

JEMAS(PG) – 2023 FRMTS

1. What are the three major types of cells found in amniotic fluid?
(A) Amniotic fluid specific, epitheloid and mesenchyme.
(B) Mesenchyme, epitheloid and fibroblastic.
(C) Mesenchyme, amniotic fluid specific and fibroblastic.
(D) Amniotic fluid, epitheloid and fibroblastic.
2. What type of stem cells are found in amniotic fluid?
(A) Pluripotent with some unipotent characters.
(B) Totipotent with some pluripotent characters.
(C) Unipotent with some multipotent like characters.
(D) Multipotent with some pluripotent like characters.
3. The pulmonary surfactant in the human lungs is produced by which subset of cells?
(A) Pneumocytes Type I.
(B) Pneumocytes type II.
(C) Variant clara cells.
(D) Transitional cuboidal non ciliated cells.
4. What is the analogue of CD34+ hematopoietic stem cells in mouse?
(A) SSEA-1.
(B) Tra-1-60.
(C) Sca-1 +.
(D) CD38+.
5. Mark the correct stem cells found in the intestinal epithelium :
(A) Crypt based columnar cells.
(B) Enterocytes.
(C) Paneth cells.
(D) Goblet cells.
6. Mesenchymal stem cells are derived from which layer during the time of embryonic development?
(A) Endoderm.
(B) Ectoderm.
(C) Mesoderm.
(D) Neuroectoderm.
7. Hematopoietic stem cells are derived from which layer during the time embryonic development?
(A) Mesoderm.
(B) Endoderm.
(C) Neuroectoderm.
(D) Trophoectoderm.
8. What is creatinine and how it is produced in the body?
(A) Creatinine is a breakdown product of creatinine phosphate from muscle and protein metabolism.
(B) Creatinine is a breakdown product of creatinine phosphate from muscle and drug metabolism.
(C) Creatinine is a breakdown product of creatinine produced in the liver.
(D) Creatinine is a breakdown product of creatinine phosphate produced in the liver.

9. Creatinine is a breakdown product of creatinine phosphate produced in the liver:
 - (A) Chondrocytes.
 - (B) Hepatocytes.
 - (C) Thymocytes.
 - (D) Adipocytes.

10. For doing any clinical research for licensing the clinical trials with which organizations?
 - (A) CDSCO.
 - (B) DCGI.
 - (C) ICMR.
 - (D) NAC-SCRT.

11. What is hemiplegia?
 - (A) Muscle weakness or partial paralysis on one side of the body that can affect the arms, legs and facial muscles.
 - (B) Muscle weakness or partial paralysis on both sides of the body that can affect the arms, legs and facial muscles.
 - (C) Paralysis that affects all or part of the torso, legs and pelvic organs.
 - (D) Paralysis that affects both upper and lower limbs.

12. Why are adjuvants added in vaccines?
 - (A) It helps to decrease the response of the antibody towards the antigen.
 - (B) It helps to decrease the response of the NK cells towards the antigen.
 - (C) It helps to increase the immunogenicity or antigenicity of an antigen.
 - (D) It helps to decrease the immunogenicity of an antigen.

13. The chorion part of the amniotic membrane is rich in which type of stem cells?
 - (A) Very small embryonic stem cells.
 - (B) Embryonic stem cells.
 - (C) Epithelial stem cells.
 - (D) Mesenchymal stem cells.

14. Why porosity in scaffolds for tissue engineering is extremely important?
 - (A) To allow the extracellular matrix to make contact with each other.
 - (B) It gives coarseness to the scaffold.
 - (C) It helps in the seeding of cells with increased proliferation and gaseous exchange.
 - (D) It helps in the mechanical and tensile strength of the scaffold.

15. Cord blood is predominantly rich in which type of cells?
 - (A) Mesenchymal stem cells.
 - (B) Hematopoietic stem cells.
 - (C) Endothelial progenitor cells.
 - (D) Very small embryonic like stem cells.

16. Why do SCID mice lack?
 - (A) They lack mature and functional NK and CD4T helper cells.
 - (B) SCID mice lack matured and functional B and T cells.
 - (C) SCID mice lack mature and functional plasma cells and B cells.
 - (D) SCID mice are an attractive tool for xenogeneic transplantation studies.

17. Why are severe combined immune deficient mice an attractive biological animal model in stem cell transplantation studies?
- (A) SCID mice are an attractive tool for autologous transplantation as they do not reject any cells.
 - (B) SCID mice are an attractive tool for allogenic transplantation as they do not reject any cells.
 - (C) SCID mice are an attractive tool for syngeneic transplantation studies.
 - (D) SCID mice are an attractive tool for xenogeneic transplantation studies.
18. Lymphopoiesis gives rise to?
- (A) Monocytes, granulocytes and agranulocytes.
 - (B) Monocytes, NK cells and granulocytes.
 - (C) B cells & T cells, NK cells and certain dendritic cells.
 - (D) Plasma cells, macrophages and agranulocytes.
19. Cystic Fibrosis is what type of genetic disease?
- (A) Sex linked recessive disorder.
 - (B) Autosomal dominant disorder.
 - (C) Sex linked dominant disorder.
 - (D) Autosomal recessive disorder.
20. Select a foodborne toxin :
- (A) Botulinum toxin.
 - (B) Tetanus toxin.
 - (C) Diphtheria toxin.
 - (D) Cholera toxin.
21. Lysosomes are also known as “sucidical bag” because?
- (A) Parasitic activity.
 - (B) Hydrolytic activity.
 - (C) Catalytic activity.
 - (D) Presence of food vacuole.
22. The zone pellucida disintegrates just :
- (A) Before fertilization.
 - (B) After fertilization.
 - (C) Midway during cleavage.
 - (D) After completion of cleavage.
23. What is graft versus host disease?
- (A) GVHD occurs when the donor’s T cells (the graft) view the patient’s healthy cells (the host) as foreign, and attack and damage them
 - (B) GVHD occurs when the donor’s B cells (the graft) view the patient’s healthy cells (the host) as foreign, and attack and damage them.
 - (C) GVHD occurs when the donor’s NK cells (the graft) view the patient’s healthy cells (the host) as foreign, and attack and damage them.
 - (D) GVHD occurs when the donor’s T cells (the graft) view the patient’s healthy cells (the host) as foreign, and attack and damage them.

24. CD molecules are often used to identify and characterize specific group of cells. What is the full form of CD?
- (A) Cluster of differentiation molecules.
 - (B) Cluster of developing molecules.
 - (C) Cluster of dividing molecules.
 - (D) Cluster of denatured molecules.
25. Why does cord blood has high oxygen carrying affinity?
- (A) Due to high concentration of 2,3Diphosphoglyceric acid.
 - (B) Due to low concentration of 2,3Diphosphoglyceric acid.
 - (C) Due to presence of two Beta sub units in the HbF.
 - (D) Due to presence of two Delta sub units in the HbF.
26. What are the factors that are responsible for somatic cell ageing?
- (A) Shortening of the telomeric length.
 - (B) Mitochondrial ageing and oxidative stress.
 - (C) Damage due to DNA methylation.
 - (D) All the above.
27. Name the type of bone cell that is responsible for maintaining the stemness of the human bone?
- (A) Osteoblast.
 - (B) Osteoclast.
 - (C) Osteocyte.
 - (D) Osteogenic cells.
28. What are the implications of fast cooling during cryopreservation cells?
- (A) Dehydration of the cells resulting in solution injury.
 - (B) Intracellular ice formation resulting in injury to the cell.
 - (C) Fast cooling is a preferred method because neither dehydration nor intracellular ice formation will take place.
 - (D) Cell will undergo differentiation.
29. Downs Syndrome is best defined as?
- (A) A genetic disorder where abnormal cell division occurs when there is an extra copy of chromosomes no 20.
 - (B) A genetic disorder where abnormal cell division occurs when there is an extra copy of chromosomes no 22.
 - (C) A genetic disorder where abnormal cell division occurs when there is an extra copy of chromosomes no 21 or trisomy.
 - (D) A genetic disorder where abnormal cell division occurs when there is an extra copy of sex chromosomes in male only.
30. Which of the following HLA plays a major role in immune pregnancy tolerance?
- (A) HLA-A & HLA-B.
 - (B) HLA-DP,DQ.
 - (C) HLA-G.
 - (D) HLA-C.

31. What is Barr Body?
- (A) The inactivated X chromosome present in female Sex chromosomes.
 - (B) The activated Y chromosomes present in males.
 - (C) The Inactive Y chromosomes present in males.
 - (D) The inactivated X chromosomes present in the females autosomes.
32. In humans the first haematopoiesis initiates from?
- (A) Amniotic sac.
 - (B) Yolk sac.
 - (C) Liver.
 - (D) Thymus.
33. Stem cells from the dental pulp can be defined as which type of stem cells?
- (A) Dental pulp stem cells.
 - (B) Dental stem cells.
 - (C) Pulp stem cells.
 - (D) Dental derived stem cells.
34. One of the classical markers for hematopoietic stem cell identification and isolation cells?
- (A) CD38+.
 - (B) CD34+.
 - (C) Stro-1.
 - (D) SSEA-1.
35. In a cord blood bank, which part of the cord blood is stored?
- (A) Whole blood cord.
 - (B) Buffy coat.
 - (C) Platelet rich plasma.
 - (D) Mono-nuclear cell.
36. Which of the following enzymes in glycolytic pathway is inhibited by fluoride?
- (A) Glycerol dehyde – 3p dehydrogenase.
 - (B) Phosphoglycerate Kinase.
 - (C) Pyruvate Kinase.
 - (D) Enolase.
37. How burn injuries are classified?
- (A) Superficial and full thickness burn.
 - (B) Partial and full thickness burn.
 - (C) Superficial and partial burn.
 - (D) Superficial, partial and full thickness burn.
38. The absorption of Glucose in the digestive tract?
- (A) occurs in small intestine.
 - (B) is stimulated by hormone glucagon.
 - (C) occurs max rapidly than the absorption of any other sugar.
 - (D) is impaired in case of diabetes mellitus.

39. Human amnion part of the amniotic membrane contains a special type of stem cells. Label the correct option?
- (A) Mesenchymal stem cells.
 - (B) Amniocytes.
 - (C) Very small embryonic stem cells.
 - (D) Epithelial stem cells.
40. What does VDRL stand for?
- (A) Veneral disease research laboratory test.
 - (B) Veneral disease and laboratory test.
 - (C) Vitamin Edisease research laboratory.
 - (D) Veneral disease and research laboratory test.
41. Which metal is present in haemoglobin?
- (A) Copper.
 - (B) Iron.
 - (C) Manganese.
 - (D) Zinc.
42. Name the gas which is important for photosynthesis :
- (A) Oxygen.
 - (B) Carbon dioxide.
 - (C) Nitrogen.
 - (D) Carbon Monoxide.
43. Plants purify the air by which process?
- (A) Desiccation.
 - (B) Respiration.
 - (C) Photosynthesis.
 - (D) Transpiration.
44. Which cell has axons and dendrites?
- (A) Neuron.
 - (B) WBC.
 - (C) Platelets.
 - (D) RBC.
45. Which of the following is the smallest bone in the human body?
- (A) Femur.
 - (B) Stapes.
 - (C) Patella.
 - (D) None of these.
46. Which part of the human respiratory system provides a surface for the exchange of gases?
- (A) Alveoli.
 - (B) Bronchioles.
 - (C) Bronchi.
 - (D) Trachea.

47. The major excretory product in human is:
(A) Urea.
(B) Ammonia.
(C) Uric acid.
(D) Ammonium chloride.
48. Which one of the following is NOT a part of the urinary system?
(A) Urinary bladder.
(B) Ureter.
(C) Bronchi.
(D) Urethra.
49. Protein synthesis of a cell occurs in the :
(A) Nucleus of a cell.
(B) Cytoplasm of a cell.
(C) Mitochondria.
(D) Both (a) and (b).
50. How many pairs of autosomes are there in a normal human being?
(A) 10.
(B) 21.
(C) 23.
(D) 22.
51. Part of the female reproductive system in human where fertilization takes place:
(A) Uterus.
(B) Fallopian tube.
(C) Ovary.
(D) Vagina.
52. What is the name of the gland that controls blood pressure in the human body?
(A) Thalamus Gland.
(B) Adrenal Gland.
(C) Parathyroid Gland.
(D) Pancreas Gland.
53. Which is the longest organ of the digestive system in the human body? :
(A) Pancreatic duct.
(B) Small intestine.
(C) Large intestine.
(D) Esophagus.
54. Which of the following is also known as antidiuretic hormone?
(A) Oxytocin.
(B) Adrenaline.
(C) Calcitonin.
(D) Vasopressin.
55. Which of the following statement is false?
(A) Pituitary Gland is found at the base of the brain.
(B) Adrenal glands are found on top of the kidneys.
(C) Lymph nodes are found only near the neck and armpits.
(D) Thyroid glands are ductless glands.

56. Parietal cells of human stomach secrete :
- (A) Hydrochloric acid.
 - (B) Oxytocin.
 - (C) Adrenaline.
 - (D) Testosterone.
57. Where are the parotid glands located?
- (A) Below the stomach.
 - (B) Behind and above the pancreas.
 - (C) Below and in front of the ear canal.
 - (D) Underneath the armpits.
58. Which of the following structures keep blood flowing unidirectional in humans?
- (A) Bronchiole.
 - (B) Neuron.
 - (C) Septum.
 - (D) Valves.
59. Which of the following is the structural and functional unit of the human nervous system?
- (A) Brain.
 - (B) Axon.
 - (C) Dendron.
 - (D) Neuron.
60. Which of the following cells in the pancreas make insulin?
- (A) Epithelial cells.
 - (B) Hepatic cells.
 - (C) Germ cells.
 - (D) Islet cells.
61. Which of the following instrument is used to listen to the internal sounds of the human body?
- (A) Sphygmomanometer.
 - (B) Suction device.
 - (C) Stethoscope.
 - (D) Reflex hammer.
62. Which of the following is known as the study of the human population?
- (A) Geography.
 - (B) Anthropology.
 - (C) Ornithology.
 - (D) Demography.
63. Patients with which of the following diseases are treated with injections of vitamin B12?
- (A) Crohn's disease.
 - (B) Diabetes mellitus.
 - (C) Graves' disease.
 - (D) Pernicious anemia.
64. Which of the following structure is a part of the small intestine?
- (A) Ascending colon.
 - (B) Ileum.
 - (C) Sigmoid colon.
 - (D) Transverse colon.

65. Testosterone is produced mainly from?
(A) Glans penis.
(B) Prostate.
(C) Testes.
(D) Vas deferens.
66. The process of copying genetic information from one strand of the DNA into RNA is termed :
(A) Translation.
(B) Transcription.
(C) Termination.
(D) None of the above.
67. Acquired Immuno Deficiency Syndrome (AIDS) is caused by :
(A) DNA virus.
(B) RNA virus.
(C) Retrovirus.
(D) Both (b) and (c).
68. Factors that may affect the enzyme activity is :
(A) Temperature.
(B) pH.
(C) Concentration.
(D) All of these.
69. The sugar present in RNA is :
(A) Ribose.
(B) Deoxyribose.
(C) Fructose.
(D) Pentose.
70. In DNA structure normally Adenine makes the hydrogen bond only with :
(A) Thymine.
(B) Guanine.
(C) Cytosine.
(D) Uracil.
71. Hemoglobin A (HbA) is the most common adult form of hemoglobin, which consists of :
(A) 2 alpha and 2 gamma subunits.
(B) 4 gamma subunits.
(C) 2 alpha and 2 beta subunits.
(D) 2 alpha and 2 delta subunits.
72. Which of the following statement is not correct with respect to Deoxyribonucleic Acid (DNA)?
(A) It is found in prokaryotic and eukaryotic cells and in many viruses.
(B) The DNA molecule consists of a single strand that is made of deoxyribose and phosphate groups.
(C) DNA codes genetic information for the transmission of inherited traits.
(D) Each strand has a backbone made of alternating sugar (deoxyribose) and phosphate groups.

73. Krebs Cycle :
- (A) Occurs inside the mitochondria.
 - (B) Produces energy in the form of ATP.
 - (C) The first product of Krebs cycle is Citric acid so it is also called Citric acid cycle.
 - (D) All of the above are true.
74. PCR (Polymerase Chain Reaction): which is notcorrect?
- (A) There is only one step in the process called “Denaturation”.
 - (B) Requires Taq DNA polymerase.
 - (C) Two primers are required for a single length of DNA sequence to be copied.
 - (D) Primers are short sequence of nucleotides.
75. DNA is present in the :
- (A) Mitochondria of a cell.
 - (B) Nucleus of a cell.
 - (C) Only in (A)
 - (D) (A) and (B) both.
76. Migration of cancerous cells from the site of origin to other part of the body forming secondary tumors is called :
- (A) Proliferation.
 - (B) Diapedesis.
 - (C) Apoptosis.
 - (D) Metastasis.
77. Regarding amino acids which of the statement is notcorrect?
- (A) Are small molecules containing carbon, hydrogen, oxygen, nitrogen and in some cases alsosulphur.
 - (B) Essential amino acids are those that are essential for human body.
 - (C) Lysine and Arginine are basic amino acids.
 - (D) Proteins are made up of amino acids.
78. The internal lining in the trachea is made up of:
- (A) Simple cuboidal epithelium.
 - (B) Pseudostratified ciliated columnar epithelium.
 - (C) Simple squamous epithelium.
 - (D) Transitional epithelium.
79. The life span of red blood cells is?
- (A) 30 days.
 - (B) 100 days.
 - (C) 120 days.
 - (D) 180 days.
80. Which of the following organelle in a cell is called “Suicidal Bag”?
- (A) Mitochondria.
 - (B) Endoplasmic Reticulum.
 - (C) Lysosome.
 - (D) Ribosome.

81. All of the following are proapoptotic proteins except:
(A) Bax.
(B) Bid.
(C) Bcl-2.
(D) Bak.
82. All of the following are anti apoptotic proteins except:
(A) Bcl-x1.
(B) Bcl-2.
(C) BCL-6.
(D) None of the above.
83. The most abundant protein found in the red cell membrane is :
(A) Glycoprotein.
(B) Lipoprotein.
(C) Mucoprotein.
(D) Nucleoprotein.
84. Shape of any cell is maintained by:
(A) Microtubules.
(B) Spindle fibres.
(C) Endoplasmic reticulum.
(D) Membrane proteins.
85. No change in genetic material occurs in which of the following cytogenetic abnormalities?
(A) Deletions.
(B) Insertion.
(C) Translocation.
(D) Inversion.
86. Preferential expression of the gene depending upon the parent of origin is called:
(A) Genomic imprinting.
(B) Anticipation.
(C) Mosaicism.
(D) Pleotropism.
87. Genomic imprinting includes:
(A) DNA methylation.
(B) Histone deacetylation.
(C) Histone methylation.
(D) All of the above.
88. Isochromosomes are:
(A) Duplication of one arm,when the other arm is lost.
(B) Rearrangement within chromosome involving two breaks.
(C) Loss of a portion of arm of chromosomes.
(D) Transfer of a segment of one chromosome to another.
89. Ubiquitinated proteins are destroyed by:
(A) Proteosome.
(B) Endosome.
(C) Aggresome.
(D) Microsome.

90. Intron splicing occurs in:
(A) Nucleus.
(B) Cytoplasm.
(C) Golgi body.
(D) Both 1 & 2.
91. Which coagulation factor has the shortest half-life?
(A) Factor-7.
(B) Factor-8.
(C) Factor-5.
(D) Factor-13.
92. What is the chance of a daughter of a severe Haemophilia A to be a carrier state?
(A) 75.
(B) 25.
(C) 50.
(D) 100.
93. Specific/secondary granules appear at which stage of granulocyte development?
(A) Myeloblast.
(B) Metamyelocyte.
(C) Myelocyte.
(D) Promyelocyte.
94. Which of the following is not found in primary granules?
(A) Myeloperoxidase (MPO).
(B) Elastase.
(C) Proteinase-3.
(D) Lactoferrin.
95. Which of the following is found in all the types of granules in granulocytic stages:primary,secondary,tertiary?
(A) Defensin.
(B) Myeloperoxidase.
(C) Lysozyme.
(D) Lactoferrin.
96. True statement about Myeloperoxidase is :
(A) Located in primary and secondary granules of neutrophils.
(B) A lipophilic dye.
(C) Not inhibited by heparin.
(D) Not seen in eosinophilic granule.
97. Primary(azurophilic) granules start appearing at which stage of granulocyte development?
(A) Promyelocyte.
(B) Myeloblast.
(C) Metamyelocyte.
(D) Myelocyte.
98. Neutrophil alkaline phosphatase activity is found in:
(A) Neutrophil.
(B) Eosinophil.
(C) Myeloblast.
(D) Monocyte.

99. Thalassemia control has been most successful in:
- (A) USA.
 - (B) CYPRUS.
 - (C) IRAQ.
 - (D) THAILAND.
100. Major cause of death in thalassemia major is due to :
- (A) Endocrinopathies.
 - (B) Cardiomyopathies.
 - (C) Liver failure.
 - (D) Infection.