JEPAS(PG)-2020

Subject: M. Sc in Medical Biotechnology (MSc BT)-2020

Duration: 90 minutes **Full Marks: 100**

Instructions

1. All questions are of objective type having four answer options for each. Only one option is correct. Correct answer will carry full marks 1. In case of incorrect answer or any combination of more than one answer, ¼ mark will be deducted.
2. Questions must be answered on OMR sheet by darkening the appropriate bubble marked A, B, C, or D.
3. Use only **Black/Blue ball point pen** to mark the answer by complete filling up of the respective bubbles.
4. Mark the answers only in the space provided. Do not make any stray mark on the OMR.
5. Write your roll number carefully in the specified locations of the **OMR**. Also fill appropriate bubbles.
6. Write your name (in block letter), name of the examination centre and put your full signature in appropriate boxes in the OMR.
7. The OMR is liable to become invalid if there is any mistake in filling the correct bubbles for roll number or if there is any discrepancy in the name/ signature of the candidate, name of the examination centre. The OMR may also become invalid due to folding or putting stray marks on it or any damage to it. The consequence of such invalidation due to incorrect marking or careless handling by the candidate will be sole responsibility of candidate.
8. Candidates are not allowed to carry any written or printed material, calculator, docu-pen, log table, wristwatch, any communication device like mobile phones etc. inside the examination hall. Any candidate found with such items will be **reported against** & his/her candidature will be summarily cancelled.
9. Rough work must be done on the question paper itself. Additional blank pages are given in the question paper for rough work.
10. Hand over the OMR to the invigilator before leaving the Examination Hall.

1) _____helps in the regulation of blood volume and blood pressure:

a) Iron.
b) Iodine.
c) Sodium.
d) Phosphorous.

2) Name the first cell which is recruited at the place of infection:

a) Nk cells.
b) Basophils.
c) Neutrophils.
d) Eosinophil.

3) What is angiogenesis?

a) Differentiation process.
b) Growth factors.
c) Contact inhibition.
d) Blood vessel formation.

4) The site of aerobic respiration in eukaryotic cells is_____:

a) Peroxisome.
b) Plastid.
c) Mitochondria.
d) Cilia.

5) Name the hormone which is secreted during puberty?

a) Vasopressin.
b) FSH.
c) Oxytocin.
d) Relaxin.

6) Which of the following nutrient deficiency causes megaloblastic anaemia?

a) Folic acid.
b) Niacin.
c) Pyridoxine.
d) Cobalamin.

7) A plasmid consisting of its own DNA with a foreign DNA inserted into it is called:

a) Recombinant DNA.
b) Non-coding DNA.
c) Junk DNA.
d) None of the above.

8) Which of the following enzyme deficiency leads to hemolytic anaemia?

a) Glucokinase.
b) Pyruvate Kinase.
c) Phosphoglucomutase.
d) Phosphofructokinase.

9) What is a cell line?

a) Multilayer culture.
b) Transformed cells.
c) Multiple growth of cells.
d) Sub culturing of primary culture.

10) Name the area of a bacterial cell which contains a bacterial chromosome:

a) DNA.
b) Nucleus.
c) Nucleoid.
d) Cell wall.

11) Which of the following vitamins cannot be produced by our body?

a) Vitamin A.
b) Vitamin K.
c) Vitamin C.
d) All of the above.

12) Which is the leading cause of blindness in children worldwide?

a) Glaucoma.
b) Cataracts.
c) Colour blindness.
d) Vitamin A deficiency.

13) Which of the following cell organelles is involved in the process of protein synthesis?

a) Vesicles.
b) Ribosomes.
c) Synchrotrons.
d) Mitochondria.

14)is a trace eliment:

a) Phosphorous.
b) Carbon.
c) Magnesium.
d) Sodium.

15) _____is a protein deficiency disorder:

a) Scurvy.
b) Anaemia.
c) Kwashiorkor.
d) None of the above.

16) A gene produced for recombinant DNA technology contains a gene from one organism joined to the regulatory sequence of another gene. Such a gene is called:

a) Oncogene.
b) Junk gene.
c) Chimeric gene.
d) None.

17) Which of the following factors is not responsible for the denaturation of proteins?

a) Heat.
b) Charge.
c) pH change.
d) Organic solvents.

18) Which of the following DNA mutation that result in appearance of a stop codon in resulting mRNA:

a) Transition.
b) Nonsense mutation.
c) Silent mutation.
d) Missense mutation.

19) Name the vitamin which takes part in blood clotting?

a) Vitamin E.
b) Vitamin K.
c) Vitamin D.
d) Folic acid.

20) Which of the following enzyme would you select for cutting a DNA strand with recognition sequence "GAATTC":

a) T4 ligase.
b) Taq polymerase.
c) EcoR1.
d) Alu1.

21) An enzyme which synthesis, DNA from RNA is called_____:
a) DNA polymerase.
b) RNA polymerase.
c) Nucleases.
d) Reverse transcriptase.

22) Which of the following microtubule pulls the chromosomes towards pole?
a) Astral.
b) Polar.
c) Kinetochore.
d) Centrioles.

23) Damage and errors in DNA cause_____:
a) Mutation.
b) DNA repair.
c) Translation.
d) Transcription.

24) Which of the following antibody gives a primary immune reaction?
a) IgG.
b) IgM.
c) IgA.
d) IgE.

25) Which of the following is the most essential nutrient for a woman during her initial stages of pregnancy to prevent birth defects?
a) Thiamin.
b) Folic acid.
c) Vitamin C.
d) Vitamin E.

26) Alteration in which of the following chromosome shows Down syndrome?
a) Sex chromosome.
b) 18.
c) 21.
d) 13.

27) Which of the following mechanisms of DNA polymerase helps in preventing error during DNA replication?
a) Rechecking.
b) Proof checking.
c) Proof reading.
d) All of these.

28) The distortion in DNA helix due to pyrimidine dimer formation is calledas:
a) Nick.
b) Single strand break.
c) Kink.
d) None of these.

29) Which of the following hormones is responsible for increasing gluconeogenesis in the liver during prolonged starvation?
a) TSH.
b) Insulin.
c) Thyroxine.
d) Glucagon.

30) A point mutation that replaces a purine with another purine, or a pyrimidine with another pyrimidine:
a) Transition.
b) Transversion.
c) Silent mutation.
d) Missense mutation.

31) In both prokaryotic and eukaryotic cells, the synthesis of protein chains is initiated with:

a) Arginine.
b) Methionine.
c) Serine.
d) Valine.

32) The zymogen is an inactive precursor of an active enzyme:

a) Also called pro-enzyme.
b) Also called pre-enzyme.
c) Known as Iso-enzyme
d) None of the above

33) All transposons encode a_____which catalyzes the insertion:

a) DNA glycosylase.
b) Excisionase.
c) Transposase.
d) DNA polymerase.

34) In terms of DNA and RNA structure, what is a nucleotide?

a) A nucleotide is a heterocyclic base.
b) A nucleotide is a sugar molecule covalently bonded to a heterocyclic base.
c) A nucleotide is a sugar molecule bonded to phosphate group/s and a heterocyclic base.
d) A nucleotide is a heterocyclic base bonded to phosphate group/s.

35) Which of the following is a type of autosomal recessive genetic disorder?

a) Haemophilia.
b) Skeletal dysplasia.
c) Sickle cell anaemia.
d) None of the above.

36) Which of the following is the characteristic of a cancer cell?

a) Density dependent inhibition.
b) Contact inhibition.
c) Loss of anchorage dependence.
d) Apoptosis.

37) Name the state where non dividing cells of neurons and skeletal muscle present?

a) G0.
b) G1.
c) G2.
d) M.

38) The 3-D structure of proteins can be determined by:

a) Spectroscopy.
b) X-ray crystallography.
c) Nuclear magnetic resonance.
d) Both (b) and (c).

39) The bases are held together in a DNA double helix by hydrogen bonds. These bondsare:

a) Ionic bonds.
b) Covalent bonds.
c) Non-covalent bonds.
d) Van der Waals forces.

40) What is microsome?

a) Compartment of Golgi.
b) Smaller ribosomes.
c) Small ER compartments.
d) Small vesicles of fragmented ER.

41) The enzyme required for transcription is:

a) RNAase.
b) DNA polymerase.
c) RNA polymerase.
d) Restriction enzymes.

42) What is a bond between amino acids called?

a) Ionic bond.
b) Acidic bond.
c) Peptide bond.
d) Hydrogen bond.

43) Name the tissues that are involved in the formation of membranes:

a) Epithelial tissue.
b) Nervous tissue.
c) Muscular tissue.
d) Connective tissue.

44) Transcription is the transfer of genetic information from:

a) DNA to RNA.
b) DNA to mRNA.
c) mRNA to tRNA.
d) tRNA to mRNA.

45) Small DNA sequences that can move to virtually any position in a cell's genome:

a) Exons.
b) Introns.
c) Egulons.
d) Transposons.

46) What is DNA replication:

a) Conservative.
b) Non-conservative.
c) Semi-conservative.
d) None of the mentioned.

47) Which of the following vitamin helps in blood clotting?

a) Vitamin A.
b) Vitamin C.
c) Vitamin D.
d) Vitamin K.

48) Excessive intake of calcium in our diet results in_____:

a) Stroke.
b) Diarrhoea.
c) Constipation.
d) Kidney stones.

49) Name the major storage form of carbohydrates in animals?

a) Cellulose.
b) Chitin.
c) Glycogen.
d) Starch.

50) Which of the following cell is a multipotent cell?

a) T-cell.
b) B-cell.
c) HSC.
d) Monocytes.

51) Circular DNA used for cloningis called_____:

a) DNA polymerase.
b) RNA polymerase.
c) Phagosome.
d) Plasmid.

52) Name the RNA molecule which takes part in the formation of the ribosome?

a) mRNA.
b) tRNA.
c) rRNA.
d) gRNA.

53) PCR technique was invented by:

a) Karry Mullis.
b) Boyer.
c) Sanger.
d) Cohn.

54) Which of the following vitamin deficiency causes Beriberi?

a) Vitamin B1.
b) Vitamin B2.
c) Vitamin B6.
d) Vitamin B12.

55) The small intestine has three parts. The first part is called:

a) Duodenum.
b) Oesophagus.
c) Larynx.
d) None of the above.

56) Which of the following metabolites negatively regulates pyruvate kinase?

a) Citrate.
b) Alanine.
c) Acetyl CoA.
d) Fructose-1,6-Bisphosphate.

57) Which of the following statements is true of DNA damage?

a) All DNA damage results in diseases such as cancer.
b) Most DNA damage is repaired by the cell.
c) All DNA damage is caused by physical, chemical or biological agents.
d) Most DNA damage is advantageous to the cell.

58) Name the term which defines the presence or absence of extra copies of a few chromosomes:

a) Extranuclear inheritance.
b) Aneuploidy.
c) Euploidy.
d) Diploid.

59) DNA polymerase synthesizes:

a) DNA in 5'-3' direction.
b) DNA in 3'-5' direction
c) mRNA in 3'-5' direction.
d) mRNA in 5'-3' direction

60) Which of the following is a component of the coenzyme A?

a) Retinol.
b) Pyridoxine.
c) Retinoic acid.
d) Pantothenic acid.

61) Which of the following statements is known as the rate-limiting step in glycolysis?

a) Enolase.
b) Phosphofructokinase.
c) Phosphohexose isomerase.
d) Glyceraldehyde-3-phosphate dehydrogenase.

62) Onions, broccoli, fresh fruits, milk, eggs, iodized salt are good sources of:

a) Phosphorus.
b) Sodium.
c) Iodine.
d) Both (b) and (c).

63) Conversion of messages carried by mRNA into amino acid sequences is called_____:

a) Replication.
b) DNA repair.
c) Translation.
d) Transcription.

64) _____are the elements, without which, the plants will not be able to complete its life cycle:

a) Fertilizers.
b) Microelements.
c) Macroelements
d) Essential elements.

65) Which of the following enzymes is defective in galactosemia- a fatal genetic disorder in infants?

a) Glucokinase.
b) Galactokinase.
c) UDP-Galactose 4- epimerase.
d) Galactose-1-Phosphate Uridyltransferase.

66) The basic structure of antibodies are_____:

a) Y-shaped.
b) X-shaped.
c) Linear.
d) Hyperbolic.

67) Which form of DNA is described by Watson-Crick model?

a) B-DNA.
b) Z-DNA.
c) A-DNA.
d) Quadraplex DNA.

68) Which of the following is true about enzymes?

a) Proteins.
b) Nucleic acids.
c) Carbohydrates.
d) DNA molecule.

69) There are _____ essential amino acids:

a) 10.
b) 20.
c) 30.
d) 50.

70) Which of the following are examples of macro minerals?

a) Sodium.
b) Calcium.
c) Chloride.
d) All of the above.

71) The fragments of DNA are joined together by which of the following enzymes:
a) Endonuclease.
b) DNA polymerase.
c) Primase.
d) Ligase.

72) Which of the following is NOT a cloning vector?
a) Bacterial plasmid.
b) Cosmids.
c) Bacteriophage.
d) E.coli.

73) What is an allele?
a) Characteristics of an organism.
b) Alternate forms of genes.
c) Homologous chromosomes.
d) Pair of centrioles.

74) Name the protein, which is responsible for the formation of RNA primer?
a) Topoisomerase.
b) Gyrase.
c) Helicase.
d) Primase.

75) Passion fruit and pomegranate are rich in which mineral?
a) Phosphorous.
b) Calcium.
c) Manganese.
d) None of the above.

76) The tendency of two or more than two genes to stay together during inheritance is called _____:
a) Genetics.
b) Gene interaction.
c) Crossing over.
d) Linkage.

77) _____ is an important mineral nutrient:
a) Hydrogen.
b) Nitrogen.
c) Oxygen.
d) Carbon.

78) Taq polymerase requires:
a) A free end for adding complimentary nucleotides.
b) A free 3-OH end for adding complimentary nucleotides.
c) A free 5-P end for adding complimentary nucleotides.
d) Adds complimentary nucleotides to both 3'OH end and 5'P end.

79) What is the name of the tissues which helps in protection and support of the body?
a) Muscular tissue.
b) Nervous tissue.
c) Connective tissue.
d) Epithelial tissue.

80) Name the bacterium from which Taq DNA polymerase derived?
a) Thermus aquaticus.
b) Salmonella.
c) Cyanobacteria.
d) E.coli.

81) Which of the following is not an aerobic reaction?

a) Glycolysis.
b) Citric acid cycle.
c) Oxidative phosphorylation.
d) Fermentation.

82) The final step of gene expression is protein synthesis, which is also known as:

a) Replication.
b) Translation.
c) Transcription.
d) None of these.

83) Name the process by which a malignant cell spread throughout normal tissue?

a) Transformation.
b) Metastasis.
c) Invasiveness.
d) Progression.

84) Which of the following is responsible for specifying the 3D shape of a protein?

a) The peptide bond.
b) The amino acid sequence.
c) Interaction with other polypeptides.
d) Interaction with molecular chaperons.

85) Which of the following is a tricarboxylic acid?

a) Acetic acid.
b) Succinic acid.
c) Oxaloacetic acid.
d) Citric acid.

86) A point mutation that involves a purine being replaced by a pyrimidine, or vice versa:

a) Transition.
b) Transversion.
c) Silent mutation.
d) Missense mutation.

87) Which of the following vitamin is stored in the liver?

a) Vitamin K.
b) Vitamin D.
c) Vitamin E.
d) All of the above.

88) Which of the following proteins was first sequenced by Frederick Sanger?

a) Myosin.
b) Insulin.
c) Myoglobin.
d) Haemoglobin.

89) Which of the following statements is true about proteins?

a) Proteins are polymers of glucose.
b) Proteins are polymers of amino acids.
c) Proteins are polymers of peptide bonds.
d) Proteins are polymers of disulfide bridges.

90) What is the average molecular weight of an amino acid residue in a protein?

a) 120.
b) 110.
c) 130.
d) 140.

91) Which of the following glycolytic enzyme is inhibited by an accumulation of long-chain fatty acid in the liver?

a) Glucokinase.
b) Hexokinase.
c) Pyruvate kinase.
d) Phosphofructokinase.

92) End of eukaryotic chromosome is called:

a) Centromere.
b) Telomere.
c) Telomerase.
d) Microsatellite.

93) What is the origin of B-cell?

a) Pancreas.
b) Liver.
c) Thymus.
d) Bone marrow.

94) Which of the following is considered as a start codon?

a) AUG.
b) GUG.
c) UAG.
d) AGG.

95) Which of the following statements is true about proteins?

a) Proteins are made up of amino acids.
b) Proteins are essential for the development of skin, teeth and bones.
c) Protein is the only nutrient that can build, repair and maintain body tissues.
d) All of the above.

96) Which of the following enzymes are not involved in galactose metabolism?

a) Galactokinase.
b) Glucokinase.
c) Galactose-I-Phosphate Uridyltransferase.
d) UDP-Galactose 4epimerase.

97) _____is not a classified form of conjugated proteins:

a) Lipoproteins.
b) Glycoproteins.
c) Metalloproteins.
d) Complete proteins.

98) Red blood cells are multinucleate in nature:

a) Always true.
b) Always false.
c) Only when those are mature
d) Only when those are immature

99) Which of the following act as template for process of protein synthesis that takes place on ribosomes?

a) rRNA.
b) DNA.
c) tRNA.
d) mRNA.

100) What is the net gain of ATP during the conversion of glucose to pyruvate?

a) 2 ATP.
b) 4 ATP.
c) 6 ATP.
d) 1 ATP +1 GTP.