

МИНИСТЕРСТВО ЗДРАВООХРАНЕНИЯ РЕСПУБЛИКИ БЕЛАРУСЬ
УЧРЕЖДЕНИЕ ОБРАЗОВАНИЯ
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Кафедра общей гигиены, экологии и радиационной медицины

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ТЕСТОВЫЕ ЗАДАНИЯ
ПО РАДИАЦИОННОЙ И ЭКОЛОГИЧЕСКОЙ
МЕДИЦИНЕ

Учебно-методическое пособие
для студентов 2 курса
факультета по подготовке специалистов для зарубежных стран

TEST TASKS
ON RADIATION AND ECOLOGICAL MEDICINE

The educational-methodical work
for 2nd year overseas students,
Faculty of General Medicine

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В тестовых заданиях по радиационной и экологической медицине представлены вопросы и ответы на них, литература, способствующие усвоению знаний и навыков, повышению качества подготовки студентов по данному разделу.

Данные тестовые задания предназначены для студентов 2 курса факультета по подготовке специалистов для зарубежных стран.

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CONTENTS

Introduction	4
Questions of the ecological medicine test program	5
Questions of the radiation medicine test program	14
Answers to the radiation and ecological medicine test program	24
Literature	25

INTRODUCTION

In modern terms a radical change in ecological conditions where people live, due to the growth of the negative effects of catastrophic ill-conceived development of technical civilization, the growing importance of training physicians to conduct activities to protect and preserve public health and environment. Formation of an integrated and harmonious system of knowledge and thinking in this area is a necessary component for a full medical work. This will allow the specialist to take into account the impact of environmental factors and lifestyles on the health of individual and appropriately adjust the examination and treatment of patients. The knowledge gained in the study of radiation and ecological medicine, are necessary for targeted preventive measures among critical populations.

Given that radiation therapy and diagnostic methods are used for a large part of patients, doctors must navigate the system of monitoring and recording of individual doses and the principles of optimization of radial loads on patients.

Teaching Radiation and Ecological Medicine at the second course allows you to create an environmentally-oriented focus of thinking and give some results in the study of clinical disciplines.

QUESTIONS OF THE ECOLOGICAL MEDICINE TEST PROGRAM

1. The ecology is a science about:

- a) patterns of mutual relations of organisms among themselves;
- b) patterns of mutual relations of organisms among themselves and with environment on organic, population-specific, biogeocenotic and biospheric levels;
- c) pattern of influence of environment on population health.

2. The ecology purpose is:

- a) optimisation of mutual relations of organisms with environment;
- b) preservation of the environment;
- c) optimisation of mutual relations of organisms among themselves.

3. The subject of studying ecology is:

- a) ecosystem;
- b) animals, humans, plants;
- c) biogeocenosis.

4. The biosphere is:

- a) elementary unit of a noosphere;
- b) the higher form of ecosystems;
- c) set of individuals of one kind.

5. The biogeocenosis is:

- a) a healthy variety of population;
- b) a homogeneous part of biosphere;
- c) elementary unit of biosphere.

6. Characteristics of biogeocenosis are:

- a) layerage, self-regulation, productivity;
- b) a specific variety, a population density, a biomass, layerage;
- c) a spatial locating, a succession.

7. The ecological niche is:

- a) one of a biotone characteristics;
- b) a way of life and, first of all, a way of a biogeocenosis feeding;
- c) a biogeocenosis dwelling place.

8. Supply chains are:

- a) biomass, a specific variety and homeostasis;
- b) chains of intercommunicated species consistently retrieving the substance and energy;
- c) intercommunicated species chains of one ecological niche.

9. Biological succession is:

- a) a daily and annual activity change of the body;
- b) a serial replacement of one biogeocenosis by another;
- c) an interaction of producers and consumers.

10. Artificial biogeocenosis are:

- a) biocenoses and biotones;
- b) autotrophs, heterotrophs, mixotrophs;
- c) anthropocenoses.

11. Specie is:

- a) a totality of individuals which are similar in morphological signs and freely crossing among themselves;
- b) a totality set of the individuals which are similar in morphological, physiological and biochemical signs, freely crossing among themselves and occupying a certain area;
- c) an elementary unit of biosphere.

12. The organism is:

- a) an object and phenomenon of nature;
- b) an elementary structural unit of a type;
- c) an ecological element of environment.

13. The ecological factor is:

- a) the element of environment influencing organisms and causing their adaptation;
- b) the component of environment providing the vital activity of population;
- c) the basic structural component of an areal.

14. The medical ecology is:

- a) a science about interaction of humans with environment;
- b) the section of ecology studying adverse ecological factors;
- c) a science about preventive treatment beginning of a civilization illnesses.

15. To the abiotic factors of an air environment does not relate:

- a) viruses;
- b) humidity;
- c) geomagnetic field.

16. Solar radiation is:

- a) an integrated stream of electromagnetic fluctuations with a various wavelength;
- b) a stream of positively charged ions;
- c) a stream of different sign ions.

17. Wavelength of Ultraviolet (UV) Radiation perniciously operating on live organisms is:

- a) more than 290;
- b) less than 290;
- c) less than 400.

18. A wavelength of a visible part of solar radiation (nanometer) is:

- a) 200–250;
- b) 400–760;
- c) 300–360.

19. The photoperiodism is:

- a) the change of day and night;
- b) the ability of organisms to react to natural light;
- c) ability of organisms to react to change of day length.

20. Limits of temperatures which are optimal for a human(°C):

- a) 15-25;
- b) 20-28;
- c) 12-30.

21. Limits of a relative humidity which are optimal for a human (%):

- a) 40–60;
- b) 30–75;
- c) 15–65.

22. Magnetic storms do not cause:

- a) the activation of inhibition processes in central nervous system (CNS);
- b) the activation of excitation processes in CNS;
- c) working capacity depression.

23. The size of an electric potential gradient does not depend on:

- a) a season of year;
- b) a solar radiation;
- c) weather conditions.

24. The biological effect of air speed is the influencing on:

- a) a peripheric nervous system;
- b) a physical thermoregulation;
- c) blood-vascular system.

25. Atmospheric pressure on a sea level is:

- a) 740 mm Hg;
- b) 760 mm Hg;
- c) 780 mm Hg.

26. The ecological value of a carbon dioxide is:

- a) the participation in formation of a photochemical smog;
- b) the excitation of the respiratory centre;
- c) the absorption of infra-red radiation.

27. To the inert gases which are a part of atmospheric air relate:

- a) argon, hydrogen, carbon dioxide;
- b) neon, xenon, carbon oxide;
- c) argon, neon, helium.

28. To the air impurities of a natural parentage relate:

- a) ammonia;
- b) nitric oxide;
- c) helium.

29. The basic source of microorganisms appearance in the air is:

- a) a soil;
- b) industrial enterprises;
- c) a hydrosphere.

30. During long-term human presence in an electromagnetic field (EMF) may the diseases of organism systems:

- a) of the cardiovascular system;
- b) of the vascular system;
- c) of the respiratory system.

31. Biotic factors of a soil are:

- a) an air permeability;
- b) a moisture capacity;
- c) worms.

32. Soil pollution leads to:

- a) a moisture capacity augmentation;
- b) a calorific capacity augmentation;
- c) a atmosphere pollution.

33. The composition of a soil air does not include:

- a) a carbon dioxide;
- b) a methane;
- c) a nitric oxide.

34. Soils contaminants of the chemical nature are:

- a) a dust;
- b) radionuclides;
- c) hydrocarbons.

35. Indicators of a soil impurity are:

- a) a sanitary number;
- b) a porosity;
- c) a moisture capacity.

36. Acid precipitations are aerosol condensation of:

- a) a sulfurous acid;
- b) a phosphoric acid;
- c) a silicic acid.

37. The technological measures to protect the environment include:

- a) the organisation of sanitary-protective zones;

- b) the development of contaminants maximum concentration limits;
- c) the creation of manufacture without waste.

38. The arrangements measures to protect the environment include:

- a) the organization of enterprises emissions in different times round the clock of twenty-four hours;
- b) the development of contaminants maximum concentration limits;
- c) the clearing emissions from harmful substances.

39. The basic sources of electromagnetic radiation in a city are:

- a) lines of electromagnetic transfers;
- b) radio stations;
- c) industrial enterprises.

40. The superfluous entering of biogenic amines in a human body can cause:

- a) the rising of arterial pressure;
- b) the augmentation of a gastric juice secretion;
- c) the depression of a gastric juice secretion.

41. The superfluous entering of strontium in a human body causes:

- a) a goitrogenic effect;
- b) a nephrotoxic effect;
- c) a mutagenic effect.

42. The superfluous entering of iron in a human body causes:

- a) a liver and spleen siderosis;
- b) a immunity disturbance;
- c) a lesion of the central nervous system.

43. The superfluous entering of aluminium in a human body causes:

- a) a osteogenesis retardation;
- b) the intensifying of a gastroenteric tract motility;
- c) the depression of a mental ability.

44. The phases of detoxication of xenobiotics are phases of:

- a) chemical modifications;
- b) physical modifications;
- c) excretion.

45. Environment monitoring is:

- a) the totality of observations systems estimations and the forecast of environment conditions and the phenomena;
- b) a keeping up with worldwide processes and on the phenomena in Earth biosphere and its ecosphere;
- c) the control over contaminants and agents.

46. In the impact of factors there are the following types of monitoring marked out:

- a) ingrediential;

- b) background;
- c) local.

47. To the ingrediential monitoring is related a control over:

- a) a climate change;
- b) toxic substances;
- c) microorganisms.

48. In methods of researches monitoring is divided into:

- a) microbiological;
- b) physiological;
- c) chemical.

49. Local monitoring could be applied to:

- a) natural recreational resources;
- b) separate objects which are more often a subject of intensive anthropogenic influences;
- c) territories where are protected separate elements of a natural complex.

50. A regional monitoring is a keeping up with:

- a) the development of anthropogenic changes;
- b) the concentration of priority contaminants of an anthropogenic parentage;
- c) processes and phenomena in limits of a large area district which differs from the adjacent in natural conditions.

51. To the physical factors influencing living conditions there are related:

- a) noise, vibration;
- b) anthropotoxins;
- c) microorganisms.

52. To the adverse factors influencing on air environment of dwelling there are not related:

- a) a formaldehyde etc. toxic substances;
- b) electromagnetic fields;
- c) illumination.

53. The basic measures for protection from EMF are:

- a) the restriction of a stay time in places of the magnetic field raised level of industrial frequency;
- b) the carrying out of medical inspections;
- c) the use of an individual defence agents.

54. The optimal heating system in the living room from an ecological point of view is:

- a) a water heating;
- b) a panel heating;
- c) a central heating.

55. As basic physical parameters of EMF are characterized by:

- a) a wavelength and frequency of fluctuations;
- b) a vibration velocity;
- c) an effective temperature.

56. Damage of eye arise under the influence of EMF range of:

- a) a microwave frequency (MWF);
- b) ultra high frequency (UHF);
- c) high frequency (HF).

57. The basic source of radon entering in living spaces is:

- a) an atmospheric air;
- b) a tap water;
- c) a gas cooker.

58. To the sanitary indicator of the effectiveness working ventilation of residential and public buildings there is related:

- a) carbon dioxide;
- b) nitric oxide;
- c) a dust.

59. The biological effect at air ionisation is defined by complex influence of:

- a) aeroions;
- b) ozone;
- c) nitric oxide.

60. Abiotic factors of hydrosphere are:

- a) microorganisms;
- b) a phytoplankton;
- c) a light regime.

61. Biotic factors of a water sphere are:

- a) an oxygen regimen;
- b) carbon dioxide regimen;
- c) animals.

62. Modern problems of hydrosphere are:

- a) the deficiency of fresh water stocks;
- b) the deficiency of a salty water;
- c) the water content augmentation of the rivers.

63. Organoleptic factors of hydrosphere are:

- a) a colour;
- b) a Coli index;
- c) pH.

64. The microorganisms containing in water are:

- a) hemolytic streptococci;
- b) blue pus bacillus;
- c) heterotrophic bacteria

65. Quantity of mineral salts in fresh waters is (g/dm³):

- a) 2,5;
- b) about 1,0;
- c) about 0,1.

66. The use of mineral water with a high mineralization leads to:

- a) the disturbance of water-salt metabolism;
- b) the onset of endemic diseases;
- c) the onset of catarrhal diseases.

67. The systematic use of hard water by the human can lead to:

- a) disturbances function of CNS;
- b) an urolithiasis;
- c) water-nitrate methemoglobinemias.

68. Water is the basic source of entering in to an organism of:

- a) a potassium;
- b) a fluorine;
- c) a iodine.

69. Fluorine participates in:

- a) the development of a teeth;
- b) the development of a Minamata disease;
- c) the development of an endemic goiter.

70. By superfluous entering of fluorine in an organism it develops:

- a) the caries of a teeth;
- b) a fluorosis;
- c) an anaemia.

71. Cobalt participates in:

- a) hemopoiesis stimulations;
- b) a fatty exchange;
- c) a breath.

72. At a manganese deficiency arises:

- a) the disturbance of function of kidneys;
- b) a convulsive illness;
- c) a growth inhibition.

73. Water polluters are:

- a) the industrial enterprises;
- b) radionuclides;
- c) heavy metals.

74. Pollutants of water of the physical nature are:

- a) radionuclides;
- b) pesticides;
- c) nitrosamines.

75. Influence of an organic parentage pollutants on hydrosphere is:

- a) a photosynthesis acceleration;
- b) the retardation of self-cleaning processes;
- c) the acceleration of self-cleaning processes.

76. The use of water with the raised cadmium content can cause in the human:

- a) caries;
- b) an osteoporosis;
- c) cancerogenic effect.

77. The superfluous content of chlorine in potable water:

- a) worsens taste;
- b) enlarges chromaticity;
- c) reduces turbidity.

78. Pollution of water by nitrates speaks about:

- a) the augmentation of rigidity of water;
- b) the presence of old fecal pollution;
- c) a fresh fecal pollution.

79. Excess of fluorine in water causes:

- a) a fluorosis;
- b) caries;
- c) an endemic goiter.

80. Industrial sewage of cities contain:

- a) phenolums;
- b) pesticides;
- c) fertilizers.

QUESTIONS OF THE RADIATION MEDICINE TEST PROGRAM

1. A nuclear charge equal to the ...

- a) number of protons in the nucleus;
- b) number of neutrons in the nucleus;
- c) sum of the number of protons and neutrons in the nucleus.

2. The nucleus of potassium-40 atom contains 19 protons and 21 neutrons. What is the atomic number of this item?

- a) 19;
- b) 40;
- c) 21.

3. The term «nucleon» belongs to ...

- a) beta particles;
- b) proton;
- c) alpha-particles.

4. Isotopes are ...

- a) atoms with different atomic number, but an equal number of neutrons in the nucleus;
- b) atoms with different atomic number and mass number;
- c) atoms with one and the same atomic number but with different mass numbers.

5. To the term «radionuclide» refers ...

- a) the nucleus of a radioactive element;
- b) the particle, part of the nucleus;
- c) the nucleus of the stable atom.

6. A unit of radioactivity is ...

- a) Gy;
- b) Bq;
- c) R.

7. The Law of the Republic of Belarus «On radiation safety» stated that the basic principles of radiation safety practices are:

- a) an optimization principle;
- b) the principle of limiting doses of external and internal exposure of the population at the expense of Chernobyl radionuclides release;
- c) the principle of noninterference.

8. The Law of radioactive decay characterizes ...

- a) the reduction in the number of active atoms in time;
- b) the type of decay of radioactive nuclei;
- c) the mode energy release of radioactive nuclei.

9. During the process of alpha decay is ...

- a) formed daughter nucleus with a mass less by 4 and with a charge less by 2 than in the mother nucleus;
- b) nucleus is ejected from a heavy nucleus of a hydrogen atom;
- c) formed a new nucleus with the mass and charge less by 2 than that of the mother nucleus.

10. By calculating of the equivalent dose using radiation weighting factor should be taken into account:

- a) the radiosensitivity of the tissue to this type of radiation;
- b) the lethality of this type of radiation compared to a standard X-rays;
- c) the probability of stochastic effects of irradiation.

11. The equivalent dose is ...

- a) the radiation dose equal to the product of the absorbed dose weighting factor for the tissue of the body;
- b) the radiation dose equal to the product of the exposure dose by a factor of the quality of ionizing radiation;
- c) the radiation dose equal to the product of the absorbed dose by a factor of the quality of this type of ionizing radiation.

12. Tissue weighting multiplier is used to calculate a ...

- a) exposure dose;
- b) equivalent dose;
- c) effective dose.

13. Unit of absorbed dose corresponds to the ...

- a) rad;
- b) J;
- c) Sv.

14. A dose of 1 Gy corresponds to the absorption of ...

- a) 1 J energy 1g of substance;
- b) 1 J energy 1 kg of substance;
- c) 1 meV energy 1kg of substance.

15. Gray is a unit of a ...

- a) absorbed dose;
- b) equivalent dose;
- c) exposure dose.

16. To the unit of equated dose corresponds ...

- a) R;
- b) Ci ;
- c) Sv.

17. One rad is equal to ...

- a) 10 mSv;
- b) 10 mGy;
- c) 0,01 R.

18. Sievert is a measure unit of a ...

- a) absorbed dose;
- b) equivalent dose;
- c) exposure dose.

19. The unit of effective dose is ...

- a) rad;
- b) mGy;
- c) mSv.

20. To the effects of deoxyribonucleic acid (DNA) double strand breaks are related ...

- a) chromosome aberrations;
- b) the formation of thymine dimmers;
- c) a transmutation effect.

21. Application of the scintillation method of ionizing radiation registration is based on ...

- a) gas ionization in the gas-discharge counters;
- b) the photon radiation registration of some liquids and crystals that arise under the influence of ionizing radiation;
- c) illumination of the films.

22. Owing to a increasing of linear energy transfer there is ...

- a) reduced oxygen effect;
- b) increased the oxygen effect;
- c) no change of the oxygen effect.

23. Direct (primary) type of ionizing radiation is a...

- a) neutron – radiation;
- b) beta – radiation;
- c) gamma – radiation.

24. A receptive device in apparatus based on the ionization method of ionizing radiation registration is ...

- a) a scintillator;
- b) Geiger-Muller counter;
- c) a photographic film.

25. The difference between X-ray and gamma radiation with the same energy is:

- a) the penetrating power;
- b) the quality factor;
- c) the origin.

26. The quality factor of radiation characterizes ...

- a) the striking ability of this type of radiation;
- b) the penetrating ability of this type of radiation;
- c) the detection efficiency of radiation.

27. The highest quality factor has ...

- a) alpha – radiation;
- b) beta – radiation;
- c) gamma – rays.

28. The total annual effective dose of human exposure due to different sources of radiation is ...

- a) 3 mSv/year;
- b) 3 mrem/year;
- c) 3 mrem/year.

29. The main contribution to the formation of a natural background radiation make ...

- a) a cosmic radiation;
- b) sources of terrestrial origin;
- c) a nuclear energy.

30. To the cosmogenic radionuclides are related ...

- a) potassium-40;
- b) Na-22;
- c) radium - 226.

31. The founder of the radioactive series is ...

- a) lead-210;
- b) radium-226;
- c) uranium-235.

32. The highest dose of internal radiation is formed due to ...

- a) thorium decay-series;
- b) uranium decay-series;
- c) neptunium decay-series.

33. Lead-210 ...

- a) accumulates mainly in adipose tissue;
- b) accumulates mainly in bone tissue;
- c) undergoes alpha decay.

34. The main contribution to the formation of the annual effective dose of the population due to natural radionuclides which are not included in the radioactive series introduces ...

- a) rubidium-87;
- b) potassium-40;
- c) tritium.

35. Of the components of technological-intensive radiation background the most radiation dose on the population is formed by ...

- a) global fallout from nuclear weapons tests;
- b) X-ray and radiodiagnostic procedure;
- c) TV.

36. Global fallout of radionuclides are formed by ...

- a) radioactive substances fallen within a radius of 30 km from their point of a radioactive emission;
- b) radioactive substances introduced into the upper layer of troposphere and stratosphere;
- c) radioactive substances scattered on the surface of the Earth's crust.

37. Of the intermediate products of uranium decay the main contribution to the formation of yearly effective dose (YED) population exposure from natural background radiation makes ...

- a) lead-206;
- b) radon-222;
- c) radium-226.

38. Radon-222 comes to the environment from ...

- a) a soil and groundwater;
- b) a solar cosmic radiation;
- c) a car exhaust.

39. The main part of the dose from radon exposure is formed ...

- a) by the expense of the radon;
- b) due to radon decay products adsorbed on aerosol particles;
- c) by themselves radon decay products.

40. The main dose load on the lungs is caused by ...

- a) sorbed on aerosols of alpha-emitting decay products of radon;
- b) sorbed on aerosols of beta-emitting decay products of radon;
- c) sorbed on aerosols, of gamma-emitting decay products of radon.

41. Chernobyl release radionuclides emerging now the primary dose load on the human body are:

- a) iodine-131;
- b) Cs-137;
- c) ruthenium-106.

42. Emission Chernobyl radionuclides that have predominantly skeletal type of distribution in the human body are:

- a) iodine-131;
- b) strontium-90;
- c) tritium.

43. On the territory of the pollution density with cesium-137 less than 5 Ci/km² the greatest importance in shaping the dose on the human body has:

- a) irradiation for ingestion of radionuclides to the body;
- b) irradiation with inhalation of radionuclides to the body;
- c) exposure from deposition of radionuclides on the environment objects.

44. Most short-term impact of the Chernobyl release radionuclides on the human body has ...

- a) irradiation for ingestion of radionuclide;
- b) irradiation with inhalation of radionuclides;
- c) irradiation from a radioactive cloud.

45. Chernobyl release radionuclides with a uniform type of distribution in human organism are:

- a) Cs-137;
- b) plutonium-239;
- c) iodine-131.

46. Immediately after the Chernobyl accident the bulk of the radiation dose at the population was formed by ...

- a) cesium-137;
- b) cesium-134;
- c) iodine-131.

47. As a result of the Chernobyl release the greatest part of the territory of Belarus polluted with ...

- a) strontium - 90 and strontium – 89;
- b) plutonium – 240 and plutonium – 240;
- c) cesium - 134 and cesium – 137.

48. Immediate resettlement zone corresponded to the territory of the Republic with contamination density of cesium-137 is ...

- a) more than 40 Ci/km²;
- b) 15–40 Ci/km²;
- c) 1–5 Ci/km².

49. The contamination density of the Republic territory of Cs-137 from 15 to 40 Ci/km² corresponds to zone ...

- a) with the right to resettlement;
- b) of periodic radiation control;
- c) of subsequent resettlement.

50. Absorption of strontium-90 in the gastrointestinal tract of an organism decreases ...

- a) during lactation;
- b) in childhood;
- c) by using calcium-rich food.

51. To formation of «spotted» contamination of the Republic territory as a result of the Chernobyl accident contributed ...

- a) a high-activity;
- b) a duration and a uneven ejection time of the release;
- c) abnormally high temperatures.

52. Chernobyl release radionuclides with long-term biological half-life of an organism are:

- a) americium-241;
- b) tritium;
- c) cesium-134.

53. Radionuclide enters the body primarily through the gastrointestinal tract thanks due to ...

- a) a high-energy radiation;
- b) the high degree of accumulation in the body;
- c) a good solubility.

54. Mainly by inhalation to the organism enters ...

- a) cesium-137;
- b) strontium-90 ;
- c) americium-241.

55. Bergognie-Tribondo rule is formulated as:

a) the radiosensitivity of tissues is directly proportional to the proliferative activity and inversely proportional to the degree of differentiation of its constituent elements;

b) the radiosensitivity of tissues is directly proportional to the degree of differentiation of its elements and is inversely proportional to their proliferative activity;

c) radiosensitivity of tissues is directly proportional to the proliferative activity and degree of differentiation of its elements.

56. High radiosensitivity has ...

- a) endocrine system;
- b) bone;
- c) red bone marrow.

57. An exception to the Bergognie-Tribondo rule are ...

- a) leukocytes;
- b) nerve cells;
- c) lymphocytes.

58. The transmutation effect is connected with ...

- a) formation of thymine dimmers;
- b) transformation in the nucleic bases C-14 in to the stable nitrogen;
- c) decay of radioactive iodine in the thyroid gland.

59. In the dose range of 1–10 Gy develops ...

- a) cerebral syndrome;
- b) medullary syndrome;
- c) gastrointestinal syndrome.

60. Cerebral radiation syndrome develops at doses of ...

- a) 10 Gy;
- b) about 50 Gy;
- c) over 100 Gy.

61. The intestinal form of acute radiation disease occurs at a dose of ...

- a) 1–10 Gy;
- b) 10–20 Gy;
- c) 10–40 Gy.

62. Third degree of severity of acute radiation sickness (ARS) corresponds to the dose of ...

- a) 1–2 Gy;
- b) 4–6 Gy;
- c) 6–10 Gy.

63. To deterministic effects of radiation exposure is related ...

- a) leukemia;
- b) reproductive disorders;
- c) skin cancer.

64. To the stochastic effects of radiation exposure is related...

- a) non-neoplastic lesions form of blood;
- b) ray cataract;
- c) skin cancer.

65. The mechanism of irradiation deterministic effects occurrence is based on ...

- a) radiation block mitosis;
- b) excess of the number of dead cells over the number of survivors;
- c) mutations in the germ cells.

66. Threshold dose (the threshold of clinical effect) could be related to ...

- a) deterministic effects of radiation exposure;
- b) stochastic effects of radiation exposure;
- c) genetic effects of radiation exposure.

67. As small doses for given type of organism are called doses ...

- a) of 2 magnitude orders lower than the lethal dose (LD50);
- b) of order magnitude lower than the LD50;
- c) equal to LD50.

68. Radiation hormesis is ...

- a) a beneficial effect of radiation trace doses;
- b) an enhancing phenomenon of ionizing radiation negative effect in the low dose range;
- c) increasing of the stochastic effects risk in exposed humans.

69. Stochastic effects of radiation exposure are characterized by:

- a) the presence of a threshold dose;
- b) absence of threshold dose;
- c) evident in any event at a threshold dose.

70. Deterministic effects of radiation exposure include:

- a) radiation cataract;
- b) neoplastic thyroid disease;
- c) increased incidence of somatic disorders.

71. LD50 for a human is ...

- a) 10 Gy;
- b) 4 Gy;
- c) 0, 4 Gy.

72. Genetic effects of radiation exposure are characterized by ...

- a) evidence in any case at a threshold dose;
- b) rate expression depending on the collective dose;
- c) a threshold dose.

73. Radiation Safety Standards (RSS)-2000 ...

- a) establish a system of fundamental limits of doses and principles of their application;
- b) contain requirements for the protection of the environment from pollution by radioactive substances;
- c) contain requirements for the organization of work with sources of ionizing radiation.

74. RSS-2000 subjects are related to the following types of ionizing radiation on human beings:

- a) in normal operation of man-made sources of radiation;
- b) to cosmic radiation at Earth's surface;
- c) to internal radiation generated by natural potassium.

75. RSS-2000 set the following categories of exposed individuals:

- a) staff, all people, including those from staff, outside the sphere and the conditions of their production activities;
- b) the population living in territories with contamination density of Cs-137 over 1 Ci / km²;
- c) population receiving further from anthropogenic change of the background more than 1 mSv per year.

76. According to the Law of the Republic of Belarus «On radiation safety of the population» exposure of the population and staff due to the content of radon and natural gamma-emitting radionuclides in residential and industrial buildings ...

- a) is not regulated;
- b) should not exceed the established standards;
- c) do not take into account at assessing the dose of background radiation.

77. In the Law of the Republic of Belarus «On radiation safety» there is followed a definition of a radiation accident:

- a) loss-ionizing radiation source which could lead or has led to the exposure of people or radio-active contamination of the environment beyond the established norms;
- b) is any situation involving the improper actions of staff which could lead or has led people to radiation or radioactive contamination of the environment in excess of established norms;
- c) control loss of ionizing radiation source caused by malfunction, damaged equipment, improper actions of employees (staff), natural disasters or other causes that could lead or has led people to radiation or radioactive contamination of the environment beyond the established norms.

78. By the Law of the Republic of Belarus «On radiation safety of population» in case of radiation accidents ...

- a) increased exposure of citizens engaged for rescue and decontamination is not regulated;
- b) increased exposure of citizens engaged for rescue and decontamination is allowed at time period of their lives with free consent;
- c) increased exposure of citizens engaged for rescue and decontamination is not considered.

79. Introduction to the diet of stable micro elements which compete with radionuclides allows ...

- a) speed removal of radionuclides from the body;
- b) reduce the absorption of radionuclides in the gastrointestinal tract;
- c) bind radionuclides in the gastrointestinal tract.

80. For the radiation dose reduction and prevention of adverse effects in conducting pregnant women radiological examinations...

- a) a conduct radiological diagnostic should be strictly prohibited;
- b) preventive studies should be carried out according to strict clinical indications;
- c) dose to the fetus should not exceed 0,01 Sv.

**ANSWERS TO THE RADIATION
AND ECOLOGICAL MEDICINE TEST PROGRAM**

ECOLOGICAL MEDICINE

1	b	21	a	41	a	61	c
2	a	22	b	42	a	62	a
3	a	23	b	43	a	63	c
4	b	24	b	44	a	64	c
5	c	25	b	45	a	65	b
6	b	26	b	46	a	66	b
7	b	27	c	47	b	67	b
8	b	28	a	48	c	68	b
9	b	29	a	49	c	69	a
10	c	30	a	50	c	70	b
11	b	31	c	51	a	71	a
12	b	32	c	52	c	72	c
13	a	33	c	53	a	73	a
14	a	34	c	54	b	74	a
15	a	35	a	55	a	75	b
16	a	36	a	56	a	76	b
17	b	37	c	57	c	77	a
18	b	38	a	58	a	78	b
19	c	39	b	59	a	79	a
20	a	40	a	60	c	80	a

RADIATION MEDICINE

1	a	21	b	41	b	61	b
2	c	22	a	42	b	62	b
3	b	23	b	43	a	63	b
4	c	24	b	44	c	64	c
5	a	25	c	45	a	65	b
6	b	26	a	46	c	66	a
7	a	27	a	47	c	67	a
8	a	28	b	48	a	68	a
9	a	29	b	49	c	69	b
10	b	30	b	50	c	70	a
11	c	31	c	51	b	71	b
12	c	32	b	52	a	72	b
13	a	33	b	53	c	73	a
14	b	34	b	54	c	74	a
15	a	35	b	55	a	75	a
16	c	36	b	56	c	76	b
17	a	37	b	57	c	77	c
18	b	38	a	58	b	78	b
19	c	39	b	59	b	79	b
20	a	40	a	60	c	80	c

LITERATURE

1. *Pivovarov, U. P.* Hygiene and bases ecology of the human: textbook / U. P. Pivovarov. — M., 2004.
2. *Stogarov, A. N.* Ecological medicine: stud. manual / A. N. Stogarov. — 2-ed. — Minsk, 2002.
3. *Radkevich, V. A.* Ecology: textbook / V. A. Radkevich. — 4-ed., ster. — Minsk, 1998.
4. *Ilin, L. A.* Radiation medicine / L. A. Ilin, V. F. Kirillov, I. P. Korenkov. — M.: Medicine, 1999.
5. Radiation medicine: textbook / A. N. Stogarov [et al.]; ed. A. N. Stogarov. — Minsk, 2010.

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ПО РАДИАЦИОННОЙ И ЭКОЛОГИЧЕСКОЙ МЕДИЦИНЕ
(на английском языке)

Учебно-методическое пособие
для студентов 2 курса
факультета по подготовке специалистов для зарубежных стран

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