UNIVERSITY OF EAST SARAJEVO
Practice questions for entrance test

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CELL BIOLOGY

1 . The biological discipline dealing with the study of cell organization is called:
a) histology
b) genetics
c) cytology
d) ornithology

2 . The basic morphological and functional unit of living matter is:
a) cell
b) tissue
c) individual
d) population

3 . An important component of hemoglobin is:
a) magnesium
b) potassium
c) calcium
d) iron

4. Which chemical bonds will the amino acids bind to form the polymer:
a) phosphodiester
b) peptide
c) glycosidic
d) hydrogen

5. Complex proteins:
a) consist of multiple polypeptide chains
b) are formed by fusing simple proteins with other non-protein molecules
c) are albumins
d) are globulins

6. Glycolipid composition includes:
a) fats and sugars
b) protein and sugars
c) fats and proteins
d) polysaccharides

7. Enzymes are by their chemical nature:
a) proteins
b) sugars
c) fats
d) nucleic acids

The correct answer has written in red colour and underlined

8 . The enzymes that desompose fats are called:
   a) nucleases
   b) proteinases
   c) lipases
   d) ligases

9. The enzymes that decomposeproteins are called:
   a) lipases
   b) polymerases
   c) glycosidases
   d) proteinases

10. Mitochondria are centers of synthesis:
   a) adenosine triphosphate
   b) lipids and carbohydrates
   c) lipids and proteins
   d) proteins andcarbohydrates

11. Viruses consist of:
   a) DNK, RNK and proteins
   b) DNK or RNK and proteins
   c) DNK, ribosomes and proteins
   d) RNK, ribosomes and proteins

12. The process of synthesis of complex organic compounds is simpler form of:
   a) basal metabolism
   b) catabolism
   c) energy transport
   d) anabolism

13. During anabolic biochemical reactions, energy is provided by the molecules:
   a) AMP
   b) FAD
   c) ATP
   d) NADP

14. Part of ATP is:
   a) adenine
   b) ribose
   c) three phosphate groups
   d) all the above components

15. The ability of cells to secrete their products is called:
   a) respiration
   b) absorption
   c) proliferation
   d) secretion

16. The specialized cells in the body receiving stimuli are:
   a) effectors
   b) receptors
   c) muscular cells
   d) glandular cells

*****The correct answer has written in red colour and underlined*****

17. The ability of a cell to respond to a stimulus by shortening the cell or part of it is called: a) conductivity
    b) proliferation
    c) contactability
    d) polarity
18. Catabolism is:
    a) uptake of substances into the cytoplasm
    b) the process of synthesis of complex compounds with the action of enzymes and energyconsumption
    c) decomposition of complex compounds into simple ingredients with energy release
    d) the sum of all biochemical processes in the organism

19. Cell growth is:
    a) the process of forming two equal cells out of one
    b) process of proloferation
    c) an increase in its size and volume
    d) all the above processes

20. Some cells lose the ability to divide after birth, for example the cells of:
    a) epidermis
    b) intestinal epithelium
    c) endocrine glands
    d) nerve (cells)

21. The nucleus is present in all mammalian cells EXCEPT:
    a) nerve cells
    b) mature red blood cells
    c) spermatozoa
    d) certain embryonic cells

22. For muscle contraction essential are:
    a) actin, myosin and tubulin
    b) actin, tubulin and ATP
    c) myosin and tubulin
    d) actin, myosin and ATP

23. Which form of transport through the membrane requires energy:
    a) free diffusion
    b) facilitated diffusion
    c) active transport
    d) the answers under b) and c) are correct

24 . The cells of which organisms most rapidly divide:
    a) mammals
    b) poikilothermic organisms
    c) plants
    d) bacteria

25. Carbon dioxide and water are the final decomposition products:
    a) fat
    b) carbohydrates
    c) protein

*****The correct answer has written in red colour and underlined*****

d) all said organic molecules

BIOLOGY OF DEVELOPMENT

26. During mitosis, the following does NOT occur:

a) enzyme synthesis

b) chromosome condensation

c) separation of centrosome

d) disintegration of the nucleus membrane

27. Meiosis is a process characteristic of:

a) bacteria

b) formation of gametes

c) viruse replication

d) some Protozoa

28. Upon completion of I meiotic division, the human cell contains: a) 23 pairs of homologous chromosomes

b) 46 chromosomes

c) 23 DNA molecules

d) 46 DNA molecules

29. During mitosis, the following occurs:

a) duplication of the number of chromosomes

b) duplication of the amount of DNA

c) duplication of centrioles

d) synthesis of histones

30. Circle the correct statement:

a) the number of chromosomes in a mature human sex cell is 46

b) the number of chromosomes in a mature human sex cell is 23

c) the number of chromosomes in a human somatic cell is 23

d) the number of chromosomes in somatic cells is haploid

31. The seminal ducts of the testis do NOT contain: a) Sertoli cells

b) spermatogonia

c) spermatocytes

d) follicular cells

32. Transformation of spermatids into spermatozoa occurs during:

a) spermiogenesis

b) mitotic divisions

*****The correct answer has written in red colour and underlined*****

c) I meiotic division
d) II meiotic division

33. The growth of follicles in the ovary is affected by:
a) luteinizing hormone
b) yellow body hormone
c) prolactin
d) folliculostimulating hormone

34. Cyclic maturation of gametes is in:
a) female
b) male
c) both female and male
d) in neither sex

35. Ectoderm forms:
a) nervous system
b) blood vessel system
c) heart
d) skeleton

36. The first embryonic bandage around an embryo is:
a) chorion
b) amnion
c) allantois
d) yolk sac

37. Amnion consists of:
a) ectoderm and mesoderm
b) ectoderm
c) endoderm
d) mesoderm and endoderm

38. Amnion contains:
a) endoderm on the inside and mesoderm on the outside
b) mesoderm on the inside and ectoderm on the outside
c) ectoderm on the inside and mesoderm on the outside
d) endoderm on the inside and ectoderm on the outside

39. Horion consists of:
a) endoderm
b) mesoderma
c) ectoderm and mesoderma
d) mesoderm and endoderm

*****The correct answer has written in red colour and underlined*****

40. The following develops from the epidermis: a) spinal cord
    b) parts of the brain
    c) cornea
    d) liver

41. The following develops from the endoderm:
    a) senses
    b) pancreas and liver
    c) skin glands
    d) muscles

42. The following develops from the mezsderm: a) intestines
    b) skin glands
    c) lungs
    d) testicles

43. In an adult organism, ability to proliferate is lost in cells of:
    a) heart
    b) brain
    c) kidney
    d) liver

44. Estrogen is a hormone: a) of oocytes
    b) of ovarian membrane
    c) of ovarian follicle cell
    d) secreted by all the ovarian cellular elements

45. The early gastrula contains:
    a) endoderm cells
    b) ectoderm cells
    c) cells from which the mesoderm is formed
    d) all the cells listed

46. Embryonic inductions begin in:
    a) morula
    b) blastula
    c) gastrula
    d) neurula

47. Gastrula:
    a) has a single germ layers
    b) has not germ layers
    c) has three germ layers
    d) has four germ layers

48. Blastodisc is:
    a) blastula in birds
    b) part of the blastula around the blastopore
    c) one of the germ layers
    d) blastula in insects

*****The correct answer has written in red colour and underlined*****

49. Maturation of spermatozoa takes place in:
    a) the epididymis ducts and the female reproductive tract
    b) seminal ducts
    c) testicle
    d) during spermiogenesis

50 . From mesoderm the following is formed:
    a) nervous system
    b) intestinal system
    c) muscular system
    d) liver

BASICS OF MOLECULAR BIOLOGY

51. Genetic information consists of:
    a) amino acid sequence
    b) ribonucleotide sequence
    c) deoxyribonucleotide sequence
    d) pentose sequence

52. The primary products of genes are:
    a) amino acids
    b) ribonucleotides
    c) polypeptides
    d) ribonucleic acids

53. In the process of transcription the following is developed:
a) mRNA
b) tRNA
c) rRNA
d) all three types of RNA

54 . The codons are found in:
a) mRNA
b) rRNA
c) tRNA
d) all types of RNA

55. A genetic code or genetic password is carried by:
a) DNA
b) mRNA

*****The correct answer has written in red colour and underlined*****

c) rRNA

d) tRNA

56. Changes in the genetic basis at the nucleotide level are called:

a) modifications

b) pleiotropies

c) gene mutations

d) epistasis

57 . During development, genetic activity is affected by:

a) humidity

b) nutrition

c) acidity of the environment

d) all of the above factors

58. Which of the following properties are significantly influenced by environmental factors?:

a) body size

b) number of teeth

c) eye colour

d) number of vertebrae

59. Which of the following properties are little affected by environmental factors?:

a) shape of some part of the body

b) body size

c) eye colour

d) speed of development

60. Which of the following is a qualitative characteristic?:

a) number od fingers

b) number of teeth

c) number of vertebrae

d) shape of some part of the body

61. Which of the following is a quantitative characteristic?:

a) body size

b) speed of development

c) number of teeth

d) skin colour

*****The correct answer has written in red colour and underlined*****

62. What is the difference between the DNA chain and the RNA chain:

a) in sugar
b) in the base
c) in length
d) in all three components

63. Which process is based on the principle of complementarity:

a) replication
b) transcription
c) translation
d) all statements are correct

64. Protein composition includes:

a) amino acids
b) phosphoric acid
c) nitric acid
d) fatty acids

65. The complementarity of chains in a DNA molecule is present:

a) only in eukaryotes
b) only in single-celled eukaryotic and prokaryotic organisms
c) in all living organisms
d) in a large number of segments of DNA molecules

66. How many basic types of nucleic acids exist in the living world?:

a) two
b) three
c) four
d) five

67. Genetic code:

a) varies from organism to organism
b) is the same for all individuals within one species
c) is the same for all eukaryotes and prokaryotes
d) it is the same for all eukaryotes, prokaryotes and viruses

68. What does regulatory gene mean?:

a) It is the gene regulating the activity of all genes in one cell
b) It is the gene regulating the activity of a structural gene
c) It is the gene regulating translation
d) It is the gene controling cell cycle

69. Phenotype means:

a) the visible characteristics of an organism
b) the molecular structure of the cell

*****The correct answer has written in red colour and underlined*****

c) the ability of an organism to perform certain biological functions
d) All statements are correct

70. The phenotype results from:
a) the cooperation of all the genes in one cell
b) genotype-environment interaction
c) inheritance of the parental phenotype
d) All statements are correct

71. What is a structural gene?:
a) It is the gene that provides a double-chain DNA structure
b) It is a portion of DNA that allows the activity of other genes
c) It is a portion of DNA that contains instructions for the synthesis of one polypeptide d) All of the above is true

72. What determines the order of amino acids in a polypeptide?:
a) the sequence of groups of 4 nucleotides in DNA molecule
b) the sequence of the dinucleotides in DNA
c) the sequence of the nucleotide triplet in DNA
d) all answers are correct

73. The DNA structure model was explained by:
a) Jacob and Monod
b) Watson and Crick
c) McLeod and McCarty
d) Avery and Chargaff

74. A peptide bond is formed between: a) two polypeptide chains
b) two amino acids
c) polypeptides and oligosaccharides
d) lipid and protein

75. Each tRNA recognizes:
a) only a specific amino acid
b) two similar amino acids
c) at least three amino acids
d) several different amino acids

INHERITANCE MECHANISMS

76. Genome is a term meaning:
a) set of genes in gametes
b) set of genes that form all the chromosomes in the nucleus
c) set of genes on one chromosome

*****The correct answer has written in red colour and underlined*****

d) set of regulatory genes in eukaryotes

77. The weakest mutagenic effect is caused by:
    a) ultraviolet radiation
    b) X-radiation
    c) electron radiation
    d) all the above-mentioned radiation exhibits an equal mutagenic effect

78. Deviant behaviors:
    a) are always conditioned by chromosome aberrations
    b) depend solely on the environmental factors
    c) are under polygenic contro
    d) all answers are correct

79. Circle the correct statement:
    a) all eukaryotic genes mutate spontaneously at the same rate
    b) Turner's syndrome results from a defective DNA repair mechanism
    c) car exhaust gases are very harmful mutagenes
    d) in some people, the light of the visible spectrum leads to mutations

80. Human chromosomes differ in:
    a) size
    b) centromere position and size
    c) gene size and content
    d) size, centromere position and gene content

81. Two more X-chromosomes in a man:
    a) have letalan efekat
    b) causes infertility
    c) leads to mental retardation
    d) causes infertility and leads to mental retardation

82. Which of the following disorders is the result of an unbalanced translocation:
    a) Down's syndrome
    b) astigmatism
    c) alkaptonuria
    d) Turner's syndrome

83. The following is autosomal dominantlyinherited:
    a) albinism
    b) alkaptonuria
    c) syndactylia

*****The correct answer has written in red colour and underlined*****

d) daltonism

84. Klinefelter syndrome is a consequence of:

a) mutations on the X-chromosome
b) excess of autosomes
c) X-chromosome aneuploidy
d) excess of X or Y chromosomes

85. Which of the following factors can transform a normal cell into a malignant:

a) chemical substances
b) ionizing radiation
c) viruses
d) all of the above factors

86. The first cousins are in:

a) the first degree of kinship
b) the second degree of kinship
c) the fourth degree of kinship
d) the third degree of kinship

87. At the birth of a female child with daltonism, it can be surely stated that:

a) the mother is the daltonist, the father is of normal vision
b) the father is the daltonist, the mother is of normal vision
c) the mother is the carrier, the father is the daltonist
d) both mother and father are normal

88. Hemophilia is a disease:

a) related to mutation on 21th chromosome
b) predominantly inherited
c) which sons always inherit from their father
d) linked to the X chromosome

89. As a result of a gene mutation, the following occurs:

a) sickle cell anemia
b) cystic fibrosis
c) both of the mentioned diseases
d) none of the mentioned diseases

90. Barr's body is:

a) type of antibody
b) organelle for movement in protozoa
c) inactive X-chromosome
d) part of the chromosome near the centromere

*****The correct answer has written in red colour and underlined*****

91. In what hereditary disorder can the cause be either structural or numerical chromosome aberration?:
    a) in the case of manic-depressive psychosis
    b) dwarfism
    c) Down's syndrome
    d) Edwards' syndrome
92. The highest sensitivity to ionizing radiation is recorded in:
    a) bacteria
    b) protozoa
    c) insects
    d) mammals

93. Mental illnesses can be:
    a) conditioned by numerical and structural aberrations of chromosomes
    b) under polygenic control
    c) conditioned by gene mutations
    d) all statements are correcti

94. The appearance of mosaicism in the phenotypic appearance of an organism is related to:
    a) micromutations
    b) macromutations
    c) somatic mutations
    d) reverzsible mutations

95. It can certainly be expected that the son will inherit from his father the following:
    a) hemophilia
    b) hairy ears
    c) hemophilia andhairy ears
    a) no answer is correct

96. B blood type woman received a child of 0 blood type. The child's father may have:
    a) any blood type
    b) only the same blood type as the child
    c) B, 0 or A blood types
    d) B or 0 blood types

97. When parents have children with AB and 0 blood types, it can be concluded that they are:
    a) heterozygotes with different blood types
    b) any blood type
    c) homozygotes with different blood types
    d) one homozygote, another heterozygote with different blood types

98. Aneuploidies of acrocentric chromosomes cause:
    a) Edwards' syndrome
    b) Down's and Patau's syndromes
    c) Down's and Edwards' syndromes
    d) Down's syndrome

99. When a daltonist son is born from the marriage of normal parents, it can be concluded that the disorder is inherited:
    a) from the mother's or father's father
    b) from one of father's parents
    c) from father's father
    d) from one of mother's parents

*****The correct answer has written in red colour and underlined*****

100 . Amniocentesis is used to detect hereditary disorders in:

a) embryos up to three months old
b) blastocysts
c) a fetus about 16 weeks old
d) newborns

*****The correct answer has written in red colour and underlined*****