
e. an impairment of mesenteric vessels and nerves is called intussusception
f. strangulation is a common complication of a single obstacle
g. is caused by paralysis of intestinal musculature
h. abdominal adhesions can cause pseudoobstruction

440. Which of the following statements about ulcerative colitis (UC) is correct:
a. in a majority of cases, the inflammation involves the rectum
b. the acute stage is characterized by a diffuse superficial inflammation
c. the inflammatory process involves all intestinal layers, including the serous surface
d. the intestine is significantly distended
e. haustra of the colon are preserved
f. in prolonged duration, dysplastic changes with signs of malignity take place in epithelial cells
g. leads to anaemia, hypokalaemia
h. the state of a patient depends on the extent of diarrhoea

441. Which of the following statements about Crohn´s disease is correct:
a. is referred to as regional enteritis
b. the inflammatory process involves intestinal mucosa and submucosa
c. both small and large intestines can be involved
d. in prolonged duration, dysplastic changes with signs of malignity take place in epithelial cells
e. the intestine is significantly distended
f. inflammation of the serous intestinal surface incurs the development of adhesions between intestinal loops
g. strictures and perianal fistulae are frequently present
h. is the intestinal immune system disease with a genetic predisposition

442. Bleeding from oesophageal varices leads to:
a. haematemesis
b. haematochezia
c. vomiting of blood that resembles the sediment of black coffee
d. vomiting of bright red blood
e. a gastro-oesophageal reflux
f. an acute life-endangering situation
g. a small insignificant bleeding

443. Which of the following describes abdominal pain:
a. visceral pain is difficult to localize accurately (not precisely localized)
b. visceral pain is intensive and well localized
c. parietal /somatic pain is intensive and well localized
d. food intake can determine the progression and quality of pain
e. can be projected to the extra-abdominal localities
f. coming from the stomach, duodenum, the pancreas is localized in the

epigastrium
g. coming from the stomach, duodenum, the pancreas is localized periumbilically
h. coming from the stomach, duodenum, the pancreas is localized in the right upper quadrant of the abdominal cavity

444. Referred abdominal pain:
a. is due to the divergence of somatic cutaneous and visceral abdominal afferent nerve fibres
b. is due to the convergence of somatic cutaneous and visceral abdominal afferent nerve fibres in different spinal segments
c. is due to the convergence of somatic cutaneous and visceral abdominal afferent nerve fibres in the same spinal segment
d. is perceived in the location of its origin
e. is perceived in remote areas
f. is not precisely localized
g. is localized superficially
h. is usually associated with hyperaesthesia

445. Which of the following describes megacolon:
a. is characterized by the enormously distended large intestine and diarrhoea
b. the stool is absent for several days
c. evacuation of the bowel is frequent
d. the sigmoid colon and rectum are the most frequently afflicted
e. is due to the congenital absence of the intramural neural plexus
f. the intestine below the afflicted portion is dilated and hypertrophic
g. is the defect of the autonomic innervation
h. causes a functional intestinal obstruction

446. Which of the following describes oesophagal diseases:
a. pyrosis is a sign of gastroesophageal reflux
b. burning retrosternal discomfort in pyrosis occurs 6 hours after eating
c. gastroesophageal reflux never causes pulmonary diseases
d. patients with Barret's oesophagus always have pyrosis
e. gastroesophageal reflux is a cause of oesophagal erosions and ulcerations
f. odynophagia is a disorder of deglutition
g. odynophagia occurs as a consequence of oesophagal ulcerations or inflammation
h. gastroesophageal reflux is a cause of Barret's oesophagus and can progress to oesophagal adenocarcinoma

447. Which of the following describes gastritis:
a. in H. pylori-induced gastritis, superficial degeneration of epithelium and excess mucus production are present
b. in H. pylori-induced gastritis, the duodenal ulcer usually does not develop
c. acute haemorrhagic gastritis is often caused by acute chemical irritation
d. in H. pylori-induced gastritis, mainly antrum is affected
e. sepsis or burns do not cause acute injury of gastric mucosa
f. Curling's ulcer is caused by trauma or surgical intervention
g. the initial phase of H. pylori infection is usually asymptomatic
h. autoimmune gastritis affects the gastric corpus

448. Which of the following statement about peptic ulcers is correct:
a. HCl secretion in duodenal ulcers is increased
b. emptying of the stomach is faster in duodenal ulcer
c. epigastric pain in duodenal ulcer relieves after eating
d. gastric ulcer is more frequent in females
e. HCl secretion in gastric ulcers is normal or decreased
f. plasmatic level of gastrin is low in gastric ulcer
g. haemorrhage or perforation are complications of gastric ulcer
h. HCl secretion in Zollinger-Ellison syndrome is decreased

449. Which of the following statement about H. pylori infection is correct:
a. H. pylori is a gram-positive bacillus
b. causes gastritis and peptic ulcer
c. especially harbours areas of the pyloric antrum
d. especially harbours duodenum
e. adhesins released by H. pylori directly induce an inflammatory response
f. H. pylori does not produce urease
g. urease protects H. pylori from HCl
h. each H. pylori infection manifests by epigastric pain

450. Which of the following statement about diseases of the liver is correct:
a. acute hepatic insufficiency is followed by a severe inflammatory reaction
b. hepatic cirrhosis is a reversible change in the structure of the liver
c. the most common causes of hepatic cirrhosis are chronic hepatitis and chronic alcoholism
d. in micronodular cirrhosis, the hyperplastic nodules are bigger than 3 mm
e. micronodular cirrhosis is often caused by alcohol
f. macronodular cirrhosis is the most frequent consequence of hepatitis B
g. in hepatic cirrhosis, the degradation of collagens in the liver is present
h. the consequence of hepatic cirrhosis is portal hypotension

451. Which of the following statement about ascites is correct:

a. is the presence of an excessive amount of fluid in the peritoneal cavity
b. increased hydrostatic pressure and decreased plasma oncotic pressure are present in ascites
c. decreased hydrostatic pressure and increased plasma oncotic pressure are present in ascites
d. increased hydrostatic pressure in portal hypertension causes the hyperfiltration of plasma into the lymphatic system of liver
e. ascites is accompanied by abdominal pain
f. ascites is not accompanied by abdominal discomfort
g. ascites is present in secondary hyperaldosteronism
h. ascites is caused by decreased renin and angiotensin production

452. Which of the following statement about jaundice is correct:

a. is a blue colouring of skin and mucosae
b. is caused by biliverdin accumulation in skin and mucosae
c. prehepatic jaundice is caused by increased haemolysis
d. the conjugated bilirubin level in blood is increased in prehepatic jaundice
e. in intrahepatic cholestasis, jaundice occurs
f. posthepatic jaundice occurs in mechanical obstruction in extrahepatic bile pathways
g. in posthepatic jaundice, the stool is darker
h. in prehepatic jaundice, the urine is lighter

Pathophysiology of the endocrine system

453. What are the effects of atrial natriuretic peptides?

a. promotion of the loss of sodium ions and water in the kidneys
b. stimulation of aldosterone secretion at the suprarenal cortex
c. inhibition of water-conserving hormones secretion, such as ADH and aldosterone
d. suppression of thirst
e. block the effects of angiotensin II and norepinephrine on arterioles
f. elevation of blood pressure
g. stimulation of thirst
h. restriction of salt and water losses at the kidneys

Hypothalamus and hypophysis

454. The hypothalamic releasing hormones include:

a. CRH
b. ACTH
c. glucocorticoids
d. epinephrine
e. dopamine
f. serotonin
g. GnRH
h. TRH

455. Major hormones secreted from the anterior pituitary are:

a. ACTH
b. prolactin
c. growth hormone
d. luteinizing hormone
e. follicle-stimulating hormone (FSH)
f. thyrotropin-releasing hormone (TRH)
g. vasopressin
h. oxytocin

456. Hormones stored and released from neurohypophysis into the circulation are:

a. ACTH
b. prolactin
c. growth hormone
d. luteinizing hormone
e. follicle-stimulating hormone (FSH)
f. thyrotropin-releasing hormone (TRH)
g. vasopressin
h. oxytocin

457. Oxytocin and vasopressin are synthesized in:

a. hypothalamus
b. hypophysis
c. adenohypophysis
d. neurohypophysis
e. hippocampus
f. epiphysis
g. nucleus paraventricularis hypothalami
h. nucleus supraopticus

458. Clinical manifestations of diabetes insipidus are:

a. polyuria and polydipsia
b. polyuria and glycosuria
c. hypotension
d. tachycardia

e. irritability
f. metabolic acidosis
g. polyphagia
h. bradycardia

459. The syndrome of inappropriate antidiuretic hormone (SIADH) is characterized by:

a. the posterior pituitary does not secrete enough antidiuretic hormone (ADH)
b. too much ADH is produced
c. a decreased urinary output
d. water is retained in vascular space
e. an excessive loss of water from the vascular space
f. urine osmolality is increased, and serum osmolality is decreased

Thyroid gland and parathyroids

460. What are the primary effects resulting from the action of thyroid hormones?

a. decreased rate of energy consumption and utilization in cells
b. decreased concentration of calcium ions in body fluid
c. accelerated production of sodium-potassium ATPase
d. activation of genes coding for the synthesis of enzymes involved in glycolysis and energy production
e. accelerated ATP production by mitochondrial
f. in growing children, acceleration of normal development of the skeletal, muscular, and nervous system
g. increased rate of energy consumption and utilization in cells
h. stimulated development of lymphocytes

461. How does the thyroid hormone affect the body?

a. it increases the metabolism of protein, fat, and glucose
b. it increases the use of oxygen due to the hypermetabolism
c. it helps regulate the development of the neural and skeletal systems in fetuses
d. it helps regulate the production of red blood cells
e. it is important for normal growth and development
f. it affects respiratory rate: too much thyroid hormone decreases the respiratory rate, and too little increases the respiratory rate
g. it helps regulate the secretion of growth hormone

462. The enlargement of the thyroid gland can be caused by:

a. vitamin D deficiency
b. inflammation process
c. nodular hypotrophy and hypoplasia of the acinar cells
d. neoplastic process
e. increased intake of iodine
f. intestinal calcium malabsorption
g. increased colloid accumulation in the follicles
h. hypertrophy and hyperplasia of epithelial cells of follicles

463. Symptoms of hyperthyroidism include:

a. exophthalmos
b. an increased heat production (sweating)
c. myxedema
d. growth and mental retardation (perinatal)
e. an increased metabolic rate
f. weight loss
g. hypoventilation
h. an increased cardiac output

464. Symptoms of hypothyroidism include:

a. dyspnea
b. weight loss
c. myxedema
d. tremor, weakness
e. a decreased metabolic rate
f. weight gain
g. a decreased cardiac output
h. exophthalmos

465. Potential causes of hypothyroidism are:

a. infection of the thyroid (viral or bacterial thyroiditis)
b. Hashimoto's thyroiditis
c. thyroidectomy
d. congenital defects
e. hydrocephalus
f. medication, such as sulfonamides, interferon alpha
g. pregnancy
h. iodine deficiency

466. Hypothyroidism can be caused by:

a. thyroid neoplasm
b. Grave's disease
c. surgical destruction of the thyroid
d. Hashimoto's thyroiditis

e. an iodine deficiency
f. autoimmune thyroiditis
g. Conn's syndrome
h. Addison's disease

467. Major effects of parathyroid hormone are:
a. a decreased blood volume
b. increased production of activated vitamin D
c. enhanced active reabsorption of calcium and magnesium from distal tubules
d. stimulation of proteosynthesis
e. a decreased renal calcium reabsorption in the distal tubule
f. an increased bone resorption
g. the reduction of the reabsorption of phosphate from the proximal tubule of the kidney
h. increased absorption of calcium in the intestine

468. Increased levels of calcitonin in the blood (low serum calcium) are associated with:
a. chronic renal failure
b. thyroid cancer
c. kidney stones
d. osteoporosis
e. Zollinger-Ellison syndrome
f. pernicious anaemia
g. liver disease
h. Graves' disease

Suprarenal glands

469. Major hormones secreted from the adrenal medulla are:
a. epinephrine
b. norepinephrine
c. glucocorticoids
d. cortisol
e. serotonin
f. mineralocorticoids
g. sex steroids
h. histamine

470. Major hormones secreted from the adrenal cortex are:
a. epinephrine
b. norepinephrine
c. glucocorticoids
d. cortisol
e. serotonin
f. mineralocorticoids
g. sex steroids
h. histamine

471. Cushing's syndrome is:
a. primary hyperaldosteronism
b. primary hypocortisolism
c. primary hypercortisolism
d. an acute adrenocortical insufficiency
e. secondary hyperaldosteronism
f. a chronic primary adrenocortical insufficiency
g. related to the hyperfunction of the adrenal cortex
h. related to the hypofunction of the adrenal cortex

472. Addison's disease is characterized by:
a. hyperglycemia
b. virilization in females
c. hyperpigmentation
d. central obesity
e. increased cortisol and androgen levels
f. decreased adrenal glucocorticoids, androgens, and mineralocorticoids
g. hypoglycemia
h. increased POMC and ACTH

473. Increased ACTH secretion would be expected in patients:
a. with primary adrenocortical hyperplasia
b. with elevated levels of angiotensin II
c. receiving glucocorticoids for immunosuppression following a renal transplant
d. with chronic adrenocortical insufficiency
e. with secondary adrenocortical insufficiency
f. with Graves' disease
g. with Addison's disease

474. Pheochromocytoma:
a. is a serious disease of the adrenal medulla
b. is a serious disease of the adrenal cortex
c. is a catecholamine-producing tumour
d. is a mineralocorticoids-producing tumour
e. is characterized by arterial hypertension

f. is characterized by metabolic changes

475. Following hormones are produced in the zona fasciculata and/or zona reticularis of the adrenal cortex:

a. aldosterone
b. corticosterone
c. epinephrine
d. cortisol
e. cholesterol
f. dehydroepiandrosterone
g. norepinephrine
h. progesterone

476. The actions of glucocorticoids include:

a. suppression of the immune response
b. inhibition of gluconeogenesis
c. increasing protein catabolism
d. decreasing glucose utilization
e. stimulation of T lymphocytes proliferation
f. maintenance of vascular responsiveness to catecholamines
g. anti-inflammatory effects
h. increasing lipolysis

477. Congenital abnormality – 21β-hydroxylase deficiency is characterized by:

a. increased adrenal androgens
b. hyperplasia of zona glomerularis
c. hyperplasia of zona reticularis and zona fasciculata
d. decreased cortisol and aldosterone
e. decreased ACTH
f. increased 17-hydroxyprogesterone
g. virilization in females
h. hyperglycemia

478. A female patient has hirsutism, hyperglycemia, obesity, muscle wasting, and increased circulating levels of ACTH. The most likely cause of her symptoms is:

a. primary adrenocortical insufficiency (Addison's disease)
b. pheochromocytoma
c. primary overproduction of ACTH (Cushing's syndrome)
d. treatment with exogenous glucocorticoids
e. hypophysectomy
f. primary adrenocortical hyperplasia
g. Conn's syndrome

479. Cushing's syndrome is characterized mainly by:

a. increased muscular mass
b. increased protein catabolism
c. decreased level of blood glucose
d. increased hepatic gluconeogenesis
e. increased fat deposition and redistribution
f. increased protein synthesis
g. osteoporosis
h. increased osmotic diuresis

480. Catecholamines are a crucial part of the body's response to stress. The direct effects of catecholamines are to:

a. decrease heart rate
b. decrease sweating
c. lower urine output
d. increase alertness
e. increase digestion
f. constrict peripheral blood vessels so that blood pressure increases
g. dilate bronchial tubes
h. convert glycogen to glucose

481. Which of the following conditions does Addison's disease characterize:

a. hypervolemia and pulmonary oedema
b. hypovolemia and shock if a severe fluid loss occurs
c. Addisonian crisis (nausea and vomiting, very high temperature, cyanosis)
d. hypoglycemia
e. seizures
f. life-threatening arrhythmia due to hyperkalemia
g. adverse effects of steroid therapy
h. infection: the immune system is impaired anytime steroids are out of balance

Gonads

482. Androgens are known to produce several complications, including:

a. increased muscle mass
b. prostate gland enlargement
c. urinary tract obstruction
d. increased endurance
e. various liver dysfunctions
f. premature closure of epiphyseal plates
g. testicular atrophy and infertility

h. hirsutism

483. What are the primary effects of estrogens?

a. the stimulation of luteinizing hormone (LH) secretion
b. increased frequency of gonadotropin-releasing hormone (GnRH) pulses
c. the stimulation of ovulation
d. the stimulation of the repair and growth of the endometrium
e. the inhibition of secretion of follicle-stimulating hormone (FSH)
f. the establishment and maintenance of secondary sex characteristics
g. the stimulation of bone and muscle growth
h. the reduced frequency of GnRH pulses

Diabetes mellitus

484. Insulin is produced by:

a. A cells
b. B cells
c. D cells
d. F cells
e. G cells
f. exocrine pancreas
g. endocrine pancreas
h. H cells

485. Islets of Langerhans secrete:

a. glucagon
b. chymotrypsinogen
c. amylase
d. somatostatin
e. epinephrine
f. insulin
g. pancreatic polypeptide
h. pepsinogen

486. Major actions of insulin include:

a. increased glycogenolysis and gluconeogenesis
b. increased lipolysis
c. decreased blood K^+ concentration
d. decreased glycogenolysis and gluconeogenesis
e. increased ketoacid production
f. increased uptake of glucose
g. increased protein synthesis
h. increased fat deposition and decreased lipolysis

487. Potential causes of diabetic ketoacidosis (an acute complication of diabetes) are:

a. too much endogenous or exogenous insulin
b. decreased food intake
c. genetics
d. uncontrolled diabetes
e. an insufficient insulin dose
f. skipping routine insulin dose
g. stress
h. taking medications that interfere with insulin secretion

488. For diabetes mellitus (DM) applies:

a. DM is manifested by polyuria, polydipsia, decreased physical performance
b. hyperglycemia occurs due to insulin deficiency
c. glycogenolysis and gluconeogenesis are increased in the liver
d. glycosuria occurs when the renal threshold for glucose 8 mmol/L is exceeded
e. Kussmaul respiration is a compensatory mechanism that helps maintain the physiological range between bicarbonates and free carbonic acid
f. lactic acidosis coma occurs in conditions with severe tissue hypoxia, which are associated with insufficient removal of lactic acid by the liver and kidneys
g. increased insulin requirement during stress is caused by increased secretion of insulin antagonists (cortisol, growth hormone, adrenaline and glucagon)
h. chronic complications of DM include glycated proteins, which arise as a result of the interaction of glucose and proteins, and have different physico-chemical properties than the original proteins, which is manifested by a change in their function

489. Type 1 diabetes mellitus:

a. is induced by the destruction of pancreatic B cells
b. is always immune conditioned
c. absolute insulin deficiency may be due to almost complete or complete death of B cells due to the autoimmune process
d. genetic and environmental factors are involved in its formation
e. may be idiopathic
f. as insulitis, we refer to the inflammatory process in the islets of Langerhans
g. is characterized by hyperglycemia, complete insulin deficiency, the rapid development of ketoacidosis, obesity
h. there is no C-peptide in the blood after the death of all B cells

490. Type 2 diabetes mellitus (DM):

a. is characterized by insulin resistance, relative insulin deficiency and a lack of tendency to ketoacidosis
b. patients are not dependent on exogenous insulin
c. insulin resistance is initially associated with hyperinsulinemia
d. ketoacidosis can be caused by various stressful situations
e. type 2 DM is less common than type 1 DM
f. type 2 DM has a much stronger genetic basis than the autoimmune form of type 1 DM
g. not only one diabetogenic gene is involved in the development, but it is a polygenic type of inheritance
h. skeletal muscle and adipose tissue cells have disrupted insulin-stimulated glucose uptake

491. Type 2 diabetes mellitus (DM):

a. obesity is the most common risk factor for type 2 DM
b. a characteristic feature of patients with type 2 DM is the disappearance of the first (early) phase of insulin secretion, which is considered an early marker of this disease
c. the most important exogenous risk factors for type 2 DM include: obesity, insufficient physical activity and psychoemotional stress
d. plasma amylin levels in patients with type 2 DM are reduced
e. the concentration of proinsulin in the blood of patients with type 2 DM is increased
f. insufficient physical activity is involved in stimulating insulin resistance in skeletal muscle
g. is induced by the primary destruction of pancreatic B cells
h. occurrence is more frequent than type 1 DM

Pathophysiology of the nervous system

492. In Alzheimer's disease, excess abnormal protein fibre debris builds up in the brain tissue and interferes with brain function. Which cell may play a role in the phagocytosis of the debris?

a. ependymal cell
b. oligodendrocyte
c. Schwann cell
d. satellite
e. microglia
f. choroid plexus

493. A patient has metastatic cancer, which blocks the subarachnoid space. Which ventricles will become swollen and dilated with cerebrospinal fluid (a condition called hydrocephalus):

a. lateral ventricles
b. foramen magnum
c. third ventricle
d. fourth ventricle
e. foramen of Magendie
f. aqueduct of Sylvius

494. Which of the following has a much lower concentration in cerebrospinal fluid (CSF) than cerebral capillary blood?

a. Na^+
b. K^+
c. osmolarity
d. protein
e. Mg^{2+}
f. Cl^-

495. The main source of energy for neurons is:

a. glucose
b. amino acids
c. lipids
d. fructose
e. triacylglycerols
f. cholesterol
g. eicosanoids
h. galactose

496. The neuroendocrine stress reaction involves:

a. the sympathoadrenal system
b. the hypothalamic-pituitary-adrenal axis
c. the parasympathetic nervous system
d. catecholamines
e. glucocorticoids
f. vasopressin
g. erythropoietin
h. angiotensin II

497. Intrinsic diseases of the nervous system are characterized by:

a. changes of the chromosomal number
b. CNS infection

c. genetic diseases
d. a neuromuscular disorder
e. involved metabolic disturbances
f. changes of the chromosomal structures
g. changes resulting from the destruction of the nervous system

498. Diseases of the nervous system with mixed or unknown aetiology can be divided into these subgroups:

a. infections of the CNS
b. tumours of the CNS
c. neuroimmunological diseases
d. neuromuscular diseases
e. metabolic disturbances
f. degenerative diseases
g. neuropathies
h. genetical diseases

499. Cerebrospinal fluid:

a. is produced by microglial cells
b. provides some mechanical protection for the brain
c. helps to circulate nutrients and waste between blood and brain tissue
d. is produced by the choroid plexus in the two lateral and the third ventricles
e. pressure, as measured by lumbar puncture, is 8-15 mmHg or 1.1-2 kPa with the patient lying on the side
f. pressure, as measured by lumbar puncture, is 8-15 mmHg or 1.1-2 kPa with the patient sitting up
g. as estimated by lumbar puncture is similar to the intracranial pressure

500. As an actual increase in the volume of CSF within the skull along with elevated intracranial pressure is defined:

a. primary hydrocephalus
b. secondary hydrocephalus
c. obstructive hydrocephalus
d. cerebral atrophy
e. acute pyogenic meningitis
f. acute lymphocytic meningitis

501. The micro-organisms may gain entry into the nervous system by one of the following routes:

a. via blood stream
b. direct implantation
c. local extension
d. retrograde venous route
e. along cranial and peripheral nerves into CNS
f. skull fractures

502. Neuronal injury can occur at different levels, such as:

a. the interruption of nerve cords
b. the interruption of commissures of the brain
c. the interruption of nerve fibres
d. the functional injury caused, for example, by pressure
e. the interruption of the prefrontal cortex
f. death of an axon without the interruption of endoneurial tubes
g. an axonal death with interruption of the endoneurial tubes

503. Apart from the direct, immediate effects of head injury, other common complications that can occur after a few hours and days are:

a. insomnia
b. haemorrhage
c. infection
d. peripheral cyanosis
e. tumours
f. brain oedema
g. a leak of the cerebrospinal fluid
h. dyspnea

504. The vasogenic oedema is caused by:

a. the direct disturbance of the active transport of brain cells
b. the transependymal shift of the cerebrospinal fluid
c. osmotic disturbances
d. changes in the membrane permeability
e. a disturbance of released acetylcholine
f. a disturbance of the Na^+ pump
g. disturbances of the amino acid metabolism
h. the toxic effect of free O^- radicals

505. We distinguish 4 stages of intracranial hypertension:

a. the stage of the total compensation
b. the stage of the partial compensation
c. the stage of stabilization
d. the stage of destabilization
e. the stage of decompensation
f. the stage of the partial decompensation
g. the vasomotor paralysis

506. Hydrocephalus can be caused by:

a. excessive production of cerebrospinal fluid
b. a decrease in the production of cerebrospinal fluid
c. a cerebrospinal fluid flow obstruction
d. a disturbance of the cerebrospinal fluid absorption
e. an increase in resorption of the cerebrospinal fluid
f. congenital stenosis of aqueductus Sylvii
g. atresia of aqueductus Sylvii
h. atresia of foramen Magendie and Luschle

507. The neurodegenerative diseases of the CNS include:

a. Parkinson's disease
b. Alzheimer's disease
c. demyelination disease
d. epilepsy
e. multiple sclerosis
f. myasthenia gravis
g. Fabry syndrome
h. the acute haemorrhagic leukoencephalopathy

508. Prionosis are:

a. contagious diseases
b. neurodegenerative diseases
c. exclusively genetically based
d. not transmitted between different species
e. transmitted between different species
f. accumulation of a gamma-amyloid
g. accumulation of tau proteins
h. accumulation of alpha-synuclein and amyloid

509. Diseases of a motor neuron include:

a. Huntington's disease, chorea
b. Alzheimer's disease
c. amyotrophic lateral sclerosis
d. progressive supranuclear palsy
e. tabes dorsalis
f. myasthenia gravis
g. epilepsy
h. hydrocephalus

510. Neuromuscular diseases include:

a. Huntington's disease, chorea
b. Lambert–Eaton myasthenic syndrome
c. amyotrophic lateral sclerosis
d. progressive supranuclear palsy
e. tabes dorsalis
f. myasthenia gravis
g. epilepsy
h. hydrocephalus

511. Neurodegenerative disorders include:

a. Huntington's disease, chorea
b. Alzheimer's disease
c. amyotrophic lateral sclerosis
d. progressive supranuclear palsy
e. Parkinson's disease
f. myasthenia gravis
g. epilepsy
h. hydrocephalus

512. Microscopic features of Alzheimer's disease include:

a. accumulation of neurofibrillary tangles
b. accumulation of prion proteins
c. accumulation of a beta-amyloid
d. accumulation of an alpha-amyloid
e. accumulation of a gamma-amyloid
f. accumulation of parkin proteins
g. accumulation of tau proteins
h. occurrence senile plaques

513. Parkinson's disease is characterized by:

a. accumulation of alpha-synuclein
b. accumulation of prion proteins
c. accumulation of a beta-amyloid
d. accumulation of an alpha-amyloid
e. accumulation of a gamma-amyloid
f. accumulation of parkin proteins
g. accumulation of tau proteins
h. loss of dopaminergic cells

514. Parkinson's disease is clinically manifested by:

a. typical finger movements
b. typical head tremor
c. typical hand tremor

d. a mask face
e. hypertrophy of heart sympathetic innervation
f. a muscular tonus disturbance
g. generalized seizures
h. abnormal postural tonus

515. Demyelination diseases include:

a. Huntington's disease/chorea
b. multiple sclerosis
c. amyotrophic lateral sclerosis
d. progressive supranuclear palsy
e. Parkinson's disease
f. myasthenia gravis
g. acute disseminated encephalopathy
h. acute hemorrhagic leukoencephalopathy

516. Common features of neurodegenerative diseases include:

a. accumulation of aberrant proteins
b. neuroinflammation
c. mitochondrial abnormality
d. deficit of glutamate
e. deficit of serine
f. deficit of glycine
g. relatively selective loss of neurons of a specific phenotype
h. deficit of aspartate

517. Various pathological processes commonly implicated in cerebrovascular diseases are:

a. fungal infections
b. aneurysm
c. thrombosis
d. rupture of a vessel
e. atherosclerosis
f. hypoxia

518. Cerebrovascular diseases:

a. are all those diseases in which one or more of the blood vessels of the brain are involved in the pathological processes
b. are particularly more common in immunosuppressed individuals, such as AIDS
c. can result in the ischaemic brain damage
d. can result in the intracranial haemorrhage
e. can result in a chronic granulomatous reaction
f. can destroy myelin

519. Traumatic injuries to the brain may result in three consequences which may occur in isolation or combination:

a. hydrocephalus, epidural haematoma, subdural haematoma
b. subdural haematoma, ischaemic brain damage, rupture of an aneurysm
c. epidural haematoma, parenchymal brain damage, hydrocephalus
d. ischaemic brain damage, rupture of an aneurysm, epidural haematoma
e. epidural haematoma, subdural haematoma, parenchymal brain damage
f. cerebral infarction, subdural haematoma, parenchymal brain damage

520. Occlusion of the cerebral arteries by either thrombi or emboli is the most common cause of:

a. intracerebral haemorrhage
b. atherosclerosis
c. neurogenic shock
d. myocardial infarction
e. vascular malformations
f. cerebral infarction

521. Polyneuropathy may be a result of:

a. axonal degeneration
b. segmental demyelination
c. demyelination within the brain
d. transection of peripheral nerves
e. autoimmune demyelination
f. medulloblastoma

522. Subdural haematoma often results from:

a. rupture of aneurysm
b. rupture of veins crossing the cerebral convexities
c. rupture of artery following skull fracture
d. rupture in the posterior circulation
e. rupture of the middle meningeal artery
f. rupture of a vascular malformation

523. …….. is characterised by the accumulation of arterial blood between the skull and the dura mater.

a. subdural haematoma
b. subarachnoid haemorrhage
c. intracerebral haemorrhage

d. cerebral infarction
e. epidural haematoma
f. ventricular dilatation

524. ……. is characterised by the accumulation of venous blood between the dura and the arachnoid.

a. subdural haematoma
b. subarachnoid haemorrhage
c. intracerebral haemorrhage
d. cerebral infarction
e. epidural haematoma
f. ventricular dilatation

525. A patient with multiple sclerosis (MS) has a loss of myelin in her brain. Which cell is responsible for replacing that lost myelin?

a. Schwann cell
b. ependymal cell
c. astrocyte
d. oligodendrocyte
e. microglial cell
f. loss myelin is not replaced

526. The most common sites of berry (saccular) aneurysms causes of subarachnoid haemorrhage are:

a. in relation to basilar artery
b. in relation to anterior communicating artery
c. in relation to meningeal artery
d. at the origin of the posterior communicating artery
e. at the bifurcation of the internal carotid into the middle and anterior cerebral arteries
f. at the first major bifurcation of the middle cerebral artery

527. The main stroke symptoms are:

a. the face may have dropped on one side; the person may not be able to smile
b. the person may not be able to lift both arms
c. speech may be slurred or garbled
d. tremor
e. mood alternations
f. loss of facial expression

528. Causes of communicating hydrocephalus are:

a. intraventricular haemorrhage
b. Arnold-Chiari malformation
c. deficient reabsorption of CSF, e.g. the following meningitis
d. cerebral abscess
e. stenosis of the foramina of the fourth ventricle
f. overproduction of CSF, e.g. choroid plexus papilloma

529. In non-communicating hydrocephalus:

a. is obstruction of the CSF pathway in the third ventricle
b. is no obstruction to the flow of CSF between the ventricles
c. the cause is a congenital abnormality
d. the cause is stenosis of the foramina of the fourth ventricle
e. the cause is spina bifida cystica
f. cause are tumours adjacent to the ventricular system

530. The disease presents as recurrent attacks of focal neurologic disorder with a predilection for involvement of the spinal cord, optic nerve and brain. The usual age at onset is 20-40 years:

a. Acute disseminated encephalomyelitis
b. Alzheimer's disease
c. Multiple or disseminated sclerosis
d. Guillain-Barré syndrome
e. Amyloidosis
f. Leucodystrophies

531. The reason for the undue vulnerability of neurons to hypoxia can be explained by various factors:

a. different cerebral circulation blood flow
b. presence of excitatory acid neurotransmitters called excitotoxins
c. increased sensitivity of neurons to toxins
d. increased sensitivity of neurons to lactic acid
e. excessive metabolic requirement of these neurons
f. presence of acid inhibitory neurotransmitters called excitotoxins

532. The diagnostic alterations in the CSF in acute pyogenic meningitis are:

a. elevated CSF pressure
b. decreased CSF pressure
c. normal CSF pressure
d. polymorphonuclear neutrophilic leukocytosis in CSF
e. CSF sugar concentration is usually normal
f. CSF sugar concentration markedly reduced

533. The diagnostic alterations in the CSF in viral meningitis are:

a. CSF bacteriologically sterile
b. CSF protein is usually normal or mildly raised
c. CSF protein markedly raised
d. CSF pressure increased
e. clear CSF
f. cloudy or purulent CSF

534. Clinical manifestations of brain abscess are:

a. low-grade fever
b. headache
c. neck pain
d. seizures and neurological deficits
e. bradykinesia
f. paralysis

535. The synaptic action of acetylcholine is terminated by:

a. re-uptake of acetylcholine
b. biodegradation by acetylcholinesterase
c. exclusively by diffusion from the synaptic cleft
d. enzyme acetylcholinesterase
e. transfer through the blood-brain barrier
f. re-uptake by immune cells
g. diffusion
h. osmosis

536. The alteration of the cholinergic system predominates in:

a. Alzheimer's disease
b. Parkinson's disease
c. Creutzfeldt-Jakob's disease
d. hydrocephalus
e. depression
f. multiple sclerosis
g. curu
h. prionosis

537. Catecholamines include:

a. epinephrine
b. dopamine
c. serotonin
d. histamine
e. norepinephrine
f. glutamate
g. GABA
h. glycine

538. Alteration of dopaminergic system is predominant finding in:

a. Parkinson's disease
b. Alzheimer's disease
c. Creutzfeldt-Jakob's disease
d. myasthenia gravis
e. amyotrophic lateral sclerosis
f. multiple sclerosis
g. curu
h. prionosis

539. One of the most important mediators of the stress reaction is:

a. melatonin
b. nerve growth factors
c. catecholamines
d. glucocorticoids
e. glycine
f. GABA
g. serotonin
h. histamine

540. Which of the following describes a pathologic manifestation of neurogenic shock?

a. release of vasodilatory mediators such as histamine into the circulation
b. loss of sympathetic activation of arteriolar smooth muscle
c. a sudden decrease in blood pressure
d. a sudden increase in blood pressure
e. massive immune system activation
f. increased sympathetic nervous stimulation

541. Risk factors for stroke include the following:

a. arterial hypertension
b. smoking
c. insulin resistance
d. brain trauma
e. systematic corticosteroids
f. the presence of lipoprotein-A

542. In classic cerebral concussion:

a. consciousness is lost for up to 6 hours, and reflexes fail
b. retrograde and anterograde amnesia exist
c. occurs muscle atrophy
d. occurs head pain and nausea
e. occlusion of the vessel lumen by thrombus or embolus exist
f. occurs hypertension

543. Clinical manifestations of subarachnoid haemorrhage are:

a. chronic, nondescript headache
b. sudden, throbbing, “explosive” headache
c. a pounding headache
d. visual disturbances
e. loss of consciousness related to a dramatic rise in intracranial pressure
f. abdominal pain

544. Cerebral infarctions are:

a. thrombotic or embolic or haemorrhagic
b. ischemic or haemorrhagic
c. diffuse brain injuries
d. vertebral injuries
e. associated with gradual vessel occlusion (e.g. atheroma)
f. associated with brain tumours

545. Dramatic clinical manifestations of encephalitis include:

a. severe photophobia
b. a petechial or purulent rash covers the skin and mucous membrane
c. fever
d. delirium or confusion progressing to unconsciousness
e. seizure activity
f. nuchal rigidity

546. Epilepsy is characterized by:

a. the presence of seizures
b. an increased neuronal activity
c. a decreased neuronal activity
d. aura
e. the mutation in the gene for nicotinic receptor
f. a deficit in the excitatory neurotransmitter glutamate
g. a deficit in inhibitory neurotransmitter GABA

547. The following statement about spinal cord injuries is correct:

a. they occur mainly due to trauma
b. the paralysis occurs above the location of the damage
c. the paralysis occurs below the location of the damage
d. a spinal shock lasts less than 24 hours
e. they induce the development of hydrocephalus
f. the damage to the spinal cord at the C1/C2 often results in a loss of breathing
g. they lead to an altered perception of colours
h. spinal cord lesions above T6 can lead to autonomous dysreflexia

548. The symptoms of Parkinson's disease include:

a. bradykinesia
b. macrographia
c. micrographia
d. tremor
e. loud speech
f. problems with swallowing
g. muscle stiffness
h. the ability to quickly respond to life-threatening situations

549. The main functions of the cerebellum include:

a. coordination of movement
b. perception of pain
c. pressure sensation
d. perception of colours
e. maintaining a balance
f. regulation of dopamine secretion
g. maintaining an upright posture and muscle tone
h. perception of temperature changes

550. Which brain area is affected by the death of dopaminergic neurons in Parkinson's disease?

a. basal ganglia
b. nucleus tractus solitarii
c. lateral dorsal nucleus
d. posterior nucleus
e. dorsomedial hypothalamus
f. the ventromedial nucleus of the hypothalamus
g. substantia nigra
h. nucleus paraventricularis hypothalami

551. Alzheimer's disease is characterized by:

a. changes in the transport of choline
b. changes in acetylcholine release
c. changes in the gene expression of nicotinic and muscarinic receptors
d. a decrease in the number of cholinergic neurons
e. changes in transport of epinephrine
f. changes in the transport of norepinephrine
g. a decrease in the number of dopaminergic neurons
h. a decrease in the number of noradrenergic neurons

552. Carbidopa is effective in the management of Parkinson's disease because:

a. it is an effective D2 antagonist
b. it is a potent inhibitor of peripheral decarboxylase
c. it is a potent inhibitor of central decarboxylase
d. it is an agonist for GABA receptors
e. it is an antagonist of GABA receptors
f. it crosses the blood-brain barrier
g. it does not cross the blood-brain barrier

553. The most important component of the EEG in adults lying with closed eyes is:

a. alpha rhythm
b. beta rhythm
c. gamma rhythm
d. delta rhythm
e. omega rhythm
f. eta rhythm
g. epsilon rhythm
h. theta rhythm

554. Which types of neurons are mainly present in the core of the cerebellum?

a. Golgi
b. Purkinje
c. granular
d. basket
e. astrocytes
f. fusiform
g. lunar
h. unipolar

555. Which hypothalamic areas are responsible for the induction of feeling of hunger?

a. nucleus paraventricularis hypothalami
b. nucleus supraopticus
c. nucleus ventromedialis hypothalami
d. lateral hypothalamus
e. nucleus arcuatus
f. premammilar nucleus
g. area preoptica
h. nucleus hypothalamicus posterior

556. Basal ganglia include:

a. nucleus arcuatus
b. nucleus caudatus
c. globus pallidus
d. nucleus lenticularis
e. putamen
f. striatum
g. corpus Luysii
h. nucleus subthalamicus

557. An increase in brain tissue volume may result from:

a. cytotoxic oedema
b. glioblastoma
c. high pressure in the right atria
d. Alzheimer’s disease
e. vasogenic oedema
f. Parkinson’s disease
g. amyotrophic lateral sclerosis
h. hyperthyreosis

558. High intracranial pressure is usually manifested by:

a. headache
b. vomiting
c. drowsiness
d. papilledema
e. a blurry vision
f. shivering
g. fever
h. unconsciousness

559. The neocortex is usually organized in:

a. 2 layers
b. 3 layers
c. 6 layers

d. 8 layers
e. 1 layer
f. 4 layers
g. 5 layers
h. 7 layers

Pathophysiology of the blood

Anaemia

560. Hematopoiesis:
a. GM-CSF (granulocyte-macrophage colony-stimulating factor) is an important hematopoietic growth factor in thrombopoiesis
b. during embryogenesis, it is located in the bone marrow
c. during adulthood, it is located in the bone marrow in the femur and tibia
d. extramedullary hematopoiesis is located in the liver and spleen
e. during embryogenesis, it is located in the reticuloendothelial system
f. in children, it occurs mainly in the cranium and vertebrae

561. In the development of blood cells:
a. the earliest stage is represented by the pluripotent stem cells
b. the lymphoid stem cells give rise to granulocytes
c. the myeloid stem cells give rise to thrombocytes
d. the differentiation and maturation of B-cells occur in bone marrow
e. the differentiation and maturation of B-cells occur in lymph nodes
f. the spleen colony-forming units (CFU-S) further differentiate into lymphocytes
g. interleukin IL-3 is an important hematopoietic growth factor in lymphopoiesis

562. Anaemia is characterized by:
a. a condition with haemoglobin reduction
b. a condition with increased hematocrit
c. the formation of 2,3-DPG in erythrocytes is decreased
d. 2,3-DPG binding with haemoglobin results in the oxyhemoglobin curve shift to the left
e. 2,3-DPG binding with haemoglobin results in the oxyhemoglobin curve shift to the right
f. a decreased level of carboxyhemoglobin

563. Normochromic, normocytic anaemias include:
a. posthemorrhagic anaemia
b. hemolytic anaemias
c. aplastic anaemias
d. sickle cell anaemias
e. iron deficiency anaemias
f. sideroblastic anemias
g. sideropenic anaemias

564. Hypochromic, microcytic anaemias include:
a. anaemias with a low mean corpuscular volume of erythrocytes
b. iron deficiency anaemias
c. thalassemias
d. sideroblastic anemias
e. pernicious anaemias
f. anaemias with a normal mean corpuscular volume of erythrocytes
g. aplastic anaemia
h. sickle cell anaemias

565. Which of the following mechanisms can cause anaemia:
a. acute bleeding
b. chronic bleeding
c. excessive destruction of erythrocytes by alloantibodies
d. excessive destruction of erythrocytes by autoantibodies
e. a lack of intrinsic factor to absorb vitamin B_2
f. increased demand in pregnancy
g. the bone marrow failure

566. Compensatory mechanisms in anaemia are:
a. capillary vasoconstriction
b. increased heart rate
c. increased stroke volume
d. increased production of erythropoietin in bone marrow
e. increased production of erythropoietin by endothelial cells in the kidneys
f. increased production of erythropoietin by mesangial cells in the kidneys
g. hyperdynamic circulation
h. decreased 2,3-DPG in cells

567. Aplastic anaemia:
a. is pancytopenia with bone marrow hypercellularity
b. can be caused by parvovirus B19
c. can be caused by chloramphenicol
d. is the failure of pluripotential stem cells
e. is characterized by reticulocytosis

f. is characterized by thrombocytosis and leukocytosis

568. Iron deficiency anaemia is characterized by:
a. koilonychia
b. glossitis
c. decreased total iron-binding capacity
d. increased transferrin saturation
e. increased ferritin
f. headache
g. a normal mean corpuscular volume of erythrocytes

569. Iron deficiency anaemia:
a. is due to the iron loss from the organism during pregnancy
b. is due to the iron loss from the organism during repeated transfusions
c. is due to the impaired absorption
d. is common in patients with gastrointestinal carcinomas
e. is hypochromic macrocytic anaemia
f. is microcytic hyperchromic anaemia

570. Sideroblastic anaemia is characterized by:
a. elevated iron level in serum
b. decreased iron level in serum
c. enhanced transferrin saturation
d. haemosynthesis disturbance
e. the time of cell maturation is always impaired
f. impairment of the activity of alfa aminolevulinic synthetase
g. sideroblasts greater than the mature erythrocytes
h. disturbances of pyridoxine metabolism

571. Haemosiderosis can develop:
a. after repeated blood transfusions
b. during pregnancy
c. during childhood
d. after gastrectomy
e. in liver and heart
f. in patients with achlorhydria
g. in patients with malignancies of the proximal part of the jejunum
h. in patients with myelodysplastic syndrome

572. Megaloblastic anaemia:
a. is due to the impaired DNA synthesis
b. is due to the vitamin B12 and/or folic acid deficiency
c. is common in chronic alcoholism
d. is common after total gastrectomy
e. is common after the jejunum resection
f. may develop in association with cytostatic treatment
g. is common in vegetarians and vegans
h. is macrocytic hypochromic anaemia

573. In patients with megaloblastic anaemia can be found:
a. thrombocytopenia
b. bradypsychia
c. dizziness
d. tinnitus
e. angina pectoris
f. congestive heart failure
g. smooth, red and painful tongue
h. neurological symptoms

574. Hemolytic anaemia is characterized by:
a. a decreased amount of reticulocytes
b. conjugated hyperbilirubinemia
c. positive Coombs test
d. jaundice
e. increased haptoglobin
f. splenomegaly
g. presence of autoantibodies

575. Hereditary hemolytic anaemia includes:
a. spherocytosis
b. elliptocytosis
c. pyruvate kinase deficiency
d. cold-antibody induced hemolytic anaemia
e. warm-antibody induced hemolytic anaemia
f. microangiopathic hemolytic anaemia
g. defects of the erythrocyte membrane, haemoglobin and enzymes

576. β-thalassemia major is characterized by:
a. the absence of β-chains
b. the absence of α-chains
c. overproduction of α-chains
d. overproduction of β-chains
e. microcytosis, poikilocytosis, Howel-Jolly bodies
f. no HbF and HbA2

g. substantial bone marrow, liver and spleen hypertrophy
h. most common in Asians

577. Microangiopathic hemolytic anaemia is characterized by:
a. formation of fibrin microthrombi
b. normal erythrocytes are fragmented
c. the thrombocytopenia
d. development in patients with disseminated intravascular coagulation
e. development in patients with malignant diseases
f. development in patients with thrombotic thrombocytopenic purpura
g. decreased level of reticulocytes
h. increased level of conjugated bilirubin

578. In patients with cold-antibody-induced hemolytic anaemia can be found:
a. positive Coombs test
b. negative Coombs test
c. cold agglutinins bounding with erythrocytes at the temperature up 4 to 30ºC
d. increased level of non-conjugated bilirubin
e. increased level of haptoglobin
f. jaundice
g. acrocyanosis
h. decreased level of reticulocytes

579. Sickle cell anaemia is characterized by:
a. the substitution of valine by alanine
b. the substitution of valine for glutamic acid
c. the substitution of glutamic acid for valine
d. the presence of haemoglobin A1
e. the presence of drepanocytes
f. bone pains, spleen auto-infarctions and renal damage during crises
g. resistance to Plasmodium falciparum
h. mutation in DNA

Myeloproliferative and lymphoproliferative disorders

580. The normal values of blood count are:
a. leukocytes 4 – 10 G/L
b. leukocytes 4 – 10 x 10/9/L
c. leukocytes 4 – 10 x 10/6/L
d. platelets 150 – 450 G/L
e. platelets 150 – 450 x 10/6/L
f. haemoglobin 120 – 160 g/L
g. haemoglobin 120 – 160 G/L
h. hematocrit 30 – 50%

581. The myeloproliferative disorder is:
a. characterized by the mutation of lymphoid progenitor cell
b. chronic myeloid leukaemia
c. chronic lymphoid leukaemia
d. acute myeloid leukaemia
e. polyglobulia
f. secondary thrombocytosis
g. thrombocytopenia
h. polycythemia vera

582. Common characteristics of myeloproliferative disorders are:
a. hyperuricemia
b. thromboembolic complications
c. extramedullary hematopoiesis
d. a risk of transformation to secondary leukaemia
e. an uncontrolled expansion of lymphoid progenitor cells
f. abnormal proliferation and differentiation of malignant cells

583. Chronic myeloid leukaemia:
a. is a myeloproliferative disorder with the expansion of all bone marrow cell types
b. the Philadelphia chromosome represents chromosomal translocation 9,21
c. in peripheral blood, mostly immature cells are present
d. the accelerated phase is characterized by an increasing number of blasts
e. splenomegaly is present
f. can be caused by cellular oncogenes activation

584. Typical findings in polycythaemia vera include:
a. mutation of tyrosine kinase JAK 2
b. hypotension
c. pruritus
d. plethora
e. pancytopenia
f. haemorrhages
g. thrombotic complications
h. increased level of histamine

585. The following statement about acute leukaemias is correct:
a. acute lymphoblastic leukaemia is typical in adults

b. leukocytosis and more mature cells appear in peripheral blood
c. leukopenia with agranulocytosis can be present
d. infiltration of parenchymatous organs can be present
e. disseminated intravascular coagulopathy is typical for AML-M3
f. there is less than 20% of myeloblasts in the bone marrow
g. bone pain is typical
h. the leukemoid reaction is present

586. The following statement about chronic lymphocytic leukaemia is correct:
a. is a low-grade leukaemia lymphoma
b. is a clonal proliferation of morphologically immature lymphocytes
c. can be complicated by autoimmune hemolytic anaemia
d. the lymphocytes are immunologically competent
e. the presence of the Philadelphia chromosome is typical
f. hepatosplenomegaly and lymphadenopathy are present
g. fibrosis of bone marrow is typical

587. Multiple myeloma is characterized by:
a. bone pain
b. osteolytic lesions
c. immunodeficiency
d. acute renal failure due to paraprotein deposition (mainly free light chains)
e. hypercalcemia
f. thrombocytopathy caused by free light chains
g. hyperviscosity syndrome
h. increased erythrocyte sedimentation

588. The following statements describe essential thrombocythemia:
a. is a lymphoproliferative disorder with increased proliferation of platelets
b. is a myeloproliferative disorder with decreased proliferation of platelets
c. terminal stage is characterized by fibrosis
d. the patient can present with hematemesis, melena and pulmonary embolism
e. prefibrotic stage is characterized by thrombocytosis
f. Philadelphia chromosome is present
g. the aggregability of thrombocytes is always increased
h. essential thrombocythemia can transform into acute leukaemia

589. The following statements describe chronic idiopathic myelofibrosis:
a. in the first stages, the increased thrombopoiesis is present
b. in the advanced stage, fibrosis may occupy the whole space in bone marrow
c. in the advanced stage, the pancytopenia is present
d. splenomegaly and hepatomegaly are not common
e. typical is hypercellular bone marrow in advanced stage
f. extramedullary hematopoiesis is not present
g. ascites and portal hypertension may develop
h. repeated transfusion leads to hemosiderosis in these patients

590. For polycythemia vera is typical:
a. increased level of haemoglobin and normal hematocrit
b. increased level of haemoglobin and also hematocrit
c. increased level of erythropoietin
d. decreased level of erythropoietin
e. increased sedimentation
f. decreased sedimentation
g. saturation of O2 is normal
h. thromboembolic complications

591. Patients with acute lymphoblastic leukaemia can present with:
a. infiltration of the central nervous system
b. infiltration of the liver
c. infiltration of the testes
d. hyperleukocytosis
e. agranulocytosis
f. thrombocytopenia
g. bone pain
h. hyperuricemia

592. Urgent conditions in patients with acute leukaemia are:
a. septic shock
b. bleeding complications
c. tumor lysis syndrome
d. acute renal failure
e. hyperkalemia
f. pathologic microcirculation
g. cerebral haemorrhage
h. myocardial infarction in patients with leukocytosis

593. Acute myeloblastic leukaemia:
a. is typical in children
b. is typical in adults
c. can develop from myelodysplastic syndrome
d. there is about 10-20% of blasts in bone marrow
e. acute promyelocytic leukaemia has a very poor prognosis
f. the promyelocytes release enzymes from granules and stimulate

disseminated intravascular coagulation

594. In patients with multiple myeloma, you can find:
a. polyclonal synthesis of immunoglobulins
b. monoclonal synthesis of immunoglobulins
c. elevated values of erythrocyte sedimentation rate
d. decreased values of erythrocyte sedimentation rate
e. pathological fractures
f. acute renal failure due to heavy chains of immunoglobulins
g. acute renal failure due to light chains of immunoglobulins
h. hyperviscosity syndrome

595. Multiple myeloma:
a. is myeloproliferative disorder
b. is lymphoproliferative disorder
c. is a clonal proliferation of plasma cells
d. in bone marrow, there is less than 10% of plasma cells
e. cytokines released from plasma cells are responsible for the symptoms
f. anaemia is not typical

Hemostasis

596. During primary hemostasis, the following processes occur:
a. dissolution of fibrin clot
b. activation of the clotting cascade
c. blood vessel contraction
d. deposition and stabilisation of fibrin
e. adhesion and aggregation of thrombocytes
f. subendothelial collagen exposure

597. What is true for the coagulation cascade:
a. thrombin activates tissue factor
b. thrombin activates fibrinogen
c. thrombin activates plasminogen
d. factor IX is a co-factor of factor FVIII
e. Von Willebrand factor is not important in primary hemostasis
f. factor X is activated by factor IX
g. factor XIII is important for the stabilization of a fibrin clot

598. Bleeding in disseminated intravascular coagulation results from:
a. depletion of tissue factor
b. depletion of factor VIII
c. depletion of thrombin
d. depletion of many coagulation factors
e. thrombocytopenia
f. hypofibrinogenemia

599. Hemophilia A is characterized by:
a. the deficiency of factor VIII
b. the deficiency of factor X
c. the deficiency of the von Willebrand factor
d. the deficiency of factor IX
e. musocal bleeding
f. excessive bleeding following the extraction of a small tooth

600. Von Willebrand disease:
a. is characterised by the defect of factor IX
b. its inheritance is autosomal dominant
c. is caused by malnutrition
d. can be treated with the administration of heparin
e. can be treated with the administration of antifibrinolytics
f. can be treated with the administration of desmopressin

601. Prolonged partial thromboplastin time (PTT) can be present:
a. in disorders of the intrinsic coagulation cascade
b. in disorders of the extrinsic coagulation cascade
c. in immunocoagulopathies
d. during heparin treatment
e. during warfarin treatment
f. as a result of factor VII defect

602. Trombocytopathy:
a. can be caused by acetylsalicylic acid administration
b. can be caused by the use of non-steroid anti-inflammatory drugs
c. can be inherited
d. can be caused by the dysfunction of the receptor IIb/IIIa
e. is a disorder of secondary hemostasis
f. is characterized by shortened bleeding time
g. cannot be treated by thrombocyte transfusions

603. Which of the following initiates the coagulation cascade in vivo?
a. factor XII
b. thrombin
c. tissue factor

d. factor X
e. prekallikrein
f. factor VII
g. factor VIIa
h. factor V

604. Which test evaluates the extrinsic pathway?
a. prothrombin time (INR)
b. partial thromboplastin time
c. activated partial thromboplastin time
d. thrombin time
e. closure time
f. bleeding time
g. platelet aggregability
h. Rumpel-Leede test

605. Thrombocytopenia and thrombocytopathy are typically associated with the following:
a. soft tissues haemorrhages
b. prolonged partial thromboplastin time
c. normal bleeding time
d. epistaxis
e. normal aggregability of thrombocytes
f. petechiae
g. ecchymoses
h. hypercoagulability

606. The following statements about platelets are correct:
a. they are important for primary hemostasis
b. together with coagulation factors are included in secondary hemostasis
c. thrombocytopathy can be present in patients with uremia
d. thrombocytopathy can be present in patients with a myeloproliferative disorder
e. thrombocytopathy can be present in patients with cirrhosis
f. thrombocytosis can be present in patients with inflammation
g. thrombocytosis can be present in patients with myeloproliferative disorders

607. The following statements about thrombotic thrombocytopenic purpura are correct:
a. it can manifest with central nervous system symptoms
b. is caused by a toxin produced by Escherichia coli
c. does not show a microangiopathic blood picture
d. the blood smear shows schistocytes
e. kidney failure can develop
f. microangiopathic hemolytic anaemia is present

608. The causes of thrombocytopenia can be:
a. aplastic anaemia
b. enlarged spleen
c. acute lymphoblastic leukaemia
d. acute myeloblastic leukaemia
e. multiple myeloma
f. disseminated intravascular coagulopathy
g. thrombotic thrombocytopenic purpura
h. hemolytic-uremic syndrome

609. Haemophilia:
a. is X-linked recessive hemorrhagic disease
b. is X-linked dominant hemorrhagic disease
c. is an autosomal recessive hemorrhagic disease
d. haemophilia A is a deficiency of factor X
e. haemophilia A is a deficiency of factor VII

Carcinogenesis and the pathophysiology of malignant diseases

610. The increased activation of protooncogenes is caused by:
a. mutations
b. amplifications
c. chromosomal translocations
d. deletions
e. only if both alleles of the same gene are damaged
f. solely due to chemical carcinogens

611. The role of tumour-suppressor genes is:
a. in DNA reparation
b. in the induction of apoptosis
c. to limit the excessive growth of cells
d. to accelerate the cell cycle
e. to suppress the apoptosis
f. to stimulate the excessive cell growth

612. Which of the following statements about females with "BRCA 1" mutation is correct:
a. the lifetime risk of developing breast cancer is greatly increased

b. the lifetime risk of developing breast cancer is decreased
c. the lifetime risk of developing ovarian cancer is increased
d. surveillance is required
e. all of them will develop breast cancer
f. the lifetime risk of developing cervical cancer is increased

613. During the various stages of the disease, the malignant cells usually obtain the following characteristics:

a. the independence from signals stimulating the growth
b. refractoriness to growth-inhibitory signals
c. increased proliferative capacity
d. decreased differentiation
e. apoptosis ability
f. reduced proliferative capacity

614. The process of angiogenesis includes:

a. endothelial cell proliferation
b. degradation of the basal membrane
c. endothelial cell migration
d. podocyte maturation
e. inactivation of vascular endothelial factor
f. podocyte migration

615. Mutation:

a. is a permanent change in the DNA sequence
b. can be transmitted from generation to generation
c. affects tumour suppressor genes and/or protooncogenes
d. cannot be transmitted from generation to generation
e. affects only DNA in embryo cells
f. affects only DNA in somatic cells

616. Metamyelocyte is a precursor of:

a. monocyte
b. thrombocyte
c. erythrocyte
d. granulocyte
e. lymphocyte
f. megakaryocyte

617. Hereditary forms of colon cancer are associated with:

a. APC gene
b. MSH2 gene
c. WT gene
d. RB gene
e. BRCA1 gene
f. VHL gene

618. Ionizing radiation is harmful, especially for:

a. kidneys
b. smooth muscles
c. striated muscles
d. epidermis
e. germinal tissues
f. hematopoietic tissues

619. Acute leukaemia is a disease:

a. of childhood and adulthood
b. affecting bone marrow
c. characterized by malignant transformation of stem cells during early differentiation
d. of the lymphoproliferative tissue
e. characterized by the presence of Reed-Sternberg cells
f. characterized by malignant transformation of mature haematopoietic cells

620. Philadelphia chromosome:

a. is usually present in patients with acute lymphoblastic leukaemia
b. is present in patients with chronic myeloid leukaemia
c. is characterized by translocation of BCR / ABL
d. is usually present in patients with Hodgkin's lymphoma
e. is characterized by translocation TEL/AML
f. is usually present in patients with lung cancer

621. Acute leukaemia is characterized by:

a. anaemia
b. thrombocytopenia
c. the presence of blasts in the peripheral blood
d. the presence of Reed-Sternberg cells in lymph nodes
e. leucopenia, which always occurs
f. hypokalemia

622. Chronic lymphocytic leukaemia is characterized by:

a. leukocytosis
b. lymphocytosis
c. hypogammaglobulinemia

d. excess of androgens
e. gynecomastia
f. hypergammaglobulinemia

623. Which of the following statements about Hodgkin´s lymphoma is correct:
a. can affect children as well as adults
b. affects mostly pre-school children
c. Reed-Sternberg cells are typical
d. lymphadenopathy is typical
e. metastasizes to the brain
f. pruritus is not present

624. For non-Hodgkin´s lymphoma, the following statements are correct:
a. its occurrence increases with age
b. it arises mostly from B-lymphocytes
c. painless lymphadenopathy can be present
d. Reed-Sternberg cells can be present
e. lymph nodes are not palpable
f. the extranodal affliction of other organs can not be present

625. The most common oncological diseases in children include:
a. leukaemias
b. lymphomas
c. renal tumours
d. bone tumours
e. CNS tumours
f. sarcomas

626. The following examination has the greatest diagnostic benefit in leukaemia suspicion:
a. peripheral blood smear
b. bone marrow biopsy
c. histochemical
d. angiography
e. scintigraphy
f. electrocardiography

627. The main causes of death in patients with leukaemias include:
a. haemorrhagia
b. infection
c. hypokalemia
d. attacks of paroxysmal tachycardia
e. acidosis
f. alkalosis

628. The lethal effect of ionizing irradiation can be prevented by the protection of:
a. germinal tissue
b. CNS
c. liver
d. bones with bone marrow
e. hair follicles
f. kidneys

629. Chemical carcinogens include:
a. nitrosamines
b. polycyclic aromatic hydrocarbons
c. carbon dioxide
d. nitric oxide
e. probiotics
f. carbon monoxide

630. Stages of malignant growth include:
a. initiation
b. progression
c. promotion
d. hypertrophy
e. hyperplasia
f. metaplasia

631. Currently, we know approximately:
a. 100 protooncogenes
b. 350 protooncogenes
c. 1000 protooncogenes
d. 10 protooncogenes
e. 500 protooncogenes
f. 5-10 protooncogenes

632. Abnormal activation of protooncogenes results in encoded proteins being synthesized:
a. in reduced amounts
b. in increased amounts
c. in altered quality
d. in normal quality
e. only during embryogenesis

f. in undetectable amounts

633. Tumour-suppressor genes can gain oncogenic potential by:
a. chromosomal translocations
b. mutations
c. deletion
d. amplifications
e. in the mitotic phase of the cell cycle
f. heredity only

634. If DNA damage is irreversible:
a. the cell cycle continues in the G1 phase
b. the cell cycle does not continue in the G1 phase
c. apoptosis is initiated
d. DNA degradation is initiated
e. the cell cycle is accelerated
f. the synthesis phase is initiated

635. The concept of genomic instability is related to:
a. chromosomal rearrangements
b. defects in RNA repair systems
c. distribution of chromosomes
d. characteristic of cancer
e. chromosomal duplication
f. younger age
g. a pathological variant of one gene
h. mutation

636. In normal cells, the cell cycle is characterized as the series of events leading to:
a. duplication of a genetic material
b. fusion of chromosomes during mitosis
c. separation of chromosomes
d. separation of DNA copies into daughter cells
e. accumulation of different kinds of damages
f. apoptosis
g. necrosis
h. the transition from metaphase to anaphase

637. In checkpoints of a cell cycle:
a. cycle accelerates
b. cycle slows down
c. are checking control mechanisms for normal blood perfusion
d. are checking control mechanism for the fidelity of cell division
e. are checking control mechanism for RNA repairing
f. the volume of the cell mass increases
g. chromosomes become separated

638. MicroRNAs:
a. are encoding RNA segments
b. are non-coding RNA segments
c. can interfere with a certain section of RNA
d. are dysregulated in cancer cells
e. are post-transcriptional regulators
f. have gene regulation functions
g. can be useful as markers for the early detection of tumours
h. are double-stranded molecules

639. Which are correct statements in association with epigenetics:
a. epigenetic changes are changes in gene expression without altering the sequence of nucleotides
b. epigenetic changes relate to changes in chromatin
c. epigenetic changes include DNA methylation and histone modification
d. DNA methylation can activate or repress gene activation
e. the basic unit of chromatin is a nucleosome
f. a nucleosome consists of histone molecules
g. the basic unit of chromatin is a nucleus

640. What type of cells in tumour needs special attention for the ability to give rise to all cell types:
a. fibroblasts
b. cardiomyocytes
c. adipocytes
d. monocytes
e. cancer stem cells
f. macrophages
g. epithelial cells
h. endothelial cells

641. Cancer stem cells:
a. are not tumorigenic
b. are tumorigenic
c. inhibit angiogenesis
d. usually represent a minor subpopulation of tumour cells
e. are forming by the epithelial-mesenchymal transition

f. their increased presence in the tumour is associated with a better prognosis
g. can arise from progenitor cells
h. their increased presence in the tumour is associated with a worse prognosis

642. Which are correct statements in association with angiogenesis:
a. the main pro-angiogenic factor is VEGF-A
b. excessive production of pro-angiogenic factors is due to hypoxia
c. solid tumours greater than 1- 2 cubic millimetres need vascularization
d. angiogenesis is not affected by the tumour microenvironment
e. matrix-metalloproteinases have no role in angiogenesis
f. angiogenesis can be interrupted by inhibiting matrix-metalloproteinases
g. angiogenesis can be interrupted by inhibiting endothelial cell proliferation
h. angiogenesis results in an abnormal vascular permeability

643. The proangiogenic factors include:
a. FGF
b. VEGF
c. ACE
d. PDGF
e. endostatin
f. HIF-1 alfa
g. angiostatin
h. IL-1

644. Acute leukaemia results from genetic and epigenetic alterations in:
a. hematopoietic stem cells
b. progenitors
c. thrombocytes
d. erythrocytes
e. adipocytes
f. endothelial cells
g. neurons
h. myocytes

645. Which are correct statements in association with antiangiogenic therapy of cancer:
a. it uses tyrosine kinase inhibitors
b. it uses VEGF blocking antibodies
c. it causes mature blood vessels damage
d. it causes immature blood vessels damage
e. it is usually used in combination with chemotherapy
f. it usually has no side effects
g. it prevents the formation of new blood vessels in tumours
h. it causes the normalization of leaky walls of immature vessels

646. Disseminated tumour cells (DTC) in the bone marrow and lymph nodes:
a. can exist in a quiescent (dormant) state for many years
b. always lead to metastases
c. cannot stay in a dormant state
d. cannot escape from a dormant state
e. can be detected many years after completion of anticancer therapy
f. can escape from a dormant state
g. can be used for the prediction of outcome
h. could help to identify patients at risk for cancer relapse

647. Components of a tumour microenvironment include:
a. microbes
b. cytokines
c. tumour-associated fibroblasts
d. endothelial cells
e. tumor cells
f. tumour-associated macrophages
g. pericytes
h. cardiomyocytes

648. Immune system:
a. distinguishes between self molecules and foreign cancer molecules inside the body
b. can participate in tumour metastasis
c. often recognizes the tumour antigens as self molecules
d. the ability to kill cancer cells can decrease with ageing
e. has reduced ability to kill cancer cells in patients with depression
f. can have both tumour-protecting effect and tumour-promoting effect
g. can have only tumour-protecting effect
h. can have only tumour-promoting effect

649. Which statements regarding current oncology are correct:
a. almost 50% of adult cancer patients will be cured
b. approximately two-thirds of pediatric cancer patients will be cured
c. almost 80% of adult cancer patients will be cured
d. almost 90% of pediatric cancer patients will be cured
e. new molecules on cancer cells have been identified for targeted therapy
f. new molecules within cancer cells have been identified for targeted therapy
g. the number of newly diagnosed oncologic patients decreases annually

h. the number of newly diagnosed oncologic patients increases annually

650. Targeted therapy of malignancies:
a. uses antibiotics
b. uses monoclonal antibodies against growth factors
c. uses monoclonal antibodies against receptors
d. has a minimum of adverse effects
e. includes radiation therapy
f. uses tyrosine kinase inhibitors targeted to signal molecules
g. is expensive
h. has effects on targets on healthy tissues

651. In angiogenesis, participate:
a. endothelial cells
b. pericytes
c. osteoclasts
d. differentiated epithelial cells
e. macrophages
f. adipocytes
g. cardiomyocytes
h. Reed-Stenberg cells

652. Acute leukaemias result from:
a. malignant transformation of hematopoietic cells
b. abnormal proliferation of hematopoietic cells
c. the proliferation of differentiated hematopoietic cells
d. the proliferation of Reed-Sternberg cells
e. the proliferation of differentiated leukocytes
f. proliferation of platelets
g. proliferation of adipocytes
h. expansion of extracellular matrix in bone marrow

653. Acute leukaemias usually present with:
a. haemorrhage
b. anaemia
c. infection
d. infiltration of organs
e. bone metastasis
f. brain metastasis
g. liver metastasis
h. lung metastasis

654. Leukaemias are often manifested by:
a. weakness
b. fatigue
c. fever
d. infections
e. bleeding
f. bone pain
g. memory disorders
h. rigidity

655. Chronic leukaemia is characterized by neoplastic proliferation of:
a. mature granulocytes only
b. mature lymphocytes only
c. mature and immature lymphocytes
d. mature and immature granulocytes
e. immature lymphocytes only
f. immature granulocytes only
g. platelets
h. erythrocytes

656. Leukaemia cells can create infiltrates in:
a. CNS
b. mediastinum
c. gingiva
d. gonads
e. skin
f. heart
g. retina
h. muscles

Molecular pathogenesis

657. Genetic information is carried by:
a. nucleic acids
b. proteins
c. cells
d. RNA
e. DNA
f. amino acids
g. exons
h. organelles

658. Which statement is true for transcription:

a. it is a transcription of genetic information
b. it takes place in the cell nuclei
c. it takes place in the presence of polymerase
d. only exons are transcribed
e. introns are transcribed as well
f. it is not controlled by regulatory sequences
g. it is controlled by regulatory proteins
h. it takes place in the cytoplasm

659. Mark the statement that applies to the translation:

a. it is a protein synthesis
b. it is based on messenger RNA
c. it takes place in the cytoplasm
d. it runs in the nucleus
e. the granular endoplasmic reticulum is necessary for this process
f. the smooth endoplasmic reticulum is essential for translation
g. it is the breakdown of amino acids
h. it takes place only in lower eukaryotes

660. Which statement is true for the gene:

a. it contains genetic information
b. it is a segment of DNA
c. it is a segment of RNA
d. it is located on a chromosome
e. it contains information for the synthesis of amino acids
f. it contains information for the synthesis of polypeptides
g. duplication of genes takes place only in conditions of oxidative stress
h. alleles are structurally distinct parts of genes

661. Choose the correct statements:

a. a genotype is the set of all genes of an individual
b. a genotype is a set of half of all genes of an individual
c. a phenotype is the set of all external signs of an individual
d. the gene linkage is the common inheritance of 2 genes
e. the linkage group is a set of genes located on different chromosomes
f. the locus is the location of the gene in the chromosome
g. crossing-over is the exchange of genetic information between 2 bacteria
h. a heterozygote is an individual with an odd number of chromosomes

662. For the diagnosis of hereditary diseases, the following statements are true:

a. it is used in the diagnosis of hereditary monogenic diseases
b. it is not used in the diagnosis of hereditary monogenic diseases
c. markers are used for an indirect diagnosis
d. only markers that lie on the same chromosome as the pathological allele are used
e. only markers that do not lie on the same chromosome as the pathological allele are used
f. the examined marker must be in linkage to the desired loci
g. the marker cannot be in linkage to the desired loci
h. microsatellites are not used as markers

663. For monogenic diseases following statements are true:

a. their phenotype is determined by the genotype at two different loci
b. their phenotype is determined by the genotype at one locus
c. we recognize autosomal and gonosomal inheritance
d. dominant diseases are very rare in the population
e. dominant diseases are very common in the population
f. Huntington's chorea and cystic fibrosis belong to such diseases
g. dominantly inherited diseases include cystic fibrosis
h. with recessive inheritance, carriers of a dominant allele are affected

664. Select the correct arguments for mutation:

a. it involves a change in the genetic information
b. genomic mutations are more extensive than gene mutations
c. the term gene mutation is recognized for a change in the number of chromosomes
d. hypoploidy is redundancy of chromosome
e. hyperploidy does not belong to aneuploidy
f. chromosomal aberrations affect chromosome structure
g. the most serious of substitution mutations give rise to a stop codon
h. insertional mutations develop the duplication of the original section of the chain

665. Select correct statements for indirect DNA diagnostics:

a. the diagnosis itself proves the presence of gene mutation
b. various repetitive sequences are used as markers
c. markers are located in exons
d. markers near the gene are inherited together with this gene
e. the occurrence of a marker, not the gene itself, is being examined
f. it is used for the diagnosis of dominantly inherited diseases
g. the recombination is frequent between the marker and gene loci
h. heteroduplex analysis belongs to the indirect diagnosis

666. Select correct statements for Southern hybridization:

a. in most applications, restriction endonucleases are also used
b. restriction enzymes cleave DNA molecules in well-defined places
c. the same sequence fragments are of different molecular weight
d. restriction endonucleases cleave DNA molecules into fragments of equal length
e. in an electric field, DNA fragments move proportionally to molecular weight
f. the method can be used to identify the presence of mutations
g. this procedure cannot be used for the exact localization of mutations
h. the RNA probes that hybridize the DNA fragments are used

667. Select the correct statements on polymerase chain reaction:

a. the first reaction step is the denaturation of single-stranded DNA
b. to create a reaction mixture, restriction endonuclease is necessary
c. synthesis of DNA occurs at 72°C
d. a PCR reaction product is visualized by staining
e. primers are double-stranded sequences of oligonucleotides
f. f thermolabile DNA polymerase is used
g. primers hybridize to a single-stranded DNA based on complementarity
h. during each reaction cycle, the number of copies of a DNA fragment is doubled

668. Select the statements that apply to the oncogenetics:

a. cellular protooncogenes include the transducers and nuclear transcription factors
b. mutation in the regulatory protooncogenes causes the failure of cell division
c. proto-oncogene translocation in chromosomes causes the controlled transcription
d. tumor suppressor genes belong to the antioncogenes
e. to trigger the malignant process, deactivation of one of the antioncogene alleles is necessary
f. tumor suppressor genes behave as dominant genes from a genetic point of view
g. proto-oncogenes behave as recessive genes in the genetic terms
h. mutations in antioncogene may arise de novo in the germ cells, and they are not inherited

669. Select the statements that apply to the disease Duchenne muscular dystrophy:

a. it is a hereditary disease linked to gender
b. the most common type of dystrophin gene mutations are substitutions
c. it is a progressive disease of the muscular system
d. if the mother is carrying a mutated gene, daughters will be affected with a 50% probability
e. it is a disease with a recessive type of heredity
f. it is a disease with the autosomal dominant type of inheritance
g. the disease causes a defect in dystrophin synthesis
h. in this case of the hereditary disease, indirect DNA diagnosis cannot be used

670. Select the statements that apply for cystic fibrosis:

a. it is a rare autosomal recessive hereditary disorder
b. it is a disease caused by impaired CFTR protein
c. it is a disease caused by an impaired protein that functions as a chloride channel in the membrane of epithelial cells
d. prognosis is very optimistic
e. a high frequency of heterozygotes in the European population
f. the disease is linked to gender
g. in this type of hereditary disease, prenatal diagnosis is not possible
h. the relevant gene is located on the long arm of the 7^{th} chromosome

671. Select the statements that apply to spinal muscular atrophy:

a. a disease caused by the degeneration of spinal cord cells
b. a disease with autosomal recessive inheritance
c. a homogeneous group of diseases
d. a disease with autosomal dominant inheritance
e. a gender-linked non-hereditary disorder
f. a correlation between the type of gene mutations and disease severity is reported
g. extreme phenotypic variability is monitored in this disease
h. a regular accompaniment of the disease is mental retardation

672. Select the statements that apply to the syndrome of fragile-X chromosome:

a. a rare type of hereditary mental retardation
b. the sex-linked hereditary disease
c. the most common type of hereditary mental retardation
d. the gene responsible for the syndrome was identified on chromosome Y
e. a dominant disease with complete penetrance
f. a regular accompaniment of the syndrome is autism
g. the degree of mental retardation increases from generation to generation
h. a person carrying the relevant mutation may be phenotypically healthy

673. Select the statements that apply to the disease Huntington's chorea:

a. a gender-linked hereditary disorder
b. a neurological disorder with complete penetrance
c. a disease with autosomally dominant inheritance

d. in most cases, the disease manifestation begins during childhood
e. a disease with a recessive type of heredity
f. for this disease, prenatal diagnosis is not possible
g. disease caused by impaired protein synthesis, which is expressed in the brain
h. affected individuals are infertile

674. The following statements about the cell signalling pathways are corrected:
a. first messengers are receptors on the membrane
b. first messengers are receptor ligands
c. second messengers are receptor ligands
d. diacylglycerol and calcium belong to the second messengers
e. receptors are intracellular and extracellular
f. receptors are linked to transmembrane ligands
g. ligands bind to receptors, and they transmit a signal to second messengers
h. receptor ligands are always extracellular

675. Receptor ligands are divided into:
a. lipophilic and hydrophilic
b. hydrophobic and hydrophilic
c. hydrophobic and lipophilic
d. extracellular and intracellular
e. specific and nonspecific
f. associated with G-protein activation and inhibition
g. enzymatic and non-enzymatic
h. ligands and receptors

676. Intercellular communication can be:
a. endocrine
b. neurocrine
c. autocrine
d. paracrine
e. apocrine
f. exocrine
g. mesocrine
h. intracellular

677. Hormones:
a. are produced by exocrine glands
b. have specific receptors
c. bind to albumin or vectors, if they are not soluble in water
d. have not only endocrine but also paracrine effects
e. are subject to biological rhythms
f. are receptor ligands
g. are receptors for specific ligands
h. dimerize and enter the nucleus

678. Protein kinases include:
a. MAP kinase
b. insulin receptor
c. JAK
d. STAT
e. ERK
f. glucocorticoid receptor
g. renin
h. p53

679. The intracellular signalling pathways:
a. can be branched
b. are redundant
c. all affect the transcription of genes
d. begin by activating the receptor
e. are secure and free radicals
f. provide responses to external signals
g. are similar in different tissues
h. are activated by lipophilic ligands, hydrophilic do not get into the cytoplasm

680. Transcription factors:
a. are general and specific
b. affect the activity of RNA polymerase
c. affect the activity of DNA polymerase
d. are modified by protein kinases
e. bind to exons, not to introns
f. bind to introns, not to exons
g. are parts of the genes that regulate their expression
h. are located in the cytoplasm, and the nucleus

681. Response elements:
a. are parts of proteins that are important for their interaction with DNA
b. are parts of genes important for binding of transcription factors
c. are modified by protein kinases
d. are located in the cytoplasm, and the nucleus
e. modulate the activity of DNA polymerase
f. ensure the specific effect of transcription factors
g. are calcium, sodium and potassium

h. are always important in the hormone-regulated expression of genes

682. A cell can respond to a signal:
a. by the start of the cell cycle
b. by the cell cycle arrest
c. by apoptosis
d. by increased metabolism
e. by increased expression of certain genes
f. does not have to respond at all
g. by the genome change
h. by the change in the transcriptome

683. Steroid hormone receptors:
a. are the same for all steroids
b. are similar for all steroids
c. are derivatives of cholesterol
d. pass through the cytoplasmic membrane
e. have DNA-binding domain
f. recognize response elements
g. are transcription factors
h. are receptors and ligands

684. Electrophoresis:
a. is a method for the separation of proteins as well as nucleic acids
b. is a part of the Western blot method
c. uses chemical characteristics of saccharides for their identification
d. separates DNA upon its density
e. can be 2-dimensional up to 4-dimensional
f. can be a part of nucleic acids sequencing
g. is a method for identification of lipids

685. A specific protein can be identified from a mixture of proteins by:
a. its size
b. electrophoresis
c. mass spectrometry
d. polymerase chain reaction
e. sequencing
f. electron microscopy
g. antibodies
h. phagocytosis test

686. In an electric field, the nucleic acids:
a. move towards anode
b. move along electric current
c. move against electric current
d. the higher is molecular weight, the faster they move
e. conformation influences the speed of migration
f. from the negative electrode towards the positive electrode

687. Western blot:
a. was invented on the west coast of the USA
b. is being used for paternity analysis
c. is a method for DNA identification
d. is a method for protein identification
e. is used for confirmation of HIV positivity
f. enables the identification of antibodies

688. Gene therapy:
a. treats diseases by delivery of therapeutic nucleic acids into target cells
b. is a method for a paternity test
c. is used for the preparation of genetically modified crops
d. is forbidden in humans
e. can be somatic and germinal
f. uses only DNA to treat diseases
g. uses only RNA to treat diseases
h. uses viruses and bacteria

689. Vectors in gene therapy:
a. are harmful substances that rise from the preparation of pharmaceuticals
b. are of diverse chemical nature
c. can be saccharides, proteins and lipids
d. can be viral and bacterial
e. are always viruses
f. enable the patient to better cope with the disease
g. deliver genes into target cells
h. are always plasmids

690. Vectors in gene therapy include:
a. nanoparticles
b. plasmids
c. microorganisms
d. adenoviruses
e. salmonella

f. living and non-living systems
g. only viruses
h. lipid substances

691. Retroviruses:
a. are among DNA viruses
b. integrate into genome
c. are among the most used vectors in gene therapy
d. induce an inflammatory response immediately after they enter the organism
e. can activate oncogenes
f. are characterized by reverse entering of the original host organism
g. do not carry their own genes; they only use the host organism's genome

692. DNA vaccination:
a. is vaccination against foreign DNA
b. is among passive immunization strategies
c. induces production of antibodies against own DNA
d. is not based on activation of immune response
e. can be used for therapy of cancer
f. is used in the prevention of infectious diseases
g. is considered non-ethical

693. Synthesis of a new DNA molecule from the pre-existing one takes place in:
a. ribosomes
b. nucleus
c. mitochondria
d. cytoplasm
e. Golgi apparatus
f. each cell of the body
g. mainly in the M phase of the cell cycle
h. mainly in the S phase of the cell cycle

694. The term gene expression includes:
a. cell division
b. protein synthesis
c. intracellular signalization
d. DNA replication
e. mRNA synthesis in the cytoplasm
f. transcription
g. regular activity of ribosomes
h. posttranslational modification of proteins

695. DNA triplet CAT has the following counterparts in mRNA and tRNA, respectively:
a. CAT, CAT
b. GAA, CAT
c. GTA, CAU
d. GUA, CAU
e. CAU, GUA
f. CAT, GTA
g. GTA, GTA
h. GAU, CUA

696. Which of the following can regulate the activity of genes?
a. medicinals
b. steroid hormones
c. mental condition
d. folding and unfolding of DNA
e. proteins
f. promoters
g. enhancers

697. What was the main objective of the Human Genome Project?
a. large-scale production of important DNA sequences
b. to develop an ideal genetic code
c. to obtain a DNA fingerprint from every human being
d. to build a centre for therapy of hereditary diseases
e. to spread the idea of gene therapy among the lay population
f. to uncover the human genome sequence
g. to compare the length of genomes of various species

698. What is the number of genes in the human genome?
a. 80 000 – 120 000
b. 300 000 – 400 000
c. 5 000 – 15 000
d. 3 000 000 – 4 000 000
e. 15 000 000 – 25 000 000
f. 20 000 – 30 000
g. the same as the number of exons
h. many more than previously expected

699. Which statement is true for the human genome?
a. all cells of the body have exactly the same genetic load
b. the sequence is not known yet

c. the human genome sequence is more than 95% identical to the chimpanzee genome sequence
d. the real number of genes is lower than previously expected
e. the vast majority of the genome is made of non-coding and/or yet unknown function sequences
f. the vast majority of the genome is made of non-coding and/or yet unknown function sequences
g. it includes mobile elements such as transposons
h. retroviruses can integrate into the genome

700. Which statement is true for genetic polymorphism?
a. it is a naturally occurring DNA sequence variant
b. usually, it does not have a pathologic manifestation
c. polymorphism is a cause of cystic fibrosis
d. it never has an external manifestation
e. it can provide its carrier with an advantage over the majority of the population
f. usually, it causes a metabolic disorder
g. it always provides its carrier with an advantage over the majority of the population

701. Mark the statement that implies to exon:
a. it is a synonym for gene
b. it is localized outside the cell
c. it is a coding DNA localized outside the gene
d. number of exons in a gene is always one more than the number of introns
e. number of exons and introns in a gene is the same
f. it is a part of a gene that encodes information for a protein sequence
g. it is a non-coding part of the genome
h. it transcribes into mRNA sequence

702. Which element is, as a part of amino acid, sometimes being incorporated into the structure of a human protein in the process of translation?
a. calcium in calcitonin
b. mercury in mertiolate
c. phosphorus in phosphotyrosine
d. selenium in selenocysteine
e. iron in heme
f. copper in superoxide dismutase
g. zinc in catalase

703. Choose the correct statement for human somatic cells:
a. X-linked genes are missing in males
b. Y-linked genes are present in a single copy in females
c. X-linked genes are present in a single copy in females
d. the majority of genes are present in two copies
e. female cells have two copies of all genes
f. genes on Y-chromosome are present in two copies
g. X and Y chromosomes do not contain any homologous sequences

704. Which of the following is true for DNA?
a. it can be single-stranded as well as double-stranded
b. it is a carrier of genetic information in all known cellular organisms
c. amount of adenine is equal to the amount of guanine
d. the two strands within a DNA molecule are bound to each other via disulfide bonds
e. it is present in every cell of a human organism
f. DNA also has a catalytic activity
g. in the process of transcription, DNA transcribes into RNA with a homologous sequence

705. Which of the following belongs to the biological functions of proteins?
a. biologic catalysis
b. carrier of genetic information
c. transport of molecules within an organism
d. solvent for larger molecules
e. regulation of cellular processes
f. proteins are part of subcellular structures
g. proteins are part of chromatin
h. the energy source for cells

706. Which of the following enzymes lyses phosphodiester bonds?
a. kinase
b. phosphatase
c. lipase
d. nuclease
e. RNA polymerase
f. DNA polymerase
g. protease
h. glycosidase

707. Mark the methods that are used for DNA diagnostics:
a. DNA polymorphism analysis

b. polymerase chain reaction
c. chromatography
d. RFLP
e. spectroscopy
f. fluorometry
g. photometry
h. sequencing

708. Which of the following is NOT a monogenic disease?
a. Huntington's disease
b. acute myeloid leukaemia
c. chronic granulomatous disease
d. Hashimoto's thyroiditis
e. rheumatoid arthritis
f. cystic fibrosis
g. phenylketonuria
h. congenital adrenal hypertrophy

709. Mark the statement that is true for mutations:
a. they are changes in the DNA sequence that are always inherited
b. they are changes in secondary DNA structure
c. they are changes in the chromatin structure of various aetiology
d. they are changes in DNA sequence
e. they are caused by chemical, physical and biological factors
f. they are always transmitted to the next generation
g. they cause genetic diseases
h. they include translocation, transformation and transduction

710. Mark the correct statement for RNA:
a. it is an energy source for cells
b. it is a carrier of genetic information
c. in some species, it functions as a whole genome
d. it can have an enzymatic function as well
e. it is part of ribosomes
f. it is more stable than DNA
g. transcription into DNA is not possible in the cells
h. it contains uracil instead of adenine

711. Mutation:
a. is any change in DNA
b. is always transmitted to the next generation
c. is never transmitted to the next generation
d. always displays as a disorder on a cellular level
e. is the basis of monogenic diseases
f. is a change in primary DNA structure
g. unlike polymorphism, the mutation does not cause genetic diseases
h. is, for example, deletion, insertion, translocation

712. Polymerase chain reaction:
a. can be used in prenatal diagnostics
b. requires thermostable enzyme DNA polymerase
c. is a method based on atomic chain fissure
d. is a method of nuclear medicine
e. is not used in diagnostics
f. is a method for multiplying some region of DNA
g. is based on a cyclic change in reaction temperature
h. is not generally available because of its high price

713. A part of gene expression can be:
a. RNA interference
b. transversion
c. transformation
d. translation
e. splicing
f. DNA editing
g. RNA editing
h. posttranscriptional modification

714. Incomplete penetrance:
a. is a relation between allele recessiveness and dominance
b. is an insufficient amount of sperm during fertilization
c. is a situation when half of the gene carriers are at the same time carriers of its phenotype expression
d. is a situation when all of the gene carriers are at the same time carriers of its phenotype expression
e. is a situation when not all of the gene carriers are at the same time carriers of its phenotype expression
f. is a retention of hymen after the first sexual intercourse

715. Variable expressivity is:
a. a characteristic of dominance and recessiveness relation
b. variable clinical manifestation of a specific gene mutation
c. occurs when a phenotype is expressed in different conditions to a different qualitative degree among individuals with the same genotype

d. when a specific gene is expressed in different organs to a different degree
e. occurs when a phenotype is expressed in all conditions to the same degree among individuals with the same genotype
f. intermediate penetrance

716. The situations that lead to malignant process include:
a. proto-oncogene deactivation
b. tumor suppressor gene amplification
c. tumor suppressor gene mutation
d. proto-oncogene amplification
e. tumor suppressor gene activation
f. tumor suppressor gene deactivation
g. proto-oncogene mutation
h. cell cycle control activation

717. Proteomics:
a. is a science of unicellular organisms
b. is analogous to genomics, but on a protein level
c. is a global analysis of expressed proteins
d. is an analysis of tumour-expressed proteins
e. is restriction analysis of proteins
f. includes analysis of post-translationally modified proteins
g. is a complex analysis of polymorphisms
h. is the opposite of genomics

718. Which of the following is NOT among the hereditary forms of cancer?
a. hereditary nonpolyposis colorectal cancer (HNPCC)
b. malignant melanoma
c. colorectal carcinoma
d. familiar adenomatous polyposis
e. glioblastoma
f. some forms of breast and ovarian cancer
g. neurofibromatosis
h. prostate cancer

719. Which of the following is NOT among the monogenic diseases?
a. Duchenne's muscular dystrophy
b. Becker's muscular dystrophy
c. Huntington's disease
d. congenital adrenal hyperplasia
e. idiopathic lung fibrosis
f. albinism
g. haemophilia B
h. cystic fibrosis

720. What is the final number of copies of the original DNA after 5 cycles of a polymerase chain reaction if the original number of 2 DNA?
a. 128
b. 64
c. 10
d. 32
e. 5
f. 2.2^5
g. 16
h. 20

721. Which of the following processes do NOT take place in the cellular nucleus:
a. splicing
b. transcription from DNA to RNA
c. translation
d. reverse transcription
e. posttranslational modification
f. binding of polyA sequence
g. posttranscriptional modification
h. binding to ribosome

722. What is the chemical basis of DNA complementarity:
a. the bond between adenine and guanine
b. the bond between cytosine and guanine
c. hydrogen bonds
d. the bond between purine and pyrimidine
e. phosphodiester bond between the two strands
f. the covalent bond between the two strands
g. the bond between thymine and adenine
h. the bond between guanine and thymine

723. The molecular methods used in diagnostics include:
a. restriction analysis
b. polymerase chain reaction
c. sequencing
d. amniocentesis
e. flow cytometry
f. polymorphism analysis
g. western blot

h. hybridization

724. Which statement is true for genetic code:

a. it is the same in humans and Escherichia coli
b. all amino acids are encoded by multiple triplets
c. it is degenerate
d. it contains 64 different codons
e. each amino acid is encoded by a single triplet
f. contains 32 different codons
g. it is the basic principle that defines the sequence of amino acids in proteins
h. is inherited from both parents

725. Which statement is true for genome:

a. it is the same in humans and dogs
b. it is the same in all people
c. is unique for each individual
d. it is exactly the same in all cells of an organism
e. the size of the human haploid genome is around 3 billion base pairs
f. the human genome is the same size as the human proteome
g. the size of the human diploid genome is around 3 billion base pairs
h. it is a body of all genetic polymorphisms of the respective species

726. Complementarity of bases in nucleic acids is the basis of:

a. genetic code
b. posttranscriptional modifications
c. human genome size
d. DNA replication
e. diploidy
f. transcription
g. translation
h. cell division

727. Synthesis of a new DNA molecule from an existing one takes place:

a. in cytoplasm
b. can take place during sequencing
c. during transcription
d. during silencing
e. during enhancing
f. during DNA editing
g. if optimal conditions are present, in a tube
h. in mitochondria