

JEMAS(PG)-2022 **QB No: 2103000001**
Subject: M. Sc. in Medical Biotechnology (M. Sc BT)

Duration: 90 minutes

No of MCQ: 100

Full Marks: 100

Instructions

1. All questions are of objective type having four answer options for each, carry 1 mark each and only one option is correct. 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. Question booklet series code (A, B, C, or D) must be properly marked on the OMR.
3. Use only **Black/Blue ball point pen** to mark the answer by complete filling up of the respective bubbles.
4. Write question booklet number and your roll number carefully in the specified locations of the **OMR**. Also fill appropriate bubbles.
5. Write your name (in block letter), name of the examination center and put your full signature in appropriate boxes in the OMR.
6. 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 center. 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.
7. Candidates are not allowed to carry any written or printed material, calculator, 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** and his/her candidature will be summarily cancelled.
8. Rough work must be done on the question paper itself. Additional blank pages are given in the question paper for rough work.
9. Hand over the OMR to the invigilator before leaving the Examination Hall.



1. Which of the following vitamin is stored in the liver?
(A) Vitamin K.
(B) Vitamin D.
(C) Vitamin E.
(D) All of the above.
2. 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.
3. Which of the following minerals controls growth and body weight?
(A) Iodine.
(B) Calcium.
(C) Phosphorous.
(D) All of the above.
4. _____ helps in the regulation of blood volume and blood pressure:
(A) Iron.
(B) Iodine.
(C) Sodium.
(D) Phosphorous.
5. Which of the following are examples of macro minerals?
(A) Sodium.
(B) Calcium.
(C) Chloride.
(D) All of the above.
6. Excessive intake of calcium in our diet results in _____:
(A) Stroke.
(B) Diarrhoea.
(C) Constipation.
(D) Kidney stones.
7. Onions, broccoli, fresh fruits, milk, eggs, iodized salt are good sources of _____:
(A) Phosphorus.
(B) Sodium.
(C) Iodine.
(D) Both (B) and (C).
8. Which of the following enzymes are not involved in galactose metabolism?
(A) Galactokinase.
(B) Glucokinase.
(C) Galactose-1-Phosphate Uridyltransferase.
(D) UDP-Galactose 4- epimerase.

9. Passion fruit and pomegranate are rich in which mineral?
 - (A) Phosphorous.
 - (B) Calcium.
 - (C) Manganese.
 - (D) None of the above.

10. 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.

11. Which of the following enzyme deficiency leads to hemolytic anaemia?
 - (A) Glucokinase.
 - (B) Pyruvate Kinase.
 - (C) Phosphoglucomutase.
 - (D) Phosphofructokinase.

12. Which of the following is a tricarboxylic acid?
 - (A) Acetic acid.
 - (B) Succinic acid.
 - (C) Oxaloacetic acid.
 - (D) Citric acid.

13. Which of the following metabolites negatively regulates pyruvate kinase?
 - (A) Citrate.
 - (B) Alanine.
 - (C) Acetyl CoA.
 - (D) Fructose-1,6-Bisphosphate.

14. 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.

15. 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.

16. 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.

17. Which of the following hormones is responsible for increasing gluconeogenesis in the liver during prolonged starvation?
- (A) TSH
 - (B) Insulin.
 - (C) Thyroxine.
 - (D) Glucagon.
18. 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.
19. Which of the following vitamin helps in blood clotting?
- (A) Vitamin A.
 - (B) Vitamin C.
 - (C) Vitamin D.
 - (D) Vitamin K.
20. Which is the leading cause of blindness in children worldwide?
- (A) Glaucoma.
 - (B) Cataracts.
 - (C) Colour blindness.
 - (D) Vitamin A deficiency.
21. Which of the following vitamin deficiency causes Beriberi?
- (A) Vitamin B₁.
 - (B) Vitamin B₂.
 - (C) Vitamin B₆.
 - (D) Vitamin B₁₂.
22. Which of the following nutrient deficiency causes megaloblastic anaemia?
- (A) Folic acid.
 - (B) Niacin.
 - (C) Pyridoxine.
 - (D) Cobalamin.
23. Which of the following is a component of the coenzyme A?
- (A) Retinol.
 - (B) Pyridoxine.
 - (C) Retinoic acid.
 - (D) Pantothenic acid.
24. _____ 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.

25. _____ is an important mineral nutrient:
 (A) Hydrogen.
 (B) Nitrogen.
 (C) Oxygen.
 (D) Carbon.
26. _____ is a trace element:
 (A) Phosphorous.
 (B) Carbon.
 (C) Magnesium.
 (D) Iodine.
27. Which of the following factors is not responsible for the denaturation of proteins?
 (A) Heat.
 (B) Charge.
 (C) pH change.
 (D) Organic solvents.
28. 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.
29. _____ is not a classified form of conjugated proteins:
 (A) Lipoproteins.
 (B) Glycoproteins.
 (C) Metalloproteins.
 (D) Complete proteins.
30. What is the average molecular weight of an amino acid residue in a protein?
 (A) 120.
 (B) 110.
 (C) 130.
 (D) 140.
31. Which of the following proteins was first sequenced by Frederick Sanger?
 (A) Myosin.
 (B) Insulin.
 (C) Myoglobin.
 (D) Haemoglobin.
32. 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.

33. There are _____ essential amino acids:
 (A) 10.
 (B) 20.
 (C) 30.
 (D) 50.
34. What is a bond between amino acids called?
 (A) Ionic bond.
 (B) Acidic bond.
 (C) Peptide bond.
 (D) Hydrogen bond.
35. 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.
36. Which of the following cell organelles is involved in the process of protein synthesis?
 (A) Vesicles.
 (B) Ribosomes.
 (C) Synchrotrons.
 (D) Mitochondria.
37. 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).
38. Which of the following is true about enzymes?
 (A) Proteins.
 (B) Nucleic acids.
 (C) Carbohydrates.
 (D) DNA molecule.
39. The small intestine has three parts. The first part is called:
 (A) Duodenum.
 (B) Oesophagus.
 (C) Larynx.
 (D) None of the above.
40. _____ is a protein deficiency disorder:
 (A) Scurvy
 (B) Anaemia.
 (C) Kwashiorkor.
 (D) None of the above.

41. Rough endoplasmic reticulum is the site for synthesis of:
(A) Protein.
(B) Cholesterol.
(C) Carbohydrate.
(D) Fat.
42. Life span of RBC is:
(A) 90 days.
(B) 60 days.
(C) 120 days.
(D) 100 days.
43. The normal value of reticulocyte count is:
(A) 2%.
(B) 5%.
(C) 10%.
(D) 1%.
44. Which of the following disease is water borne?
(A) Tuberculosis.
(B) AIDS.
(C) Malaria.
(D) None of these.
45. Which of these is not a sexually transmitted disease?
(A) Cholera.
(B) Syphilis.
(C) Leprosy.
(D) Gonorrhoea.
46. Melanin pigment is formed from:
(A) Macrophage.
(B) Mandible.
(C) Meissner's plexus.
(D) Melanocytes.
47. The function of cellular respiration is to:
(A) Prepare ATP.
(B) Prepare NADH.
(C) Get rid of glucose.
(D) Get rid of carbon dioxide.
48. Following constitute dietary fibres except:
(A) Pectin.
(B) Mitochondria.
(C) Riboflavin.
(D) Hemi cellulose.

49. The property of protein to absorb UV rays of light due to:
(A) Peptide bond.
(B) Amino group.
(C) Di-sulphide bond.
(D) Aromatic amino acid.
50. Strongest bond out of the following:
(A) Electrostatic.
(B) Hydrophobic.
(C) Hydrophilic.
(D) Van der waals.
51. Melatonin is a hormone secreted from the:
(A) Adrenal gland.
(B) Parathyroid gland.
(C) Pituitary gland.
(D) Pineal gland.
52. Biuret reaction is the test for qualitative detection of:
(A) Carbohydrate.
(B) Protein.
(C) Fat.
(D) None of the above.
53. After complete oxidation, 1gm of fat yields how many Kcal of energy?
(A) 3.8.
(B) 4.1.
(C) 5.5.
(D) 9.5.
54. The major constituent of cell membrane is:
(A) Phospholipid.
(B) Protein.
(C) Carbohydrate.
(D) Cholesterol.
55. DNA estimation can be done by:
(A) Flame photometer.
(B) Sphygmomanometer.
(C) Spectrophotometer.
(D) Anemometer.
56. Buffers are solutions which can resist changes in:
(A) Osmolality.
(B) Solubility.
(C) pH.
(D) None of the above.

57. Predominant intracellular ions are:
(A) Na^+ .
(B) K^+ and PO_4^{--} .
(C) Cl^- .
(D) HCO_3^{--} .
58. The structural model of the cell membrane is often referred to as:
(A) Double Helix model.
(B) Cross-bridge model.
(C) Fluid-Mosaic model.
(D) Double-hinge model.
59. Flowing hormones are steroids, except:
(A) Estrogen.
(B) Testosterone.
(C) Cortisol.
(D) Oxytocin.
60. Which of the following bone does not contain the red marrow?
(A) Vertebrae.
(B) Clavicle.
(C) Sternum.
(D) Ribs.
61. In human body, nucleus is present in all the cells except:
(A) RBC.
(B) WBC.
(C) Neuron.
(D) Cardiac cell.
62. Among the following chemicals, which one has anticoagulant activity:
(A) MUFA.
(B) PUFA.
(C) EDTA.
(D) CCK.
63. In our body, cochlea is associated with:
(A) Olfactory mechanism.
(B) Auditory mechanism.
(C) Optical mechanism.
(D) Gustatory mechanism.
64. The most common cause of anemia in developing country is:
(A) Nutritional deficiency.
(B) Infection.
(C) Malignancy.
(D) Drugs.

65. Deficiency of Vitamin A in our diet leads to:
(A) Cataract.
(B) Color blindness.
(C) Night blindness.
(D) Corneal opacity.
66. Hormone-receptor complex causes the formation of intracellular mediator called:
(A) First Messenger.
(B) Second Messenger.
(C) Bradykinin.
(D) None of the above.
67. Name one vitamin which contains cobalt:
(A) Vitamin B₂.
(B) Vitamin B₆.
(C) Vitamin B₁₂.
(D) Vitamin K.
68. Most amino acids in the body are α -amino acids except:
(A) Treonine.
(B) Cysteine.
(C) Proline.
(D) Tyrosine.
69. Lifespan of leucocytes in blood is about:
(A) 4-6 minutes.
(B) 4-6 hours.
(C) 4-6 days.
(D) 4-6 months.
70. Ovulation in normal menstrual cycle, usually occurs on about:
(A) 7th day.
(B) 14th day.
(C) 21st day.
(D) 28th day.
71. Body Mass Index (BMI) in a normal healthy person should not exceed:
(A) 15.
(B) 20.
(C) 25.
(D) 30.
72. Dietary deficiency of Vitamin B₁₂ causes:
(A) Hemolytic anemia.
(B) Aplastic anemia.
(C) Pernicious anemia.
(D) Sickle-cell anemia.

73. 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.
74. In blood coagulation mechanism, activation of Factor X is necessary for:
- (A) Intrinsic pathway.
 - (B) Extrinsic pathway.
 - (C) Both (A) and (B).
 - (D) None of the above.
75. The end product of aerobic glycolysis is:
- (A) Lactic acid.
 - (B) Pyruvic acid.
 - (C) Citric acid.
 - (D) None of the above.
76. Vitamin E is an:
- (A) Anti-atherosclerotic agent.
 - (B) Anti-oxidant agent.
 - (C) Anti-coagulant agent.
 - (D) Anti-cancer agent.
77. Natural immunity mediated by cells involve all of the following, except:
- (A) T lymphocytes.
 - (B) Neutrophils.
 - (C) Monocytes.
 - (D) Macrophages.
78. Receptors of protein hormones are present in target cell:
- (A) Membrane.
 - (B) Cytosol.
 - (C) Nucleus.
 - (D) DNA.
79. 'Km value' is related to:
- (A) pH activity.
 - (B) Osmolar activity.
 - (C) Enzyme activity.
 - (D) Solvent activity.
80. Haemoglobin is a conjugated protein with:
- (A) 2 subunits.
 - (B) 4 subunits.
 - (C) 6 subunits.
 - (D) 8 subunits.

81. Diabetes insipidus develop due to deficiency of:
(A) Insulin.
(B) Glucagon.
(C) ADH.
(D) PTH.
82. Essential fatty acids include:
(A) Linoleic acid.
(B) Linolenic acid.
(C) Both (A) and (B).
(D) Oleic acid.
83. In RBCs, Krebs cycle cannot occur due to lack of:
(A) Mitochondria.
(B) Golgi body.
(C) Nucleus.
(D) Enzymes.
84. A virus infected cell is destroyed by:
(A) Neutrophil.
(B) T lymphocyte.
(C) B lymphocyte.
(D) Basophil.
85. In eukaryotic cells, major part of ATP formation occurs in:
(A) Golgi apparatus.
(B) Endoplasmic reticulum.
(C) Mitochondria.
(D) DNA.
86. From the intestine, glucose is absorbed by the mechanism of:
(A) Facilitated diffusion.
(B) Simple diffusion.
(C) Sodium co-transport.
(D) Receptor-mediated endocytosis.
87. Initiation of action potential occurs at:
(A) Dendrites.
(B) Cell body.
(C) Axon hillock.
(D) Axon terminal.
88. Activation of vitamin D₃ requires the help of:
(A) Sunlight.
(B) Liver.
(C) Liver and kidney.
(D) Kidney.

89. Citrus fruit like lemon contains high concentration of:
- (A) Ascorbic acid.
 - (B) Citric acid.
 - (C) Lactic acid.
 - (D) Acetic acid.
90. Following hormones are secreted from the anterior pituitary except:
- (A) Prolactin.
 - (B) Oxytocin.
 - (C) FSH.
 - (D) LH.
91. 'Sliding-filament Hypothesis' is related to:
- (A) Nerve conduction.
 - (B) Muscle contraction.
 - (C) Intestinal movement.
 - (D) Respiratory function.
92. Who was the inventor of ABO blood group system?
- (A) Karl Landsteiner.
 - (B) Louis Pasteur.
 - (C) Alexander Fleming.
 - (D) Linus Pauling.
93. In our body, calcium plays a key role in:
- (A) Muscle contraction.
 - (B) Blood coagulation.
 - (C) Bone formation.
 - (D) All of the above.
94. Point out one vitamin which contains the trace element cobalt:
- (A) Vitamin A.
 - (B) Vitamin B₂.
 - (C) Vitamin B₆.
 - (D) Vitamin B₁₂.
95. The term Apoptosis is related to:
- (A) Cell multiplication.
 - (B) Cell division.
 - (C) Cell death.
 - (D) Cell migration.
96. The first menstrual cycle in girl's life is called:
- (A) Menarche.
 - (B) Thelarche.
 - (C) Menopause.
 - (D) None of the above.

97. GnRH stimulates the anterior pituitary gland to release:
- (A) Growth hormone.
 - (B) FSH and LH.
 - (C) Prolactin.
 - (D) Oxytocin.
98. Biological clock includes:
- (A) Circadian rhythm.
 - (B) Trigantin rhythm.
 - (C) Both (a) and (b).
 - (D) None of the above.
99. In our body, vestibular apparatus of the internal ear is responsible for:
- (A) Auditory sensation.
 - (B) Olfactory sensation.
 - (C) Maintenance of cardiac rhythm.
 - (D) Maintenance of body equilibrium.
100. Which one is the smallest cell of the blood?
- (A) RBC.
 - (B) Neutrophil.
 - (C) Small lymphocyte.
 - (D) Platelet.

