

1. Arachidonic acid metabolites (derivates) are well known inflammation mediators. What enzyme will release arachidonic acid from cell membrane lipids?

+Phospholipase

Cyclooxygenase

Lipoxygenase

Adenylate cyclase

Myeloperoxidase

2. There's only one hormone among the neurohormones which is referred to the derivatives of amino acids according classification. Point out it:

+Melatonin

Thyroliberin

Vasopressin

Oxytocin

Somatotropin

3. The formation of a secondary mediator is obligatory in membrane-intracellular mechanism of hormone action. Point out the substance that is unable to be a secondary mediator:

+Glycerol

Diacylglycerol

Inositol-3,4,5-triphosphate

CAMP

Ca<sup>2+</sup>

4. Hypocalcemia can be caused by the violation of one hormone secretion. Point out this hormone:

+Parathyroid hormone

STH

ACTH

Thyroxin

Aldosterone

5. A 44-year-old woman complains of common weakness, heart pain, considerable increase of body weight. Objectively: moon-like face, hirsutism, AP- 165/100 mm Hg, height - 164 cm, weight - 103 kg; fat is mostly accumulated in the region of neck, upper shoulder girdle, stomach. What is the main pathogenetic mechanism of obesity?

Decreased production of glucagon

+Increased production of glucocorticoids

Increased production of mineralocorticoids

Increased production of insulin

Decreased production of thyroidal hormones

6. A 40-year-old patient complains of intensive heartbeats, sweating, nausea, visual impairment, arm tremor, hypertension. From his anamnesis: 2 years ago he was diagnosed with pheochromocytoma. Hyperproduction of what hormones causes the given pathology?

Aldosterone

+Catecholamines

Glucocorticoids

Thyroidal hormones

ACTH

7. Kidneys of a man under examination show increased resorption of calcium ions and decreased resorption of phosphate ions. What hormone causes this phenomenon?

Thyrocalcitonin

Vasopressin

+Hormonal form D3

Aldosterone

Parathormone

8. Secretion of which gastrointestinal hormones is primarily decreased in patient with removed duodenum?

+Cholecystokinin and secretin

Gastrin

Histamine

Gastrin and histamine

Neurotensin

9. A 19-year-old female suffers from tachycardia in rest condition, weight loss, excessive sweating, exophthalmos and irritability. What hormone would you expect to find elevated in her serum?

ACTH

Mineralocorticoids

Cortisol

Insulin

+Thyroxine

10. A 2-year-old child experienced convulsions because of lowering calcium ions concentration in the blood plasma. What organ function is decreased?

+Parathyroid glands

Hypophysis

Adrenal cortex

Pineal gland

Thymus

11. Increased production of thyroidal hormones T3 and T4, weight loss, tachycardia, psychic excitement and so on present on thyrotoxicosis. How do thyroidal hormones effect energy metabolism in the mitochondrion of cells?

+Uncouple oxidation and oxidative phosphorylation

Activates phosphorylation of substance

Stops phosphorylation of substance

Stops respiratory chain

Activates oxidative phosphorylation

12. Arterial hypertension is caused by the stenosis of the renal arteries in the patient. Activation of what system is the main link in the pathogenesis of this form of hypertension?

+Renin-angiotensin

Sympathoadrenal

Parasympathetic

Kallikrein-kinin

Hypothalamic-pituitary

13. Arterial hypertension, hyperglycemia, glucosuria were observed clinically for a long time in the patient with upper type of obesity. Death was due to the cerebral haemorrhage.

Basophilic hypophysis adenomas, hyperplasia of adrenal gland cortex were revealed on pathomorphological examination. What is the likely diagnosis?

+Cushing disease

Diabetes mellitus

Acromegaly

+Hypophysis nanism

Adiposogenitalis dystrophy

14. Patient was on glucocorticoids for a long time, discontinuation of usage caused exacerbation of the illness, decreased BP, weakness. How can you explain it?

+Insufficiency of adrenal glands

Adaptation to the medicine

Sensitization

Hyperproduction of ACTH

Cumulation

15. The person has decreased diuresis, hypernatremia, hypokalemia. Hypersecretion of what hormone can cause such changes?

+Aldosterone

Vasopressin

Auricular sodiumuretic factor

Adrenalin

Parathormone

16. Aspirin has antiinflammatory effect due to inhibition of the cyclooxygenase activity. Level of what biological active acids will decrease?

+Prostaglandins

Leucotriens

Catecholamines

Biogenic amines

Iodinethyronins

17. Periodic renal colic attacks are observed in the woman with primary hyperparathyroidism. Ultrasonic examination revealed small stones in the kidneys. What is the cause of the formation of these stones?

+Hypercalcemia

Hyperphosphatemia

Hypercholesterinemia

Hyperuricemia

Hyperkalemia

18. A 50-year-old patient complains of thirst, drinking of a lot of water, marked polyuria. Blood glucose is 4,8mmol/L, urine glucose and acetone bodies are absent, urine is colorless, specific gravity is 1,002-1,004. What is the cause of polyuria?

+Vasopressin insufficiency

Hypothyroidism

Insulin insufficiency

Aldosteronism

Thyrotoxicosis

19. The patient with complaints of permanent thirst applied to the doctor. Hyperglycemia, polyuria and increased concentration of 17-ketosteroids in the urine were revealed. What disease is the most probable?

+Steroid diabetes

Insulin-dependent diabetes mellitus

Myxoedema

Type I glycogenesis

Addison's disease

20. On some diseases it is observed aldosteronism with hypertension and edema due to sodium retention in the organism. What organ of the internal secretion is affected on aldosteronism?

Adrenal glands

Testicle

Ovaries

Pancreas

+Hypophysis

21. A patient with infectious mononucleosis had been taking glucocorticoids for two weeks. He was brought into remission, but he fell ill with acute attack of chronic tonsillitis. What action of glucocorticoids caused this complication?

Antiallergic

+Immunosuppressive

Antitoxic

Antishock

Anti-inflammatory

22. Some diseases reveal symptoms of aldosteronism with hypertension and edema due to sodium retention in the organism. What organ of the internal secretion is affected on aldosteronism?

Hypophysis

Testicle

Ovaries

Pancreas

+Adrenal glands

23. A 46 year-old patient has complained of headache, fatigue, thirst, pains in the spine and joints for the last 2 years. Clinically observed disproportional enlargement of hands, feet, nose, superciliary arches. He notes that he needed to buy bigger shoes three times. What is the main reason of such disproportional enlargement of different parts of the body?

Increased sensitivity of the tissues to growth hormone

Joints dystrophy development

Joints chronic inflammation development

Increased sensitivity of the tissues to insulin

+Cartilaginous tissue proliferation under growth hormone influence

24. A man after 1,5 liter blood loss has suddenly reduced diuresis. The increased secretion of what hormone caused such diuresis alteration?

+Vasopressin

Corticotropin

Cortisol

Parathormone

Natriuretic

There is only one hormone among the neurohormones which refers to the derivatives of amino acids according to classification. Point it out:

25. A 52 year-old patient with bronchial asthma was treated with glucocorticoids. Fever reaction appeared as a result of abscess formation after injection. The patient had subfebrile temperature, which didn't correspond to latitude and severity of inflammatory process. Why it was such low fever reaction?

+Inhibited endogen pyrogens production

Thermoregulation center inhibition

Violation of heat loss through lungs

Inflammatory barrier formation in injection place

Violation of heat-producing mechanisms

26. The formation of a secondary mediator is obligatory in membrane-intracellular mechanism of hormone action. Point out the substance that is unable to be a secondary messenger:

Diacylglycerol

+cAMP

Inositol-3,4,5-triphosphate

Ca<sup>2+</sup>

Glycerol

27. Under some diseases it is observed aldosteronism accompanied by hypertension and edema due to sodium retention in the organism. What organ of the internal secretion is affected under aldosteronism?

Ovaries

\*Adrenal glands

Testicle

Pancreas

Hypophysis

28. Intake of oral contraceptives containing sex hormones inhibits secretion of the hypophysal hormones. Secretion of which of the indicated hormones is inhibited while taking oral contraceptives with sex hormones?

Thyrotropic

\*Follicle-stimulating

Somatotropic

Oxytocin

Vasopressin

29. Thyrotoxicosis leads to increased production of thyroid hormones T3 and T4, weight loss, tachycardia, psychical excitement and so on. How do thyroid hormones affect energy metabolism in the mitochondria of cells?

Activate oxidative phosphorylation

+Disconnect oxidation and oxidative phosphorylation

Stop substrate phosphorylation

Activate substrate phosphorylation

Stop respiratory chain

30. Testosterone and its analogs increase the mass of skeletal muscles that allows using them for treatment of dystrophy. Due to interaction of the hormone with what cell substrate is this action caused?

Membrane receptors

Ribosomes

\*Nuclear receptors

Proteins-activators of transcription

Chromatin

31. The regulation of the water balance in organism is a function of:

\*Hypothalamus

Thalamus

Cerebellum

Medulla oblongata

Limbic system

32. Leukotrienes are a group of active substances derived from arachidonic acid by way of the lipoxygenase pathway in inflammation. Which is an INCORRECT in the following classic action of leukotriens?

Vasodilatation

Mediation of increased capillary permeability

\*Vasoconstriction

Chemotaxis

Bronchoconstriction

33. In addition to growth hormone, acromegaly is associated with an increased serum concentration of :

\*Insulin-like growth factor – 1 (IGF-1), somatomedin C

ACTH

FSH

Prolactin

TSH

34. Hypothyroidism is caused by all of the following EXCEPT:

Thyroid adenoma

Autoimmune causes

Surgery, radiation therapy, or both

Hereditary or developmental abnormalities

\*Iodine deficiency

35. Hypersecretion of ADH is associated with all of the following EXCEPT:

Diabetes insipidus

Water retention

\*Dilution hyponatremia

Inability to dilute urine

An increased blood output

36. All of the following characteristics are associated with somatotropic adenoma EXCEPT:

\*Inappropriate water retention

Gigantism

Hyperglycemia

Hypertension

Acromegaly

37. If a 19-year-old female was suffering from tachycardia in rest condition, weight loss excessive sweating, exophthalmos and irritability, which hormone would you expect to find elevated in her serum?

\*Thyroxine

Cortisol

Mineralocorticoids

ACTH

Insulin

38. Primary adrenocortical deficiency (Addison disease) is most frequently caused by:

\*Autoimmune mechanism

Histoplasmosis

Tuberculosis

Amyloidosis

Metastatic tumor

39. A benign tumor of adrenal glands causes hypersecretion of aldosterone is:

\*Conn's disease

Addison's disease

Cushing disease

Tetany

Hypertension

40. Which of the following is a characteristic of steroid hormones?

Activation of adenylate cyclase

Activation of protein kinases

Plasma membrane receptors

\*Stimulation of cellular protein synthesis

Termination of effects by phosphodiesterase

41. Patient with diabetes mellitus type I has made himself a dose of prolonged insulin intravenous infusion in order to decrease high glucose blood level. Hypoglycemic coma has developed. Choose the mechanism of hypoglycemia development?

\*tissues glucose increased consumption

increased glucose excretion from organism by urine

glucagon secretion inhibition

glucose interaction with insulin

inhibition of gluconeogenesis and ketogenesis in liver

42. At the patient 27 years old after the carried sepsis the bronze color of skin is appeared, which is typical for Addison's disease. Which hormone secretion is on the mechanism of hyperpigmentation?

\*Melanocyte stimulating hormone

Somatotropic

Gonadotropic

B-lipotropic

Thyrotropic

43. For a woman 46 years old after an operation on a thyroid gland a fibrillar twitchings of muscles of hands, feet and face of person appeared soon. These violations can be removed by introduction of

The triiodothyronine

\*Parathyroid hormone

Thyrotropin

Thyroxin

Thyrotropin releasing hormone

44. The patient with diabetes mellitus was delivered to a hospital in the state of unconsciousness. Kussmaul's breathing, arterial pressure 80/50 mm HG, with the smell of acetone from a mouth. The accumulation of what matters in the organism can explain the origin of these disorders?

Lactic acid

Modified lipoproteines

\*ketone bodies

Carbonic acid

Complex carbohydrates

45. For a patient the adenoma found out which takes a place from the cells of glomerular zone of adrenal cortex. A primary hyperaldosteronism or Conn's disease developed as a result of it. On the exchange of which ion does this hormone influence an?

Iron

Chlorine

Magnesium

Calcium

\*Sodium

46. Chronic insufficiency of adrenal cortex takes place for a patient (Addison's disease or bronze disease). Insufficiency of what hormone does take a place on this pathological process?

\*Aldosterone

Insulin

Adrenalin (Epinephrine)

Thyroxin

Vasopressin

47. In 1 – 2 days after a deletion of parathyroid gland on the dog is observed: a languor, thirst, sharp increase of nerve-muscular excitability with development of tetany. What violation of electrolytes exchange does take a place here?

Hypercalcemia

\*Hypocalcemia

Hypomagnemia

Hypermagnemia

Hyposodiumemia

48. A sick person 44 years old complain of a common weakness, increase of body mass, growth of hair on face, stop of menstruation, arterial pressure of 165/100 mm HG. What will help to differentiate Cushing's disease from the Cushing's syndrome?

A contents of 17 –  $\alpha$ -ketosteroids in urine

A level of cortisol in plasma

\*A level of corticotropin in blood plasma

Roentgenography (radiography) of the skull

An amount of eosinophil in blood

49. An obesity, hirsutism, "moon" face, purple scars on thigh skin were found in patient.

Arterial pressure 180/110 mm HG, blood glucose -17,2| mmol/l . At what changes in adrenal gland hormones production such picture is possible?

Hypoproduction of mineralocorticoids

Hypoproduction of glucocorticoids

Hyperproduction of mineralocorticoids

\*Hyperproduction of glucocorticoids

Hypoproduction of epinephrine

50. A sick person K., 35 years old complain on constant thirst, decreased appetite. The amount of drunked liquid is about 9 litres. A daily diuresis is increased; urine is bleached, relative density - 1005. The main possible reason of this pathology development in patient is damaging:

Basal membrane of glomerular capillary

Epithelium of kidney canaliculus

\*Anterior pituitary

Epiphysis

Hypothalamus nucleuses

51. A sick person, 46 years old, the nonproportional increasing in size of hands, feets, nose, ears, superciliary arcs and malar bones. In blood - hyperglycemia, disorder in glucose tolerance test. The main possible reason of this pathology development is|:

\*Hypersecretion of somatotropic hormone

Hypersecretion of all hormones of adenohipophis

Hyposecretion of insulin

Hyposecretion of vasopressin

Hypersecretionof glucocorticoids

For a 6 years old child the hyperergic form of inflammation of top respiratory tracts developed. The threat of serious violation of breathing appeared, and that is why there was a necessity to apply antiinflammation hormones. Among hormones a antiinflammation effect shows:

52. A 27 years old man appealed to the physician. At a examination was found out the increase of hand, feet and lower jaw. In addition there was deformation of joints (kiphosis), hormonal violations (impotence, atrophy of testicles). The functions of what gland is violate?

Corpus Pineale

Adrenal cortex

\*Anterior hypophysis

Thyroid gland

Parathyroid glands

53. As a result of injuring for a patient the parathyroid gland was deleted, that was accompanied: by a weakness, thirst, sharp increase of nervo-muscular excitability. With what matter exchange violation is it related:

Molybdenum

Manganese

Chlorine

\*Calcium

Zinc

54. A patient stings on enhanceable irritability, periodic subfebrile temperature. Frequency of pulse - 120 per minute. The amount of T3 and T4 hormones in blood is scaled-up. What endocrine pathology most logically suspected?

\*Hypothyroidism

Adrenal insufficiency

Hupoparathyroidism

Hyperparathyroidism

Hyperthyroidism

55. With the purpose to suppress theautoimmune reactions after transplantation of organs obligatory is a course of hormonotherapy. What hormones have to be applied from this purpose?

\*Glucocorticoids

Mineralocorticoids

Sex hormones

Adrenalin (Epinephrine)

Somatotropic hormone

56. For a patient with pneumonia there was a fever. What directly does cause the change of adjusting point of temperature in the neurons of hypothalamus of this patient?

Endotoksin

\*Prostaglandins PGÅ1, PGÅ2

Exotoxin

Interleukin-2

Thrombocyte growth factor

57. In laboratory animal by the intravenous injection of alloxone the experimental diabetes mellitus was evoked. What is the mechanism of this substance action?

Formation of antibodies to insulin

Binding of Zinc

\*The  $\beta$ -cells of pancreatic islands damaging

Activation of insulinase

Activation of contrinsulin hormones formation

58. A 53 years old woman has a 163 sm height, a bodyweight is 92 kg, deposition of fat is even, a person face is puffy, not mobile and apathetical. There is a fossula at pressure of skin of leg. What gland parafunction is the cause of illness?

Gonads

Hypophysis

Adrenal gland

\*Thyroid

Parathyroid

59. A patient on the early stage of diabetes mellitus has polyuria. What is the cause of it?

\*Hyperglycemia

Ketonemia

Hypocholesterolemia

Hypercholesterolemia

Hyperkalemia

60. A patient 48 years old has a hypertension, head pain, muscular weakness, convulsions. In blood the concentration of  $K^+$  is decreased and the concentration of  $Na^+$  is increased, which is the result of hypersecretion of:

Adrenalin

\*Aldosterone

Parathyroid hormone

Cortisol

Dihydrocholesterol

61. At the simulation of inflammation of lower extremity in animal the temperature of body rise, the content of antibodies and leucocytes was increased in blood. What matters did stimulate development of these common reactions of organism at inflammation?

Leukotrienes

Glyucocorticoids

Mineralocorticoids

\*Interleukins

Somatomedins

62. For a woman with primary hyperparathyroidism periodically the attacks of nephrocolic repeat. An ultrasound inspection rotined the presence of small stones in kidney. What is the most probable reason of its formation?

Hyperkalemia

Hyperphosphatemia  
Hypercholesterolemia  
Hyperurikemia  
\*Hypercalcemia

63. A 38 years old woman grumbles about a general weakness, pain in the heart area, increase of appetite, absence of menstruations. Objectively: height is about 166 sm, bodyweight 108 kg, a "moon like" face, deposition of subcutaneous adipose tissue mainly in the high limb area, trunk; on the skin of thighs, stomach bloody- red stripes, pulse of 62 per minute, AP-160/105 mm HG. All this states are most characteristic for:

Myxoedema  
Alimentary obesity  
\*Cushing's disease

Insulinoma  
Babinskiy-Frelikh syndrome

64. A 26 years old woman complaint about a present general weakness, loss of body mass on 18 kg, absence of menstruations, is ill already 1 year, after confinement; she had a difficult confinement, accompanied by bleeding. Objectively: 168 sm height, bodyweight 53 kg, hypoplasia of mammary glands. The syndrome of Shikhena is diagnosed. What is the basic mechanism of loss of weight for a woman?

Hypothyroidism  
Decline of gonads function  
Decline of adrenal cortex function  
\*Decreased production of adenohipophysis hormones

hypoparathyroidism

65. In patient under investigation revealed hirsutism, "moon like" face, on the skin of thighs, stomach bloody- red stripes. Arterial blood pressure is 190/100 mm HG, glucosemia - 17,6 mmol/l. In what of indicated pathology types this picture appears?

\*Hyperfunction of adrenal cortex

Hyperthyroidism  
Hypothyroidism  
Hypofunction of gonads  
Hyperfunction of insulin

66. In patient determined presence of hyperglycemia, polyuria, hyperstenuria and glucoseuria. For what form of metabolism pathology this combination typical?

Kidney diabetes  
\*Diabetes mellitus  
Diabetes insipidus  
Glycogenosis  
Diencefalon obesity

67. Patient 18 years old, after the carried rubeola (german measles) began to lose of weight, constantly felt dryness in a mouth, thirst, appetite is increased, frequent urination began. Objectively: daily amount of urine - 6 litres, glucosemia - 17 mmol/l, glucose and acetone are found in urine. What disease did arise up for a patient?

Secondary diabetes mellitus  
Symptomatic diabetes mellitus  
\*<sup>2</sup>nsulin depended diabetes mellitus  
<sup>2</sup>nsulin inepended diabetes mellitus

Steroid diabetes

68. The woman 23 years old entered to hospital with a diagnosis acute pneumonia. She fall ill sharply, 2 days back, when a chill with a fever to 39°C, weakness, dry cough appeared. What from the enumerated neurohumors of inflammation has endogenous pyrogen characteristics?

Serotonin

Thromboxane A2

Histamin

\*Interleukin 1

Bradykinin

69. Woman 55 years old, which lives in mountain locality, an endemic goitre is diagnosed.

Objectively: a bit enhanceable wellnourishment, slow down, apathetical, increase of thyroid gland size. The deficiency of what element can cause it?

Sodium

Fluorine

Manganese

Molybdenum

\*Iodine

70. An endemic goiter is diagnosed in boy. What is the basic mechanism of hypothyroidism development at boy?

\*Decreased production of thyroxine and triiodothyronine

Decline production of thyrotropin

Decline sensitivity of tissues receptors to thyroxine and triiodothyronine

Increased metabolism of thyroxine and triiodothyronine

Violation of thyroxine and triiodothyronine transport

71. A man 46 years old, who suffered on diffuse toxic goitre, an operation of thyroid gland resection was conducted. After an operation an absence of appetite, dyspepsia, increased neuromuscular excitability are marked. Mass of body was not increased. The temperature of body is normal. What from transferred below the state of man is conditioned?

Decline production of thyroxine

\*Decline production of parathormone

Increased production of calcitonine

Increased producyion of thyroliberin

Violation of thyroxine production

72. Man of 42 years old, which suffers on an top type obesity (high limb area, a "moon like" face), AP is 160/95mm HG, glucose of blood - 8.0 mmol/l. The level of cortisol contents in blood is enhanced, but adrenocorticotropin level is reduced. What most reliable cause of hypercorticoidism development?

Diminishing of statins production

Hormonprodusing tumour of anterior pituitary

\*Hormonprodusing tumour of adrenal cortex

Increase of corticoliberin production

Diminishing of sex hormones production

73. For a patient with diabetes mellitus the processes of regeneration are reduced, wounds do not heal over long. With what changes in the metabolism is this related?

Diminishing of glucose entering to the cells

By the accumulation of ketone bodies

Acidosis

\*Depression of proteins synthesis

Violation of lipids metabolism

74. With the purpose of prevention of seizure of transplanted organ after transplantation obligatory course of endocrinotherapy is conducted with the purpose of immunosuppression. What hormones can be used?

Thyroid

Mineralocorticoids

Sex hormones

Catecholamines

\*Glucocorticoids

75. By the method of nondirect calorimetry it was identified, that basic metabolism of the person is on 40 % below to necessary. Violation of what gland activity can be assumed?

\*Thyroid glands

Thymus

Pancreas

Epiphysis

Parathyroid gland

76. At 50 years old person after the carried infectious disease of cerebrum a diuresis was significantly increased to 12 l/day. At a blood test a glucose level was 4,1 mmol/l. What hormone deficiency is the cause of it?

Glucogon

\*Vasopressin

Insulin

Cortisol

Aldosteron

77. Clinically was observed, what under pregnancy the gravity of rheumatoid arthritis symptoms sharply decreased. Acceleration of what hormones secretion with antiinflammatory action can be present on this case?

Thyroid gland hormones

Estrogens

\*Glucocorticoids

Catecholamines

Gonadotropins

78. A woman 29 years old grumbles about a general weakness, loss of body mass on 22 kg, amenorrhea. It is ill after births. Objectively: growth - 162 sm, body mass - 46 kg, hypoplasia of mammary glands. A hypophysial cachexy is diagnosed. What hormone production diminishing was most substantial in get thin?

Melanotropin

Adrenocorticotropin

Thyreotropin

\*Somatotropin

Prolaktotropin

79. In the emergency department a unconscious patient is delivered with the smell of acetone from an oral cavity. The methods of express-analysis expose glucose in blood - 17,3 mmol/l. The increase of what matters maintenance did result in the loss of consciousness?

Glucose

Lactic acid

\*ketone bodies

Fat acids

Urea

80. For a patient it is set stable fervescence, excess heart beating, emotional lability, tremor. With what hormon production changing is this state connected?

Aldosterone

Vasopressin

Testosteron

\*Thyroxine

Insulin

81. One of dangerous moments in pathogenesis of myocardium necrosis there is subsequent growth of necrosis areas, dystrophy and ischemia. A important role here is in belongs to the increase of oxygen consumption by myocardium. What matters are assist in this process?

\*Catecholamines

Acetylcholin

Adenozin  
Cholesterol  
Chlorine ions

82. The woman 44 years old grumbles about a general weakness, pain in the area of heart, considerable increase of body mass. Objectively: a person with a pulse of 100/min, BP is 165/100 mm HG, growth is 164 mm, weight is 103 kg, mainly accumulation of fat on a neck, high limb area, stomach. What is the basic pathogenic mechanism of obesity for a woman?

Increase of insulin products  
Decline of thyroid gland hormones production  
\*Increased glucocorticoids production  
Decline of glucagon production  
Increase of mineralocorticoids production

83. A patient with the lungs inflammation has a high temperature. What bioactive matter does play a leading role in the origin of this display?

Serotonin  
Histamin  
Bradykinin  
\*Interleukin-I

Leukotrienes  
84. After a stroke (cerebral thrombosis) with the defeat of hypothalamus nucleus a patient had diabetes insipidus. What did become reason of increased urine formation for this patient?

Acceleration of glomerular filtration  
Diminishing of sodium reabsorption  
Decline of arterial pressure  
Hyperglycaemia  
\*Diminishing of water reabsorption

85. For a patient with the inflammatory process of skin and hypoderm with chronic course found out predominance of proliferation processes. The deficiency of what hormone can result it?

\*Cortison  
Aldosterone  
Insulin  
Somatotrophic hormone  
Thyroxin

86. A patient 50 years old grumbles about thirst, drinks much water, polyuria is expressed. Blood glucose - 4,8 mmol/l, in urine glucose and acetone are absent, urine is colourless, relative gravity 1,002-1,004. What reason of polyuria?

Hypothyroidism  
\*Deficiency ADH  
Insulin insufficiency  
Aldosteronism  
Thyrotoxicosis

87. At patient 39 years old ovary concerning malignant tumours were removed. In 2 years later a hirsutism appeared, voice is coarsen, a physique build get masculine (male) signs. What from hormonal changes is underlay on given pathology?

Strengthening of prolactin production  
Absence of progesteron  
\*Decrease of estrogens  
Decline of androgens production  
Hypofunction of adrenal cortex

88. For a patient with cirrhosis of liver a hypertension, muscular weakness, periodic cramps appeared. In blood –  $\text{Na}^+$  content is increased and  $\text{K}^+$  content is decreased. What from diminished types of endocrine violations underlay this symptomocomplex?

Hyperpituitarism

Hypopituitarism

Primary aldosteronism

\*Secondary aldosteronism

Hypoaldosteronism

89. For mice with the inherited obesity a hyperglycemia and lowering of insulin receptors amount in lipocytes is established. What pathogenic mechanism is primary in strengthening of lipogenesis for these animals?

\*Hyperinsulinemia

Hypoinsulinism

Hypertrophy of lipocytes

A decline tolerance to glucose

Increase deposition of fats

90. Patient a 16 years old, who suffer on Cushing's disease, was consulted about excess body weigh. At questioning elucidated, that energetic value of consumed food is 1700-1900 kkal/day. What is the primary reason of obesity in this case?

Deficiency of insulin

Excess glucocorticoids production

\*Excess of insulin

Deficiency of glucocorticoids

Hypodinamia

91. A hypertension for a patient is dependent on stenosis of kidney arteries. Activation of what system is a main link in pathogenesis of this form of hypertension?

Parasympathic system

Sympato-adrenal system

\*Renin-angiotensin system

Hypothalamo-hypophyseal

Calicrein-kinin system

92. A patient with chronic heart insufficiency have edemata of lower extremities. Extra activation of what system is the main link of this pathology?

Parasympathic

Hypothalamo-hypophyseal

Sympatho-adrenalal

\*Renin-angiotensin-aldosterone system

Calicrein-kinin system

93. For a patient what receive the prolonged course of glucocorticoids treatment, found out ulcers in a stomach. What mechanism is main in their development?

Decline of parasympathic nervous system tone

A decline of Histamin in the mucus shell of stomach

Increase of sympathetic nervous system tone

Increase of prostaglandin E1, E2 production

\*Increase of secretion and acidity of gastric juice

94. For a patient with a hemorrhage in the posterior hypophysis there was polyuria and diminishing of vasopressin level in blood. What is the main mechanism of polyuria development in this case?

\*Diminish of water reabsorption in kidney canaliculus

An increase of water filtration in glomerulis

An increase of sodium reabsorption in canaliculus

Diminishing of sodium reabsorption in canaliculus

Increase of potassium excretion

95. The prolonged use of mineralocorticoids resulted in appearance of muscular weakness in the patient. What is underlay on pathogenesis of this phenomenon?

\*Hyperkalemia

Hypokalemia

Hypernatremia

Hyponatremia

Hypervolemia

96. A patient appealed to the physician with complaints on pain in a head, changes in extremities, increase of hands and feet size. Objective: massive superciliary arcs, lips. At surplus of what hormone such symptoms appear.

Thyroid hormone

Adrenocorticotrophic hormone

\*Somatotrophic hormone

Glucocorticoids

Adrenalin

97. Patient K., 45 years old enter to endocrinological department with complications on pain in a head, thirst, nikturia, periodical attack of cramps, increase of arterial pressure. About 6 monthes ago the diagnosis of primary aldosteronism was delivered (Conn's disease).

Hyperfunction of what hormones cause this pathology?

Adrenocorticotrophic hormone

Catecholamines

Glucocorticoids

\*Aldosteron

Thyroid gland hormones

98. Patient Í., 25 years old, after carried infection a diabetes insipidus developeo. Deficiency of what hormone lead to this pathology formation?

Vasopressin

Aldosteron

Cortisol

Renin

\*Insulin

99. Patient D., 50 has a diagnosis "Myxedema". Disorder of what hormones formation can lead to this pathology development?

Cortisol and aldosterone

\*Tyroxine and triiodothyronin

ACTH and STH

Oxitocin and vasopressin

Insulin and glucogon

100. For a girl an adrenogenital syndrome is diagnosed (pseudhermafroditism). Surplus secretion of what hormone of adrenal cortex did stipulate this pathology?

Adrenalin

Estrogen

Aldosterone

Cortisol

\*Androgens

1. Patient with carcinoma has the insufficiency of vitamin B5, serotonin concentration at blood is extremely increased. What is the reason of this state?

Infringement of serotonin metabolism in organism

+Tryptophan mainly turns in serotonin

Alimentary deficiency of vitamin PP

Increased use of vitamin PP

Serotonin promotes reduction of vitamin PP in an organism

2. After epileptic attack the baby was examined by the pediatricist, baby is given artificial meal. Dermatitis was also diagnosed. After laboratory tests the decrease of alanin - and aspartataminotransferase level activity of erythrocytes was detected. What vitamin insufficiency can be detected?

Cobalamin

Ascorbic acid

+Pyridoxine

Riboflavin

Calciferol

3. During obstructive jaundice deficiency of prothrombin is often registered. Deficiency of what vitamin is it connected with?

E

B6

A

D

+K

4. The symptoms of rickets at child (4 month). Digestion disturbance are not registered. The child spends much time outdoors (sun bathes). During 2 months the child received vitamin D3, however rickets symptoms have not decreased. What is the possible explain of rickets development at this child?

Infringement of calcitriol synthesis+

Infringement of calcitonin synthesis

+Infringement of parathormon synthesis

Infringement of thyroxin synthesis

Infringement of insulin synthesis

5. Treatment of some infectious diseases which are caused by bacteria is based on, sulfanilamide medicines, these medicines block synthesis of the growth factor of bacteria.

Choose the mechanism of sulfanilamide's medicines:

Inhibition of absorption of folic acid

+these drugs are antivitamin of paraaminobenzoic acid

inhibitor of same enzymes

these drugs take part in oxidoreduction reactions

these drugs are allosteric enzymes of paraaminobenzoic acid

6. On reception to the doctor the patient with symmetric dermatitis of open sites of skin has come. From patient's story it is established that he eats, basically, cereals and few meat, milk and eggs. Deficiency of which vitamin is principally detected?

Folic acid

Calciferol

+Nicotinamide

Biotin

Tokoferol

7. Carrot, pumpkin and other red vegetables contain carotin. Deficiency of what vitamin is supplied with these vegetative pigments?

Tokoferol

Naftohinon  
Riboflavin  
+Retinol  
Calciferol

8. Avitaminosis of what vitamin can significantly decrease the aminotransferesis activity in blood serum?

B9, folic acid  
B1 thiamin  
B2 riboflavin  
B5 nicotinic acid  
+b6 pyridoxine

9. A woman for a long time is on a diet with cleared rice, polyneuritis (illness beriberi) was diagnosed. What vitamin insufficiency at food leads to development of this disease?

+Thiamin  
Ascorbic acid  
Pyridoxine  
Folic acid  
Riboflavin

10. Patient has disturbance in calcium absorption processes in intestine after removal of gall bladder. What vitamin will stimulate this process?

PP  
+D3  
C  
B12  
K

11. The symptoms of beriberi are present at the patient. Activity of what enzyme is broken at the patient?

Malate dehydrogenase  
Citrate synthetase  
+Pyruvate dehydrogenase  
Succinate dehydrogenase  
Fumarase

12. At the patient with frequent bleedings from internal organs and mucous membrane, proline and lysine as a part of collagen's fibers are found out. What vitamin absence causes hydroxylation of proline and lysine?

Thymine  
B1  
A  
+C  
E

13. At the patient, which accepts anticoagulants of indirect action, decrease of prothrombin level from 0,15 g/l to 0,05 g/l is detected. Prothrombin takes part in the second phase of blood clotting - formation of thrombin. It has taken place as a result of:

Decrease of quantity of globulin of blood  
Deficiency of vitamin B12  
Deficiency of vitamin C

Decrease of concentration of Ca ++  
+Deficiency of vitamin K

14. Increased concentration of pyruvate is detected at the patient's blood and urine. What avitaminosis is observed at the patient?

+Avitaminosis B1  
Avitaminosis E  
Avitaminosis B3  
Avitaminosis B6  
Avitaminosis B2

15. Anticoagulant pelentan was prescribed to the patient with thromboembolic illness. What vitamin antagonist is this compound?

Vitamin C  
Vitamin E  
Vitamin A  
Vitamin D  
+Vitamin K

16. At patient a night blindness ( nyctalopia) is detected. What of the low listed substances will have medical effect?

Karnitin  
Keratin  
Kreatin  
+b Carotene  
Karnozin

17. The patient complains on general weakness and bleeding from gums. What vitamin lack can cause such state?

Vitamin A  
Vitamin E  
+Vitamin C  
Vitamin H  
Vitamina D

18. During child (age of 11 months) examination by pediatricist, bended bones of the low limbs and retardment of bones mineralization of skull were found. What vitamin lack leads to the pathology?

Thiamin  
+Cholecalciferol  
Pantothenic acid  
Bioflavonoid  
Riboflavin

19. During treatment of inflammatory process (Infectious process) by antibiotics, infringement of blood clotting at patient emerged, as a result of suppression of intestines microflora. Insufficiency of what vitamin is detected at the patient?

+K  
B1  
D  
C  
B12

20. The patient has symptoms of diarrhoea, dementia and dermatitis as a result of wrong diet. Lack what of vitamin causes these state?

- Vitamin B1
- +Vitamin pp
- Vitamin B2
- Vitamin C
- Vitamin B12

21. The patient suffers from pernicious anemia. The patient eats normally. One month ago he had operation on a stomach. What is reason of the anaemia?

- Deficiency of folic acid in food
- Deficiency of vitamin C
- Deficiency of vitamin PP in food
- Deficiency of proteins in food
- +Deficiency intrinsic factor Castle

22. During routine inspection of a child the retardment of a bones mineralization was revealed. What vitamin lack could serve the reason of this?

- Folic acid
- Riboflavin
- Tocopherol
- +Calciferol
- Cyanocobalamine

23. Hydroxyproline is the important amino acid in the structure of collagen. Which vitamin does help in formation of this amino acid by hydroxylation of proline?

- B2
- D
- B1
- +C
- B6

24. During enterobiosis structural analogue of vitamin B2- acrichine is used. What enzymes synthesis infringement at microorganisms causes this medicines?

- Peptidase
- Cytochrome oxidase
- +FAD- dependent dehydrogenase
- NAD - dependent dehydrogenase
- Aminotransferase

25. The 10 year-girl is often affected respiratory infections. After respiratory infections plural hemorrhage dot in places of a friction of clothes are observed. Specify what hypovitaminosis has taken place at the girl.

- B6
- +c
- B1
- And
- B2

26. Vitamin therapy was prescribed to the pregnant woman who had some spontaneous abortions in the anamnesis. Specify vitamin, which promotes carrying of a pregnancy.

Folic acid  
+@-tocopherol  
Cyanocobalamine  
Pyridoxin  
Rutin

27. At the child (6 month) frequent and strong hypodermic bleedings were observed. An appointment of synthetic analogue of vitamin K (vicasol) has given positive effect. This vitamin takes part in carboxylation of glutamate in molecules of blood factor (coagulation proteins). Specify this protein?

Antihemophilic globulin, factor VIII  
fibrinogen  
The factor of Hageman  
+Prothrombin, factor II  
Rosenthal's factor

28. At patients, with obturation of the general bile duct, hemorrhages arise, which are connected with bad absorption of vitamin:

E  
+k  
K  
D  
F

29. Patient suffers from diarrhoea, dementia and dermatitis. At the anamnesis is known that the basic foodstuff of the patient is corn. These infringements are connected with bad mastering of vitamin:

Vitamin B1  
+Vitamin pp  
vitamin B2  
vitamin B9  
vitamin B8

30. The oculist has found out increase of adaptation time of an eye to the darkness at patient. What vitamin insufficiency can cause such symptoms?

Vitamin C  
Vitamin E  
+Vitamin A  
Vitamin K  
Vitamin D

31. The patient complained on the general weakness and bleeding from gums. What vitamin insufficiency can it be at patient?

Vitamin B1  
Vitamin E  
Vitamin PP  
Vitamin D  
+Vitamin C

32. Durind examination of the patient diarrhoea, dementia and dermatitis are diagnosed. Specify absence of what vitamin is the cause of this state.

Ascorbic acid

+Niacin  
Folic acid  
Biotin  
Rutin

33. The megaloblastic anemia is diagnosed at the patient. Specify the substance which insufficiency can cause the development of this illness.

Cholecalciferol  
Glycine  
Copper  
+Cyanocobalamin  
Magnesium

34. At patient, with frequent bleedings in to visceral organs and mucous membranes, in the structure of collagen fibers proline and lysine were found out. Absence of what vitamin causes such infringement of hydroxylation of this amino acid?

Vitamin E  
+Vitamin C  
Vitamin K  
Vitamin A  
Vitamin D

35. According with clinical symptoms pyridoxalphosphate was prescribed to the patient. For what processes correction this medicine is recommended?

+Transamination and decarboxylation of amino acids  
Oxidative decarboxylation of keto acid  
Deamination of amino acids  
Synthesis purine and pyrimidine bases  
Synthesis of proteins

36. Dermatitis has appeared at patient after eating raw (unboiled) eggs. What avitaminosis has emerged?

Avitaminosis of folic acid  
+Avitaminosis of biotin  
Avitaminosis of pantothenic acid  
Avitaminosis of paraaminobenzoic acid  
Avitaminosis of inositol

37. A pyruvate concentration is increased at the patient's blood. The much pyruvate is excreted via urine. What avitaminosis is observed at the patient?

avitaminosis of vitamin B6  
avitaminosis of vitamin E  
avitaminosis of vitamin B3  
+avitaminosis of vitamin B1  
avitaminosis of vitamin B2

38. The patient has symptoms of pellagra. During interrogation it became known that throughout long time he ate mainly corn and little meat. What became the cause of pellagra ?

Deficiency proline in corn  
Deficiency tyrosin in corn  
+Deficiency tryptophan in corn  
Deficiency alanine in corn

Deficiency histidine in corn

39. During various diseases level of active forms of oxygen increases extremely that leads to destruction of cellular membranes. For prevention of it antioxidants are used. Strong natural antioxidant is:

Glucose

+α-tocopherol

Vitamin D

Fatty acids

Glycerine

40. The newborn child has symptoms of hemorrhagic illnesses which connected with vitamin K hypovitaminosis. This disease is caused by inhibition of the vitamin K biological role, which:

inhibits synthesis of heparin

Is cofactor of prothrombin, factor II

Is specific inhibitor of antithrombin

Influences on proteolytic activity of thrombin

+Is cofactor α-glutamyl - carboxylase

41. Morbidity along large nervous trunks and the raised pyruvate level in blood is found out at the patient. What vitamin insufficiency can cause such changes?

PP

B2

+b1

Pantothenic acid

Biotin

42. Most participants of Magellan expedition to America died from avitaminosis. This disease debuted with general weakness, subcutaneous hemorrhages, falling of teeth, gingival hemorrhages. What is the name of this avitaminosis?

Biermer's anemia

Pellagra

Rachitis

Polyneuritis (beriberi)

+Scurvy

43. While examining the child, doctor found symmetric cheeks roughness, diarrhea and disfunction of the nervous system. Lack of what food components caused it?

Threonine, pantothenic acid

Methionine, lipoic acid

Lysine, ascorbic acid

+Nicotinic acid, tryptophane

Phenylalanine, pangamic acid

44. It is known that the collagen molecule contains amino acids (oxyproline, oxylysine). Which one of the listed low substances takes part in hydroxylation of proline and lysine during synthesis?

Asparaginic acid

Folic acid

Pantothenic acid

Glutamic acid

+Ascorbic acid

45. At the newborn spasms are registered, they've disappeared after appointment of vitamin B6. This effect is most possibly caused by the fact that vitamin B6 takes part in formation of:

histamine

non-essential amino acids

heme

+gamma-amino butyric acid (GABA)

Nicotinamide

46. At the young man 20 years old macrocytic anaemia has emerged, increased level of methyl malonic acid is registered in urine. It is first of all caused by deficiency of:

Pantothenic acid

Nicotinic acid

+Cyanocobalamin

Ascorbic acid

Biotin

47. The gerontology institute advises to old people to use a complex of vitamins which contains vitamin E. What main function does it carry out?

Antiscorbutic function

Antihemorrhagic function

+Antioxidant function

Antineuritic function

Antidermatitic function

48. After a course of therapy the doctor offers to the patient with an ulcer of a duodenum to use cabbage and potato juices. What substances in this food promotes preventive maintenance and healing of ulcers?

Pantothenic acid

+Vitamin U

Vitamin C

Vitamin B1

Vitamin K

49. The doctor advises to use half-cooked liver in ratio of the patient during treatment of pernicious anemia. What vitamin presence in this product will have medical effect?

+Vitamin b12

Vitamin B1

Vitamin B2

Vitamin C

Vitamin H

50. At the man who did not received fats with meal for a long time, but received enough of carbohydrates and proteins, dermatitis, bad healing of wounds, sight deterioration are found out. What is the cause of metabolism infringement?

A lack of palmitic acid

+A lack of linoleic acid, vitamins A, D, E, K

A lack of vitamins PP, H

Low caloric content of diet

A lack of oleic acid

51. People, who suffers from alcoholism, receive main part of calories with alcoholic beverages. They can have a characteristic insufficiency of thiamine (a syndrome of Wernicke), which causes a nervous system functions infringement, psychoses, memory loss. With what enzyme activity inhibition is it connected?

Transaminase

Alcohol dehydrogenase

+Pyruvate dehydrogenase

Aldolase

Hexokinase

52. Treatment of the child who suffers from rickets with vitamin D did not give positive results. What is the most plausible reason of treatment inefficiency?

Raised use of vitamin D by microflora of intestines

Insufficiency of lipids in meal

Infringement of vitamin D inclusion to enzyme

+Infringement of vitamin D hydroxylation

Infringement of vitamin D transport by blood proteins

53. At person who suffers from alcoholism, hypovitaminosis B1 is often observed, which is the reason of diet infringements. Symptoms of B1 hypovitaminosis are the nervous system frustration, psychoses, memory loss. Why cells of a nervous tissue are especially sensitive to vitamin B1 deficiency?

Decreases intensity of glycolysis

Amplifies lipolysis in adipose tissue

Oxidation of fatty acids is broken

Intensity of glycolysis is raises

+Infringement of glucose aerobic oxidation

54. After treatment with antibiotics as a result - fringement of intestine microflora is possible with development of hypovitaminosis:

D

C

A

p

+b12

55. For treatment of malignant tumours methotrexate (structural analogue of Folic acid) is prescribed which is the competitive inhibitor of dehydrofolatreductase and consequently suppresses synthesis of:

Glycerophosphates

Monosaccharides

Fatty acids

+Nucleotides

Glycogen

56. Vitamin A in a complex with specific cytoceptors penetrates through a nuclear membrane and induces transcription processes, which stimulate the growth and differentiation of cells. This biological function is realised through the following form of vitamin A:

Retinol

Tranc-retinal

Cis-retinal

+Trans-retinoic acid

Carotene

57. Malignant macrocytic anaemia – Biermer disease – is a result of vitamin B12 lack. What microelement is a part of this vitamin?

Zinc

Molybdenum

+Cobalt

Iron

Magnesium

58. During parodontosis treatment an antioxidant of a natural and artificial origin is used. Specify, what of natural compounds is used as antioxidant?

Gluconate

Thiamine

+Tocopherol

Pyridoxine

Choline

59. At patients, with impassability of bile-excreting ducts, infringement of blood coagulation bleedings emerge which are the consequence of wrong metabolism of vitamin:

A

K

D

+k

Carotene

60. At the patient such changes are registered: sight infringement in dark, dryness of conjunctiva and cornea. Such infringements can emerge because of deficiency of:

Vitamin B

+Vitamin A

Vitamin C

Vitamin D

Vitamin B12

61. After resection of 2/3 of stomach erythrocytes quantity has decreased in blood, erythrocytes volume has increased, haemoglobin level has decreased. Deficiency of what vitamin leads to such changes in blood?

PP

C

P

B6

+b12

62. At what hypovitaminosis simultaneous infringement of reproductive function and a dystrophy of skeletal muscles are observed?

+Vitamin e

Vitamin A

Vitamin K

Vitamin D

Vitamin B1

63. At the patient of 37 years after a long application of antibiotics, raised hemorrhagic bleeding from small damages is observed. At blood – decrease in activity of blood coagulation factors II, VII, X, lengthening of blood coagulation time. Deficiency of what vitamin has caused such changes?

- Vitamin C
- Vitamin A
- +Vitamin K
- Vitamin D
- Vitamin E

64. At the patient of 36 years old who suffers from chronic alcoholism, accumulation of pyruvate is registered in blood, in erythrocytes – transketolase activity is decreased. What coenzymes form of the vitamin which insufficiency causes noted changes?

- Pyridoxal phosphate
- Carboxybiotin
- Methyl cobalamin
- +Thiamine pyrophosphate
- Tetrahydrofolate

65. At the 43-years-old patient the megaloblastic hyperchromic anaemia is observed, atrophic chronic gastritis. Methylmalonyl in urine is raising. Insufficiency of what vitamin has caused occurrence of these symptoms?

- +Vitamin b12
- Vitamin B2
- Vitamin B3
- Vitamin B5
- Vitamin B1

66. For diagnostics of some diseases, aminotransferase activity is researched in blood. What vitamin is a coenzyme of these enzymes?

- +b6
- B2
- b1
- B9
- B5

67. At the child of 2 years after a long antibiotic therapy the dysbacteriosis has developed: almost total absence of Escherichia coli. Insufficiency of which group vitamins can emerge in connection with a dysbacteriosis?

- B
- b+
- C
- E
- D

68. At the patient frequent bleedings from internal organs and mucous membranes are observed. The analysis has defined insufficiency of hydroxyproline and hydroxylysine as a part of collagenic fibres. Lack of what vitamin does bring disturbance in the process of hydroxylation of these aminoacids?

- Vitamin K
- Vitamin A
- Vitamin H

+Vitamin C  
Vitamin PP

69. The oxidative decarboxylation of  $\alpha$ -ketoglutarate is broken because of vitamin B1 deficiency. Synthesis of what coenzyme is broken?

Nicotinamide adenine dinucleotide (NAD)

+Thiamine pyrophosphate (TPP)

Flavine adenine dinucleotide (FAD)

Lipoic acid (LA)

E.Coenzyme A

70. According to clinical symptoms, pyridoxalphosphate was prescribed to the patient. For correction of what processes this medicine is recommended?

Deamination of purine nucleotides

Oxidative decarboxylation of keto-acid

+Transamination and decarboxylation of amino acids

Synthesis of purine and pyrimidine nucleotides

Synthesis of proteins

71. Hypovitaminosis of vitamin C leads to reduction of organic matrix formation, to infringement of collagen synthesis because this vitamin takes part in processes of:

Proline carboxylation

+Proline hydroxylation

Lysine carboxylation

Arginine hydroxylation

Tryptophan hydroxylation.

72. Gingival hemorrhage has sharply emerged to the patient. What vitamins should be prescribed to this patient?

C, K

B1, B2

+C;K

pp, B12

Biotin, pantothenic acid

73. The peripheral blood smear of a severely anemic patient reveals oval macrocytes (color index = 1,5) hypersegmented neutrophils and decreased platelets. Simultaneously he had severe lifelong achylic gastritis. The most likely anemia is:

+Megaloblastic B12- folate deficiency anemia

Aplastic anemia

Iron deficiency

Thalassemia major

Sickle cell anemia

74. If there is insufficiency of thiamine - vitamin B1, bery-bery desiasse (polyneuritis) and carbohydrate metabolism disorder occurs. What metabolite accumulates in blood during these processes?

Malate

Lactate

Succinate

Citrate

+Pyruvate

75. Patient with hypochromic anemia has splitting hair and loss of hair, increased nail brittling and taste alteration. What is the mechanism of these symptoms development?

- Deficiency of iron-containing enzymes
- Deficiency of vitamin B12
- Decreased production of parathyroid hormones
- Deficiency of vitamin A
- Decreased production of thyroid hormones.

76. Increased vessels, enamel and dentine destruction at scurvy patients are caused by disorder of collagen maturing. What stage of procollagen modification is damaged during this avitaminosis?

- +Hydroxylation of proline
- Formation of polypeptide chains
- Glycosylation of hydroxylysine residues
- Removal of C-ended peptide from procollagen
- Detaching of N-ended peptide.

77. Concentration of pyruvate is increased in the patient's blood, the most of which is excreted with urine. What avitaminosis is observed in the patient?

- +Avitaminosis b1
- Avitaminosis E
- Avitaminosis B3
- Avitaminosis B6
- Avitaminosis B2

78. There is an inhibited coagulation in the patients with bile ducts obstruction, bleeding due to the low level of absorption of a vitamin. What vitamin is in deficiency?

- K
- +k
- D
- A
- Carotene

79. Pyruvate concentration in the patient's urine has increased 10 times from normal amount. What vitamin deficiency can be the reason of this change:

- Vitamin B6
- Vitamin A
- Vitamin E
- Vitamin C
- +Vitamin B1

80. Hydroxylation of endogenous substrates and xenobiotics requires a donor of protons. Which of the following vitamins can play this role?

- +Vitamin C
- Vitamin E
- Vitamin P
- Vitamin A
- Vitamin B6.

81. A 2-year-old child has got intestinal dysbacteriosis, which results in hemorrhagic syndrome. What is the most likely cause of hemorrhage of the child?

Activation of tissue thromboplastin  
PP hypovitaminosis  
Fibrinogen deficiency  
+Vitamin K insufficiency  
Hypocalcemia.

82. In case of enterobiosis acridine - the structural analogue of vitamin B2 - is administered. What enzymes synthesis disorder does this medicine cause in microorganisms?  
NAD-dependet dehydrogenases  
Cytochrome oxidases  
+FAD-dependent dehydrogenases  
Peptidases  
Aminotransferases.

83. Patients with bile ducts obstruction suffer from inhibition of blood coagulation, bleedings as a result of low level of vitamin assimilation. What vitamin is in deficiency?  
D  
Carotene  
K  
+k  
E

84. A patient who was previously ill with mastectomy as a result of breast cancer was prescribed radiation therapy. What vitamin preparation has marked radioprotective action caused by antioxidant activity?  
Ergocalciferol  
Thiamine chloride  
+Tocopherol acetate  
Folic acid  
Riboflavin

85. The role of the majority of water-soluble vitamins is due to their ability to form a cofactor of enzyme. Name the vitamin that is unable to carry out this function:  
+Ascorbic acid  
Nicotinamide  
Riboflavin  
Biotin  
Adenosine triphosphate

86. Name the enzyme class, whose structure often contains vitamin PP (its derivatives NAD or NADP):  
+Oxidoreductases  
Hydrolases  
Ligases  
Isomerases  
Lyases

87. There is the osteoporosis in the patient with chronic renal failure. What vitamin's metabolism infringement promotes this disorder?  
+Vitamin D  
Vitamin E  
Vitamin A

## Vitamin K

1. Decreased concentration of the glucose leads to the increased secretion of:

Serotonin  
Acetylcholine  
Histamine  
+Adrenalin  
Dopamine

2. The utilization of glucose by cells is promoted by...

Glucagon  
+Insulin  
Adrenalin  
Thyroxin  
Somatotropin

3. The patient with the symptoms of acute alcoholic poisoning was brought in clinic. Which changes of carbohydrates metabolism are typical for this condition?

The anaerobic breakage of glucose is increased in muscles  
The gluconeogenesis is increased in liver  
The breakage of glycogen is increased in liver  
The anaerobic glucose metabolism predominates in muscles  
+The speed of gluconeogenesis in liver is decreased

4. A 7-year-old girl has signs of anemia. Laboratory examination revealed pyruvate kinase deficiency in erythrocytes. What process disturbance plays the main role in anemia development?

+Peroxide decomposition  
Anaerobic glycolysis  
Tissue respiration  
Aminoacids deamination  
Oxidative phosphorylation

5. The loss of consciousness and cramp occur with the patient who suffers on diabetes mellitus after the insulin injection. What result can give a biochemical blood test on sugar maintenance?

5,5 mmol/l  
8,0 mmol/l  
10,0 mmol/l  
3,3 mmol/l  
+1,5 mmol/l

6. A patient with diabetes mellitus has been delivered in hospital in the state of unconsciousness. Arterial pressure is low. The patient has acidosis. Point substances, which accumulation in the blood results in these manifestations:

High fatty acids  
Monosaccharides  
Amino acids  
+Ketone bodies  
Cholesterol esters

7. Buffer capacity of blood was decreased in the worker due to exhausting muscular work. Entry of what acid substances to the blood can explained this state?

Pyruvate  
1,3-bisphosphoglycerate  
+Lactate  
Alpha-ketoglutarate  
3-phosphoglycerate

8. A patient with the symptoms of acute alcoholic poisoning was brought to the hospital. What carbohydrates metabolism changes are typical for this condition?

The gluconeogenesis is increased in liver  
The anaerobic glucose metabolism predominates in muscles  
+The gluconeogenesis velocity in liver is decreased  
The breakage of glycogen is increased in liver  
The anaerobic breakage of glucose is increased in muscles

9. Galactosemia has been revealed in a child. Concentration of glucose in the blood has not considerably changed. What enzyme deficiency caused this illness?

Galactokinase  
Phosphoglucomutase  
+Galactose-1-phosphate uridylyltransferase  
Hexokinase  
Amylo-1,6-glucosidase

10. The gluconeogenesis is activated in the liver after intensive physical trainings. What substance is utilized in gluconeogenesis first of all in this case:

Glutamate  
Lactate  
Alanine  
Glucose  
+Pyruvate

11. A worker has decreased buffer capacity of blood due to exhausting muscular work. The influx of what acid substance in the blood can cause this symptom?

3-phosphoglycerate  
1,3-bisphosphoglycerate  
+Lactate  
alfa-ketoglutarate  
Pyruvate

12. A patient with diabetes mellitus experienced loss of consciousness and convulsions after injection of insulin. What is the result of biochemical blood analysis for concentration of the sugar?

10,0 mmol/L  
3,3 mmol/L  
8,0 mmol/L  
5,5 mmol/L  
+1,5 mmol/L

13. Microsomal oxidation is the universal biological system of the oxidation of the non-polar compounds (many drugs, toxic compounds), steroid hormones, and cholesterol. Indicate name of cytochrome, which takes part in the microsomal oxidation.

Cytochrome aa3  
+Cytochrome P 450

Cytochrome b  
Cytochrome c  
Cytochrome c1

14. A 30-year-old woman was diagnosed with insufficiency of exocrine function of pancreas. Hydrolysis of what nutrients will be disturbed?

Proteins, fats  
Proteins, carbohydrates  
Fats, carbohydrates  
+Proteins, fats, carbohydrates  
Proteins

15. Analysis of the blood and urine of patient with diabetes mellitus confirmed the hyperglycemia and glucosuria. What available value of glucose concentration in the blood plasma in the patient:

2,54 mmol/l  
3,88 mmol/l  
4,89 mmol/l  
6,55 mmol/l  
+9,32 mmol/l

16. Glucose may be transformed into glucose-6-phosphate due to the action of various enzymes in human tissues. Indicate the liver enzyme for this conversion:

Galactokinase  
Hexokinase  
Fructokinase  
+Glucokinase  
Phosphofructokinase

17. The glucose-1-phosphate molecules are successfully formed during the process of glycogenolysis in the muscular tissue. Indicate the energy effect (per 1 mol of glucose-1-phosphate) of its further transformation into lactate:

2 ATP  
+3 ATP  
36 ATP  
38 ATP  
22 ATP

18. The second stage of aerobic oxidation of glucose in a cell is the oxidative decarboxylation of pyruvate. Name the main product of this process:

Citrate  
Glutamate  
+Acetyl-CoA  
Oxaloacetate  
Succinyl-CoA

19. A patient who has been strictly keeping to a certain diet for 10 days went through examination of respiratory coefficient. It was determined that it was 1. What diet have the patient been keeping to?

Mixed  
With domination of proteins and carbohydrates  
With domination of proteins and fat

+With domination of carbohydrates  
With domination of fat and carbohydrates

20. Avidin is the strong specific inhibitor of biotine-depended enzymes. What from the stated below reactions will be blocked under avidin adding?

Glucose – Pyruvate  
+Pyruvate – Oxaloacetate  
Oxaloacetate – Glucose  
Glucose – riboso-5-phosphate  
Lactate – Pyruvate

21. A patient is in the hypoglycemic coma state. Indicate the overdose of what hormone can result such situation.

Corticotropin  
Progesteron  
Cortisol  
Somatotropin  
+Insulin

22. For a sick woman with a low arterial blood pressure after parenteral hormone introduction the increase of arterial blood pressure happens and also the level of glucose and lipids was risen in the blood. What hormone was introduced?

Insulin  
Glucagon  
+Adrenalin  
Progesteron  
Folliculin

23. At the lack of blood circulation in the period of intensive muscular work in a muscle as a result of anaerobic glycolysis the lactic acid is accumulated. What is subsequent fate of it?

Utilized by tissues for the ketone bodies synthesis  
Excreted through kidneys with urine  
Used for the glucose synthesis in a muscle  
+Included in a gluconeogenesis in a liver  
Used in tissues for the fatty acids synthesis

24. Under blood analysis for a patient the expressed hypoglucosemia is discovered on an empty stomach. It appeared at liver biopsy investigation, that there is any glycogen synthesis in the liver cells. Insufficiency of what enzyme is the reason of this disease?

Phosphorylase  
+Glycogen synthase  
Fructosodiphosphotase  
Pyruvatecarboxylase  
Aldolase

25. Complete oxidation of glucose molecule and it's coupling with phosphorylation is equivalent to the following total amount of ATP molecules formation:

52  
8  
12  
+38  
58

26. An one-year child falls behind in mental development from the yearlings. In the morning: vomiting, cramps, loss of consciousness. In blood – hypoglycemia on an empty stomach. With what enzyme defect is it related to?

Phosphorylase  
+Glycogensynthase  
Arginase  
Sucrase  
Lactase

27. As a result of exhausting muscular work for a worker the buffer capacity of blood significantly diminished. What compound entering to the blood is it possible to explain this phenomenon?

1,3- biphosphoglycerate  
Pyruvate  
+Lactate  
alfa- ketoglutarate  
3- phosphoglycerate

28. Sick X. a first-aid brought. The state is heavy, consciousness absent, absence of movement. Skin covers are dry, hollow eyes. Cyanosis of person. Tachycardia. A smell of acetone is from a mouth. Results of analyses: blood glucose - 20,1 mmol/l (N= 3,3-5,5 mmol/l), in urine 3,5% (in N=0). What is conceivable diagnosis?

Hypoglycemic coma  
+Hyperglycemic coma  
Acute cardiac insufficiency  
Sharp alcoholic poisoning  
Anaphylactic shock

29. A glycogen which entered with a meal is hydrolyzed in gastrointestinal tract. What final product did appear as a result of this process?

Galactase  
Lactate  
Lactase  
+Glucose  
Fructose

30. For a patient with diabetes mellitus after the injection of insulin the loss of consciousness, cramp came. What result can give a biochemical blood test on sugar maintenance?

10,0 mmol/l  
8,0 mmol/l  
+1,5 mmol/l  
3,3 mmol/l  
5,5 mmol/l

31. At a sprint the untrained man has a muscular hypoxia. What metabolite accumulation it leads in muscles?

Oxaloacetate  
Ketone bodies  
Acetylc-CoA  
Glucose-6-phosphate  
+Lactate

32. Plenty of glucose oxidation metabolites are situated in the cytoplasm of myocytes. Name one of them that directly converted into lactate.

Glucose-6-phosphate

Oxaloacetate

Glycerophosphate

+Pyruvate

Fruktose-6-phosphate

33. At a long-distance race the skeletal musculature of the trained man utilizes glucose with the purpose of receipt of ATP energy for muscular contraction. Indicate the basic process of glucose utilization in these conditions.

Anaerobic glycolysis

+Aerobic glycolysis

Glycogenolysis

Gluconeogenesis

Glycogenesis

34. There is alfa-amylase, capable to cleave nutritive in saliva. What substrates can act on this enzyme?

Nucleoproteins

Lipids

Simple proteins

+Carbohydrates

Chromoproteins

35. For a patient with constant hypoglycemia a blood test after introduction of adrenalin did not change substantially. A physician assumed violation in a liver. About what change of liver function can we speak?

Ketogenic

Cholesterol formation function

+Glycogen deposit function

Glycolytic

Excretory

36. At glucose transformation in the pentose cycle a phosphates of different monosaccharides synthesized. What from these matters can be used for nucleic acids synthesis?

Eritroso-4-phosphate

Ribuloso-5-phosphate

+Riboso- 5-phosphate

Sedogeptuloso-7-phosphate

Eksiluloso-5-phosphate

37. The characteristic sign of glycogen storage disease is pain in muscles during physical work. What enzyme inborn insufficiency is predetermines this pathology?

Glycogen synthase

Glucose-6-phosphotase

+Glycogen phosphorylase

Amylo-1,6-glycosidase

Lysosomal glycosidase

38. Sick L., 46 years old, complains of dryness in a mouth, thirst, frequent urination, common weakness. At a biochemical analysis found out a hyperglycaemia, hyperketonemia. In urine -glucose, ketone bodies. On an electrocardiogram - diffuse changes are in myocardium. What diagnosis is possible for a sick?

+Diabetes mellitus

Alimentary hyperglycaemia

Acute pancreatitis

Diabetes insipidus

Ischemic heart trouble

39. After transfer to the mixed nourishment a new-born child had dyspepsia with diarrhea, flatulence, and lag in development. Insufficiency of what substance is biochemical basis of this pathology?

Cellulases

+Lactase and cellobiose

Trypsin and chymotrypsin

Lipases and kreatinkinase

Saccharase and isomaltase

40. A 3-years-old child with the enhanced temperature of body after the reception of aspirin has increased hemolysis of RBC. What inborn enzyme insufficiency could cause hemolytic anaemia for a child?

Glycogen phosphorylase

Glucose-6-phosphatase

+Glucose-6-phosphate dehydrogenase

Glycerolphosphate dehydrogenase

gamma-glutamyl transferase

41. In adjustment of enzymes activity an important place belongs to their postsynthetic covalent modification. What from the noted mechanisms is adjusting of glycogen phosphorylase and glycogen synthase activity carried out?

Metylation

+Phosphorylation-dephosphorylation

Adenyle addition

Limited proteolysis

ADP-ribosylation

42. After the intensive physical training for a sportsman a gluconeogenesis is activated. What is the basic substrate for this process?

Serine

Aspartic acid

Glutamic acid

alfa-ketoglutarate

+Lactate

43. For a 6-years-old child physical activity is decreased, there are signs of movement coordination violation. The genetic defect of pyruvate-dehydrogenase complex is detected. What laboratory indexes decided in the ground of diagnosis?

Alanine is higher of norm

Alanine is below of norm

Pyruvate is below of norm

+Pyruvate is higher of norm

Lactate is below of norm

44. A concentration of glucose in plasma of blood of healthy man is in such limits:

2-4 mmol/l

+3,5-5,5 mmol /l

10-25 mmol/l

6-9,5 mmol/l

1-2 mmol/l

45. In 8- monthly child there is vomiting and diarrhea after fruit juices reception. Loading fructose resulted in hypoglycemia. Indicate the inherited insufficiency of what enzyme is reason of the state of child.

Hexokinase

Fructokinase

+Fructose -1- phosphate aldolase

Phosphofructokinase

Fructose-1,6-diphosphatase

46. For the 34-years-old patient a decreased endurance to the physical trainings takes a place while in skeletal muscles maintenance of glycogen is enhanced. By what enzyme activity decline is it related to?

Glycogen synthase

Glucose-6-phosphate dehydrogenase

Phosphofructokinase

+Glycogen phosphorylase

Glucose-6-phosphatase

47. For a child with the point genes mutation absence of glucose-6-phosphatase, hypoglycemia and hepatomegalia found out. Define the type of pathology which these signs are characteristic for.

Cori's disease

+Von Gierke's diasese

Addison's diasese

Parkinson's diasese

Mc-Ardl's diasese

48. A patient is delivered to medical establishment in the comatose state. According to accompanying it was find out, that a patient lost consciousness during training on the finishing stage of marathon distance. What type of coma it is more probable to suspect?

Hepatic

Hyperclycemic

Acidosis

Hypothyroid

+Hypoglycemic

49. A new-born child after feeding with milk had dyspepsia, vomit. At feeding with glucose solution these phenomenon disappeared. Indicate an enzyme, which takes part in carbohydratess digestion, insufficient activity of which results in these disorders.

Saccharase

Amylase

+Lactase

Isomaltase

## Maltase

50. During a run on short distance the untrained people have muscular pain as a result of lactate accumulation. Indicate, with strengthening of what biochemical process can it be related to.

Lipogenesis

Gluconeogenesis

Pentose phosphate pathway

+Glycolysis

Glycogen formation

1. The activity of which of the following enzymes is directly affected by citrate?

+Phosphofructokinase I

Isocitrate dehydrogenase

Fructose-2,6-bisphosphatase

Pyruvate carboxylase

6-phosphogluconate dehydrogenase

2. Work of the heart muscle requires energy. Specify which substrate is the main source of energy for running muscles?

Amino acids

Fatty acids

Lactic acid

+Pyruvate

alpha- ketoglutaric acid

3. It was established that death of 20-year-old women resulted from cyanide poisoning. What process disorder caused the death?

Hb synthesis

Oxidative phosphorylation

Urea synthesis

+Tissue respiration

Oxygen transport by Hb

4. Nucleoside triphosphates belong to high-energy bonds containing compounds. Point out the quantity of high-energy bonds in their structure:

0

1

+3

2

4

5. The malate and the salicylic acid (uncoupler) were added to the mitochondrion suspension of rats' liver that was incubated in aerobic condition at the optimal temperature and pH. Point out the P/O ratio for the malate oxidation in this situation:

3

+2

0

1

4

6. Choose the right continuation of the phrase: "Tissue respiration in hypoxia state..."

Is activated

Increases the rate of course

+Reduces the rate of course

Is not changed

Supplies more energy for synthetic ways

7. Thyrotoxicosis leads to increased production of thyroidal hormones T3 and T4, weight loss, tachycardia, and psychic excitement and so on. How do thyroidal hormones effect energy metabolism in the mitochondrion of cells?

Stop respiratory chain

Activate oxidative phosphorylation

Stop substrate phosphorylation

Activate substrate phosphorylation

+Disconnect oxidation and oxidative phosphorylation

8. The experimental animal was given a cytochrome oxidase blocker, which led to its instant death. Which of the given substances can cause these changes?

B .Potassium nitrite

Potassium sulfate

+Potassium cyanide

Potassium oxalate

Potassium phosphate

9. The patient with thyroid hyperfunction has high body temperature (fever). What is the main infringement of the energy exchange in rising of temperature during this?

Increase of the lipolysis

The increase of glycogen breakdown

+Uncouple of oxidation and oxidative phosphorylation

Enzymes activation in the Krebs cycle

Activation of respiratory chain's enzymes

10. Patients with thyrotoxicosis have the increase of the body temperature due to:

Increase of uptake of oxygen in the body

+Increases of activity of biological oxidation, disconnecting of processes (uncouple) of oxidation and phosphorylation

Increase of thermogenesis in the liver

The constriction of peripheral vessels

Activation of protein's catabolism

11. Lipoic acid was excluded from diet of the experimental animals, and during this process the inhibition of their pyruvate dehydrogenase complex was observed. What is lipoic acid for this enzyme?

Allosteric regulator

Substrate

Inhibitor

+Coenzyme

Product

12. The biological oxidation and deactivation (detoxication) of xenobiotics are realized by hemcontaining enzymes. Which metal is a required component of these enzymes?

Mg

Zn

Co  
+Fe  
Mn

13. Patients with the thyrotoxicosis have hyperthermia, bulimia, lose of weight due to the violation of:

Reactions of  $\beta$ -oxidation of fatty acids

The breakdown of ATP

Reactions of synthesis of fat

Reactions of citric acid cycle

+The coupling of oxidation and phosphorylation

14. Cyanides are extremely powerful cell's poison which can cause death of the human body. Which enzyme blocking in tissue respiration is basic in this action?

Catalase

Superoxide dismutase

+Cytochrome oxidase

Hemoglobin reductase

Glucose-6-phosphatdehydrogenase

15. Weight loss and increased body temperature are observed during increasing function of the thyroid gland. What biochemical processes are activating during this?

Gluconeogenesis

Anabolism

+Catabolism

Lipogenesis

Steroidogenesis

16. Disposal (Deactivation) of pathogenic bacteria and splitting (breakdown) alien bodies in leukocytes are carried out with the help of which type of oxidation reaction:

+Peroxidation reaction

Oxydase reaction

Oxygenase reaction

Peroxidase reaction

Anaerobic reaction

17. A worker of the chemical company was brought to the hospital with signs of poisoning. Arsenate of the high concentration was found in the hair of the woman, which blocks the lipoic acid. Specify a dysfunction of what process is the main reason of poisoning:

Deactivation of super oxide ions

Microsomal oxidation

reduction of methemoglobin

reduction of organic peroxides

+Oxidative decarboxylation of pyruvate

18. How does thyroxin influence on the processes of tissue respiration and oxidative phosphorylation of a patient who is ill with thyrotoxicosis?

+Uncouples the process of tissue respiration and oxidative phosphorylation

Blocks electron transport on the cytochrome's chain

Activates hydrolysis of ATP

Decrease activity of FAD-dehydrogenase

Decrease activity of NAD-dehydrogenase

19. How many molecules of ATP can be synthesized after full oxidation of acetyl-CoA in Citric acid cycle?

- 1
- +12
- 5
- 8
- 3

20. The central intermediate substance of all metabolisms (proteins, lipids, carbohydrates) is:

- Lactate
- Succinil-CoA
- Oxaloacetic acid
- +Acetyl-CoA
- Citrate

21. The process of ATP synthesis, which goes according to the reactions of oxidation with the participation of mitochondrial respiratory enzymes, is called:

- +Oxidative phosphorylation
- Substrate phosphorylation
- Free oxidation
- Photosynthetic phosphorylation
- Peroxidation

22. At necropsy of a 40 year-old woman the legal expert found that death occurred as a result of poisoning with cyanides. Blocking of which process is the most probable with the cyanides in this state?

- +Cytochrome oxidase
- Glycogen phosphorylase
- Pyruvate carboxylase
- Succinate dehydrogenase
- Glucose-6- phosphate dehydrogenase

23. During the pathological processes, accompanied by hypoxia, take place the incomplete reduction of oxygen molecules in respiratory chain and the accumulation of hydrogen peroxide. Specify the enzyme, which catalyze its destruction.

- Aconitase
- Cytochrome oxidase
- Peroxidase
- Ketoglutarate dehydrogenase
- +Catalase

24. Macroergic compounds are necessary for the normal metabolism in the cells. Which of these components belongs to the macroergic compounds?

- Creatinine
- Creatine
- +Phosphocreatine
- Glucose-6-phosphate
- Adenosine monophosphate

25. Potassium cyanide is a poison death of the body comes instantly. Name of the enzyme in mitochondria on which cyanic potassium can influence (affect) is:

Cytochrome b5  
Flavinic enzymes  
+Cytochrome oxidase [aa3]  
NAD - dependent dehydrogenase  
Cytochrome P-450

26. For a woman the symptoms of diabetes are absent 45 years, but on an empty stomach enhanceable maintenance of glucose is determined in blood (7,5 mmol/l). What next test must be conducted?

+Determination of tolerance is to glucose  
Determination of acetone bodies is in urine  
Determination of remaining nitrogen is in blood  
Determination of glucose of blood on an empty stomach  
Determination of glycoziled haemoglobin

27. In blood of patient content of glucose| on an empty stomach was 5,65 mmol/l, in 1 hour after the sugar loading was 8,55 mmol/l, and in 2 hours – 4,95 mmol/l. Such indexes are characteristic for:

+Healthy man  
Patient with the hidden saccharine diabetes  
Patient with інсулінозалежним saccharine diabetes  
Patient from інсулінонезалежним by saccharine diabetes  
Patient with a thyrotoxicosis

28. Erythrocyte requires energy in ATP. What process does provide necessary quantity of ATP?

+PPP  
Aerobic of oxidization of glucose  
Anaerobic glicolisis  
Beta-oxidization of fatty acids  
TCA

29. At insufficiency of Thiamin - there is illness of Beri-Beri is occur. Some carbohydrate exchange process is violated. What compound there does accumulate in blood?

Succinate  
Lactate  
+Pyruvate  
Citrate  
Malate