

JEPAS(PG)-2021

1101900001

**Subject: M. Sc in Medical Biotechnology (M. Sc BT)**

**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,  $\frac{1}{4}$  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 answers only in the space provided. Do not make any stray mark on the OMR.
5. Write question booklet number and 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 question booklet number/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, log-table, wristwatch, any communication device like mobile phones etc. inside the examination hall. Any candidate found with such items will be **reported against** and 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. Structure of DNA and protein found in the nucleus of eukaryotic cells
  - a) Nucleic acid.
  - b) Nucleosome.
  - c) Chromatin.
  - d) Tetraplex.
  
2. What is the origin of B-cell?
  - a) Pancreas.
  - b) Liver.
  - c) Thymus.
  - d) Bone marrow.
  
3. What is the permeability of the plasma membrane?
  - a) Selectively permeable.
  - b) Impermeable.
  - c) Single phase flow.
  - d) Highly permeable.
  
4. Which of the following is described by the fluid mosaic model?
  - a) Nucleus.
  - b) Plasma membrane.
  - c) Endoplasmic reticulum.
  - d) Ribosome.
  
5. An enzyme which synthesis, DNA from RNA is called
  - a) DNA polymerase.
  - b) RNA polymerase.
  - c) Nucleases.
  - d) Reverse transcriptase.
  
6. Name the bacterium from which Taq DNA polymerase is derived?
  - a) Thermus aquaticus.
  - b) Salmonella.
  - c) Cyanobacteria.
  - d) E.coli.
  
7. Genetic information stored in mRNA is translated to polypeptide by
  - a) Ribosome.
  - b) Nucleus.
  - c) Endoplasmic reticulum.
  - d) Golgi apparatus.
  
8. Respiration is a
  - a) Oxidative process.
  - b) Reductive process.
  - c) Catabolite repression.
  - d) Intermediate process.

9. What is the nature of an enzyme?
  - a) Vitamin.
  - b) Lipid.
  - c) Carbohydrate.
  - d) Protein.
  
10. Name the RNA molecules which is used to carry genetic information copied from DNA?
  - a) tRNA.
  - b) mRNA.
  - c) rRNA.
  - d) snRNA.
  
11. Name the control center of the eukaryotic cell?
  - a) Nucleus.
  - b) Ribosome.
  - c) Cytoplasm.
  - d) Golgi complex.
  
12. Out of the following, which is a major secretory layer of the GI tract?
  - a) Mucosa.
  - b) Submucosa.
  - c) Muscularis.
  - d) Serosa.
  
13. Who described the structure of DNA double helix?
  - a) Peter Mitchell.
  - b) Andre Jagendorf.
  - c) Ernest Uribe.
  - d) Watson and Crick.
  
14. Name the part of a chromosome where t-loop is found.
  - a) Telomere.
  - b) Centromere.
  - c) Acromere.
  - d) Tetraplex.
  
15. Name the unit of replication?
  - a) DNA.
  - b) Gene.
  - c) Replicon.
  - d) Chromosome.
  
16. Endoplasmic reticulum membrane which is associated with ribosomes is called
  - a) ER lumen.
  - b) Smooth endoplasmic reticulum.
  - c) Rough endoplasmic reticulum.
  - d) Endosome.

17. Name the type of cell division in which daughter cells receive an exact copy of chromosomes from parent cell?
- Mitosis.
  - Cleavage.
  - Interphase.
  - Meiosis.
18. Resting phase of the cell, where it undergoes growth and DNA replication is called
- Mitosis phase.
  - G1 phase.
  - Interphase.
  - M phase.
19. Which one is a sex linked disorder?
- Cancer.
  - Night blindness.
  - Colour blindness.
  - Leukaemia.
20. Name the process of transition from normal cells to cancerous cells?
- Ubiquitylation.
  - Polymerization.
  - Transformation.
  - Metastasis.
21. Which of the following cells has a high affinity receptor for IgE?
- Dendritic cell.
  - Mast cells.
  - Eosinophils.
  - Basophils.
22. The monomeric unit of nucleic acid are called
- Nucleotides.
  - Nucleosides.
  - Pyrimidines.
  - Purines.
23. Mark the one, which is NOT the precursor of the hormone?
- Amino acids.
  - Cholesterol.
  - Phospholipids.
  - Proteins.
24. Name the hormone which is at peak during ovulation.
- Progesterone.
  - Estrogen.
  - FSH.
  - LH.

25. Oxygen and hemoglobin bind in a reversible manner to form
- Carboxyhemoglobin.
  - Oxyhemoglobin.
  - Methemoglobin.
  - BPG.
26. In eukaryotic cells, major part of ATP formation occurs in the:
- Golgi apparatus.
  - Endoplasmic Reticulum.
  - Mitochondria.
  - DNA.
27. In our body, calcium plays a key role in:
- Muscle contraction.
  - Blood clotting.
  - Conduction of nerve impulse.
  - All of the above.
28. Lemon contains high concentration of:
- Ascorbic acid.
  - Citric acid.
  - Lactic acid.
  - Amino acid.
29. 'Km value' is related to:
- Enzyme activity.
  - pH activity.
  - Osmolar activity.
  - Solvent activity.
30. Deficiency of Vitamin A in our diet leads to:
- Color blindness.
  - Night blindness.
  - Cataract.
  - Opacity of cornea.
31. Buffers are solutions which can resist changes in:
- Osmolality.
  - Solubility.
  - pH.
  - None of the above.
32. Which vitamin has maximum anti-oxidant activity in our body?
- Vitamin A.
  - Vitamin B12.
  - Vitamin D.
  - Vitamin E.

33. Complete oxidation of glucose through glycolysis process will yield a net:
- 32 ATPs.
  - 34 ATPs.
  - 38 ATPs.
  - 40 ATPs.
34. Hemoglobin is a conjugated protein with:
- 2 subunits.
  - 4 subunits.
  - 6 subunits.
  - 8 subunits.
35. Following hormones are steroids, except:
- Estrogen.
  - Testosterone.
  - Oxytocin.
  - Cortisol.
36. Hormone-receptor complex causes the formation of intracellular mediator called:
- First Messenger.
  - Second Messenger.
  - Bradykinin.
  - None of the above.
37. Nucleus is present in all the cells in the body except:
- RBC.
  - WBC.
  - Neuron.
  - Cardiac cell.
38. Inhibitory effect of oxygen on glycolysis is known as:
- Pasteur effect.
  - Crabtree effect.
  - Haldane effect.
  - Bohr effect.
39. Name one vitamin which contains cobalt:
- Vitamin B2.
  - Vitamin B6.
  - Vitamin B12.
  - Vitamin K.
40. From the intestine, glucose is absorbed by the mechanism of:
- Facilitated diffusion.
  - Simple diffusion.
  - Sodium cotransport.
  - Receptor-mediated endocytosis.

41. Activation of vitamin D3 requires the help of:
- Sunlight.
  - Liver.
  - Kidney.
  - Liver and kidney.
42. Most amino acids in the body are alpha amino acids except:
- Threonine.
  - Cysteine.
  - Proline.
  - Tyrosine.
43. Lipid of the cell membrane is chiefly:
- Phospholipid.
  - Cholesterol.
  - Triglyceride.
  - None of the above.
44. Antigen presenting cell is a:
- T lymphocyte.
  - B lymphocyte.
  - Macrophage.
  - All of the above.
45. Vitamin E is an:
- Anti-atherosclerotic agent.
  - Anti-cancer agent.
  - Anti-oxidant agent.
  - None of the above.
46. The end product of aerobic glycolysis is:
- Lactic acid.
  - Pyruvic acid.
  - Citric acid.
  - None of the above.
47. Which trace element is the constituent of enzyme glutathione peroxidase?
- Chromium.
  - Selenium.
  - Cobalt.
  - Manganese.
48. Ribosomes of the cell synthesize:
- Protein.
  - Steroid hormones.
  - Both.
  - None of the above.



49. Erythropoietin is produced by the:
- Liver.
  - Kidney.
  - Adrenal.
  - Pineal gland.
50. A virus infected cell is destroyed by:
- Neutrophil.
  - T lymphocyte.
  - B lymphocyte.
  - Basophil.
51. Receptors of protein hormones are present in target cell:
- Membrane.
  - Cytosol.
  - Nucleus.
  - DNA.
52. Sphygmomanometer is used for measuring:
- Respiratory rate.
  - Heart rate.
  - Blood pressure.
  - Blood volume.
53. Ovulation, in a normal menstrual cycle, usually occurs on about:
- 7<sup>th</sup> day.
  - 14<sup>th</sup> day.
  - 21<sup>st</sup> day.
  - 28<sup>th</sup> day.
54. Body Mass Index (BMI), in a healthy person should not exceed:
- 15.
  - 20.
  - 25.
  - 30.
55. Biuret reaction is test for qualitative detection of:
- Carbohydrate.
  - Protein.
  - Fat.
  - None of the above.
56. Among the following chemicals, which one has anticoagulant activity?
- MUFA.
  - PUFA.
  - EDTA.
  - CCK.

57. Who was the inventor of ABO blood group system?  
a) Karl Landsteiner.  
b) Louis Pasteur.  
c) Alexander Fleming.  
d) Linus Pauling.
58. Dietary deficiency of vitamin B12 causes:  
a) Hemolytic anemia.  
b) Aplastic anemia.  
c) Pernicious anemia.  
d) Sickle cell anemia.
59. Following examples are of cytokines except:  
a) Interleukins.  
b) Interferons.  
c) Interneurons.  
d) Tumor necrosis factors.
60. In a cell, large number of granular particles attached to endoplasmic reticulum is called:  
a) Lysosomes.  
b) Ribosomes.  
c) Peroxisomes.  
d) None of the above.
61. Flame Photometer is an instrument used for detection of:  
a) Sodium and potassium.  
b) Calcium and lithium.  
c) Both (a) and (b).  
d) None of the above.
62. In RBCs, Krebs cycle cannot occur due to lack of:  
a) Mitochondria.  
b) Golgi body.  
c) Nucleus.  
d) Enzymes.
63. In our body, cochlea is associated with:  
a) Olfactory mechanism.  
b) Gustatory mechanism.  
c) Optical mechanism.  
d) Auditory mechanism.
64. Diabetes insipidus develop due to deficiency of:  
a) Insulin.  
b) Glucagon.  
c) ADH.  
d) PTH.

65. Most RNA virus carry a gene for an enzyme that uses viral RNA as a template in the synthesis of DNA is:
- RNA replicase.
  - Reverse trascriptase.
  - RNA polymerase.
  - Viral nuclease.
66. Most RNA virus carry a gene for an enzyme that uses viral RNA as a template in the synthesis of RNA is:
- RNA replicase.
  - Reverse transcriptase.
  - RNA polymerase.
  - Viral nuclease.
67. A piece of nucleic acid used to find a gene, by forming a hybrid with it, is called a
- Probe.
  - Vector.
  - Restriction sequence.
  - Retrovirus.
68. The recombinant DNA is cloned when:
- Cell divided by binary fission.
  - Only F+ plasmid get conjugated with F- plasmid.
  - DNA is cut by Restriction enzymes.
  - Selective pressure is present in media.
69. A Virion is a:
- Viral gene.
  - Viral ribosome.
  - Viral Lysosome.
  - Virus.
70. Viral gene are made of:
- RNA only.
  - Either RNA or DNA.
  - DNA only.
  - Either protein or nucleic acid.
71. The enzyme involved in viral replication are synthesized:
- On the viral ribosome.
  - On the interior surface of the viral membrane.
  - On the interior surface of the viral coat.
  - By the host cell.
72. DNA replication occurs in which in which phase of the cell cycle:
- Prophase.
  - Telophase.
  - Anaphase.
  - Interphase.

73. The regulatory enzyme in fatty acid biosynthesis is:
- Acyl CoA dehydrogenase.
  - Enoyl CoA hydratase.
  - Ketothiolase.
  - Acyl CoA carboxylase.
74. In mammals elongation of fatty acid beyond C16 takes place in:
- SER.
  - RER.
  - Golgi body.
  - Mitochondria.
75. Eukaryotes contains all of these except:
- Ribosomes.
  - Golgi body.
  - Nucleus.
  - Mesosome.
76. In which process cell to cell contact is required:
- Conjugation.
  - Transduction.
  - Transformation.
  - All of these.
77. In order to persist and be stably maintained in the cell, a plasmid DNA molecule must contain:
- Origin of replication.
  - Transfer gene.
  - Multiple cloning site.
  - None of these.
78. The function of cellular respiration is to:
- Prepare ATP.
  - Prepare NADH.
  - Get rid of glucose.
  - Get rid of Carbon dioxide.
79. Following constitute dietary fibres except
- Pectin.
  - Mitochondria.
  - Riboflavin.
  - Hemi cellulose.
80. The property of protein to absorb UV rays of light due to
- Peptide bond.
  - Amino group.
  - Di-sulphide bond.
  - Aromatic amino acid.

81. Strongest bond out of the following
- Electrostatic.
  - Hydrophobic.
  - Hydrophilic.
  - Van der waals.
82. Rough endoplasmic reticulum is the site for synthesis of
- Protein.
  - Cholesterol.
  - Carbohydrate.
  - Fat.
83. Not a dietary source of vitamin B12
- Fish.
  - Meat.
  - Soya bean.
  - Liver.
84. Life span of RBC is
- 90 days.
  - 60 days.
  - 120 days.
  - 100 days.
85. Which of the following disease is water borne
- Tuberculosis.
  - AIDS.
  - Malaria.
  - None of these.
86. The glomerulus of the kidney is a
- Nervous structure.
  - Vascular structure.
  - None of these.
  - All of these.
87. Which of these is not a sexually transmitted disease
- AIDS.
  - Syphilis.
  - Leprosy.
  - Gonorrhoea.
88. Pneumonia is an infection of
- Kidney.
  - Liver.
  - Lung.
  - Skin.

89. Yellow coloration of skin and sclera by bilirubin is
- Hypertension.
  - Jaundice.
  - Gout.
  - All of above.
90. PCR stands for
- Pus cell reaction.
  - Pus. creatinine red blood corpuscle.
  - Polymerase Chain Reaction.
  - None of these.
91. A protein has an isoelectric pH of 6. It is least soluble at pH
- 6.
  - 7.
  - 5.
  - 8.
92. Protein absorb UV light at the region of \_\_\_\_\_ nm.
- 240.
  - 260.
  - 280.
  - 300.
93. The most probable amino acid that do not occur at bends and turns of a polypeptide chain is:
- Proline.
  - Leucine.
  - Phenylalanine.
  - Tryptophan.
94. The bond stabilizing the primary structure of a protein
- Covalent bonds.
  - Ionic bonds.
  - Hydrogen bonds.
  - Covalent and Hydrogen bonds.
95. Enzymes in an enzymatic reaction do not interfere with
- Free energy of reaction.
  - Rate of reaction.
  - Activation energy of the transition state.
  - Reaction equilibrium.
96. Which of the following element plays an important role in nitrogen fixation
- Manganese.
  - Molybdenum.
  - Zinc.
  - Copper.

97. Which of the following is an uncharged amino acid
- a) Glutamic acid.
  - b) Asparagine.
  - c) Aspartic acid.
  - d) Lysine.
98. Among the following which amino acid does not absorb the wavelength of 250-300nm
- a) Tryptophan.
  - b) Phenylalanine.
  - c) Tyrosine.
  - d) Cysteine.
99. LDL and HDL are commonly known as \_\_\_\_\_ and \_\_\_\_\_ respectively.
- a) Good cholesterol and bad cholesterol.
  - b) Bad cholesterol and good cholesterol.
  - c) Assimilative cholesterol and oxidative cholesterol.
  - d) Oxidative cholesterol and assimilative cholesterol.
100. Water is .....
- a) Polar solvent.
  - b) Non-polar solvent.
  - c) Amphipathic solvent.
  - d) Non-polar uncharged solvent.

