

1. Central nervous system is originated from
  - A) Ectoderm
  - B) Endoderm
  - C) Mesoderm
  - D) None of these
  
2. Bilateral cleavage pattern is found in
  - i. Vertebrates
  - ii. Tunicates
  - iii. Amphioxus
  - iv. Echinoderms
  - A) i & ii
  - B) ii & iii
  - C) i & iv
  - D) ii & iv
  
3. In Sea urchin, acrosomal reaction is artificially induced by
  - A) Increasing the concentration of Na in seawater
  - B) Decreasing the concentration of Na in seawater
  - C) Increasing the concentration of Ca in seawater
  - D) Decreasing the concentration of Ca in seawater
  
4. Herpes Virus (HHV-8) is associated with
  - A) Liver cancer
  - B) Burkitt's lymphoma
  - C) Kaposi sarcoma
  - D) None of these
  
5. Best anticancer strategy for the early detection of prostate cancer
  - A) Mammography
  - B) Pap smear
  - C) PSA determination
  - D) Colonoscopy
  
6. The diffusion ratio of membrane proteins is measured by using
  - A) FRAP
  - B) CRAP
  - C) RAP
  - D) SNAP
  
7. Cystic fibrosis is an inherited disease caused by the defect in which of the following ion channel
  - A) Na<sup>+</sup> channel
  - B) Cl<sup>-</sup> channel
  - C) K<sup>+</sup> channel
  - D) Ca<sup>2+</sup> channel
  
8. Disease associated with G protein coupled receptors
  - A) Hyperthyroidism
  - B) X linked nephrogenic diabetes incipidus
  - C) Retinitis pigmentosa
  - D) All the above
  
9. Nauplius is the larval form of
  - A) Mollusca
  - B) Echinidermata
  - C) Crustacean
  - D) Annelids

10. The region of DNA with inverted repeats of base sequence having two fold symmetry over two strands of DNA  
 A) Hoogsteen pairing                      B) Palindrome sequence  
 C) Non-palindrome sequence              D) None of these
11. Left handed DNA  
 A) H DNA                                      B) B DNA  
 C) A DNA                                      D) Z DNA
12. Organizer theory was proposed by  
 A) Child                                        B) William Raux  
 C) Spemann                                    D) Wolf
13. Organisms that directly or indirectly control the availability of resources to other species by causing changes in the physical state of their environment  
 A) Keystone species                        B) Engineer organisms  
 C) Parasitic organisms                      D) Critical link species
14. Shallow pool of water exposed to sunlight is  
 A) Solar pond                                 B) Normal pond  
 C) Extreme pond                              D) Cyclic pond
15. Which of the following is the correct sequence of stages in evolution of modern horse?  
 A) Eohippus, Merychippus, Mesohippus, Phiohippus, Equus  
 B) Eohippus, Merychippus, Phiohippus Mesohippus, , Equus  
 C) Eohippus, Mesohippus, Merychippus, Phiohippus, Equus  
 D) Eohippus, Phiohippus Mesohippus, Merychippus, , Equus
16. Which of the following is an example of polymorphism in human population  
 i. Sickle cell gene in human    ii. Albinism in human  
 iii. ABO Blood group in human    iv. Melanism in human  
 A) i & ii                                        B) ii & iv  
 C) i & iii                                        D) iii & iv
17. Darwin finches in Galapagos island is an example of  
 A) Ecological equivalence                B) Ecological Guild  
 C) Ecological dominance                D) None of the above
18. “The birds in colder regions will have narrow wings while those in warmer areas will have broader wings” is stated by  
 A) Allan’s rule                                B) Rench rule  
 C) Bermen’s rule                              D) Gloger’s rule

19. The timing of seasonal activities of plants in relation to change in environmental conditions is called  
A) Phenology    B) Palynology  
C) Penology     D) Pleonology
20. The non reducing sugar, a major constituent of the circulating fluid of insects, serving as an energy storage compound  
A) Sucrose     B) Trehalose  
C) Both A and B                                         D) None of these
21. Gamow was initiator of "RNA Tie Club", having 20 members and each representing an amino acid. Crick was a member and was known by  
A) Alanine             B) Valine             C) Tyrosine             D) Proline
22. The half life period of a radioactive isotope is 4.5 days. The fraction left behind after 13.5 days is  
A)  $\frac{1}{2}$      B)  $\frac{1}{4}$      C)  $\frac{1}{6}$      D)  $\frac{1}{8}$
23. Among the human cranial nerves, which among the following are purely sensory?  
A) I, II, VIII     B) I, III, V  
C) I, VII, XI     D) I, IV, VIII
24. Which of the following is characterised by possession of CD8 surface marker?  
A) Helper T Lymphocytes                                 B) Regulatory T lymphocytes  
C) Cytotoxic T lymphocytes                                 D) Both A & C
25. The first antibodies secreted by B-Cells following stimulation by antigen is  
A) Ig D     B) Ig M  
C) Ig E     D) Ig A
26. Cardiovascular control center in the nervous system  
A) Hypothalamus     B) Medulla oblongata  
C) Cerebrum     D) Cerebellum
27. In nocturnal animals, pigmented layer in choroid is replaced by reflecting layer called  
A) Pigmentosa     B) Pecton  
C) Toroid     D) Tapetum
28. Which among the following is an oral anticoagulant?  
A) Heparin     B) Warfarin  
C) EDTA     D) Dicumarol
29. Ornithine cycle is associated with Krebs cycle through  
A) Fumaric acid     B) Malic acid  
C) Succinic acid     D) Oxalo succinic acid

30. 4D Syndrome is associated with the deficiency of  
 A) Riboflavin    B) Biotin    C) Tocopherol    D) Niacin
31. World Animal Day is on  
 A) October 3    B) August 29  
 C) September 16    D) December 2
32. Example of an allosteric inhibitor  
 A) Malonite    B) Cyanide  
 C) Glucose-6-phosphate    D) None of these
33. Holandric genes are present in  
 A) Autosomes    B) X Chromosomes  
 C) Y Chromosomes    D) X and Y Chromosomes
34. Heterosis is  
 A) Hybrid vigour    B) Hybrid sterility  
 C) Hybrid incompatibility    D) Structural hybridity
35. 'Black Water Disease' is caused by which species of plasmodium?  
 A) *P. vivax*    B) *P. ovale*  
 C) *P. falciparum*    D) *P. malariae*
36. The phenotypic ratio in supplementary gene interaction is  
 A) 9:7    B) 9:3:4    C) 9:6:1    D) 13:3
37. Down's syndrome is an example of  
 A) Aneuploidy    B) Polyteny  
 C) Polyploidy    D) Monoploidy
38. If a marriage is made between a universal donor mother and a universal recipient father, what will be the possible % of blood group of children?  
 A) 100% O    B) 75% AB and 25% O  
 C) 50 % A and 50% B    D) 100% AB
39. Cross sectional image of internal body structure can be obtained by using this medical technique  
 A) EEG    B) PET    C) CAT    D) NMR
40. Crypt of Liberkuhn is an example for  
 A) Simple tubular gland    B) Compound tubular gland  
 C) Coiled tubular gland    D) Simple alveolar gland
41. Liver and pancreas are derived from  
 A) Embryonic foregut    B) Embryonic midgut  
 C) Embryonic hindgut    D) Embryonic mesoderm

42. Gaucher's disease is associated with  
 A) Abnormal protein metabolism  
 B) Abnormal carbohydrate metabolism  
 C) Abnormal fat metabolism  
 D) Vitamin deficiency
43. Eunuchoidism is due to the lack of  
 A) Secretin  
 B) GH  
 C) Pancreozymine  
 D) Sex corticoid hormone
44. Food can be preserved at freezing temperature whereby  
 A) Making the enzymes of microbes inactive  
 B) Making the enzymes inactive  
 C) Causing modulation to enzymes  
 D) Both A and B
45. Sulpha drugs generally act as  
 A) Competitive inhibitors  
 B) Non competitive inhibitors  
 C) Allosteric inhibitors  
 D) Modulators
46. In heavy smokers, the alveoli of the lungs are enlarged and damaged, which reduces the surface area for the exchange of respiratory gases. This condition is called  
 A) Asthma  
 B) Emphysema  
 C) Anosmia  
 D) Bronchitis
47. In which of these would you find white fibrous tissue in abundance?  
 A) Cartilage  
 B) Ligament  
 C) Bone  
 D) Tendon
48. Radioisotope used in PET scanning?  
 A)  $P^{32}$   
 B)  $C^{11}$   
 C)  $Ca^{45}$   
 D)  $I^{131}$
49. The foetus developing in the uterus of the mother is considered as  
 A) Heterograft  
 B) Allograft  
 C) Autograft  
 D) Xenograft
50. When a lost limb of a Newt is regenerated, it is  
 A) Epimorphosis  
 B) Morphollaxis  
 C) Allometric growth  
 D) None of these
51. Cerebrospinal fluid flows from lateral ventricle into the third ventricle through  
 A) Foramen magnum  
 B) Foramen monro  
 C) Foramen panizza  
 D) Foramen ovale

52. If loop of Henle were absent from an individual's nephron, which one of the following is to be expected?  
 A) The urine will be more dilute  
 B) The urine will be more concentrated  
 C) There will be no urine formation  
 D) There will hardly be any change in the quality and quantity of urine formed
53. Hassall's corpuscles are found in  
 A) Pineal gland  
 B) Kidney  
 C) Liver  
 D) Thymus gland
54. Chordates first came in which of the following period/era?  
 A) Precambrian  
 B) Ordovician  
 C) Silurian  
 D) None of these
55. According to the World Health Organisation (WHO), the diseases which are designated as "Neglected Tropical Diseases" (NTP)  
 i. Rabies  
 ii. Malaria  
 iii. Snake bite  
 iv. Tuberculosis  
 A) i & ii  
 B) ii & iv  
 C) i & iii  
 D) iii & iv
56. Endoscopy, a technique used to explore the stomach or other inner parts of the body is based on the phenomenon of  
 A) Total internal reflection  
 B) Interference  
 C) Diffraction  
 D) Polarization
57. The sequencing of the entire genome (the totality of all genes) of an organism was completed in 1996. The organism was:  
 A) Yeast  
 B) Albino mouse  
 C) Human being  
 D) Plasmodium vivax
58. Hoverflies, of the family Syrphidae, which are striped black and yellow to resemble stinging bees and wasp is an example of  
 A) Aposematic coloration  
 B) Polymorphism  
 C) Batesian mimicry  
 D) Camouflage
59. A short length of double stranded DNA molecule contains 120 adenine and 120 cytosine bases. The total number of nucleotides in this DNA fragments is  
 A) 120  
 B) 480  
 C) 240  
 D) 60
60. pH of  $10^{-8}$  M HCl  
 A) 7.1  
 B) 8.1  
 C) 5.9  
 D) 6.9

61. In a closed vessel of 2L capacity at equilibrium, 40% of  $\text{PCl}_5$  dissociated into  $\text{PCl}_3$  and  $\text{Cl}_2$ , what is the value of equilibrium constant? ( 2mols of  $\text{PCl}_5$  was heated)
- A) 0.267                      B) 0.8                      C) 1.2                      D) 0.96
62. SWISS-PORT is related to
- A) Portable data                      B) Swiss Bank data  
C) Sequence data bank                      D) Swiss sequence data
63. Secondary binding is an association between
- A) Inner acrosomal membrane and ZP2  
B) Inner acrosomal membrane and ZP3  
C) Galactosyl transferase1 and ZP3  
D) Outer sperm plasma membrane and ZP2
64. Mass spectrometry does not differentiate between
- A) Tautomers                      B) Functional isomers  
C) Constitutional isomers                      D) Optical isomers
65. Which of the following is not involved in siRNA gene silencing pathway?
- A) Binding of a stable protein heterodimer to the double stranded RNA  
B) Involves the assembly of guide strand to siRISC and not passenger strand  
C) Export of processed siRNA to the cytoplasm by Exportin-5 for maturation by DCR1  
D) RNA hydrolysis by Argonaute protein in siRISC
66. The subunits at the active center of RNA Polymerase holoenzymes in *E.coli* is made up of
- A)  $\alpha_2$  subunits                      B)  $\beta$  and  $\beta'$  subunits  
C)  $\beta$  and  $\sigma$  subunits                      D)  $\alpha$ -CTD subunits
67. Sneak synthesis is
- A) Basal level enzyme production  
B) Protein production during amino acid starvation  
C) Glucogenesis  
D) None of these
68. Which among the following is a pheromone gland present in Honey bee?
- A) Nasonov's gland                      B) Dufour's gland  
C) Pavan's gland                      D) Poison gland
69. Genes of different species but possessing a clear sequence and functional relationship to each other are called
- A) Paralogs                      B) Comparative genes  
C) Synteny                      D) Orthologs

70. Name the compound released from plant cells, which is detected by *Agrobacterium tumifaciens* that enables *vir* gene expression on Ti plasmid  
 A) Indolacetate                                      B) Nopaline  
 C) Zeatin    D) Acetosyringone
71. Which of the following is the function of polynucleotide kinase, the enzyme used in DNA recombinant technology?  
 A) Add a phosphate to the 3'-OH end of the polynucleotide to label it or permit ligation  
 B) Add phosphate tails to the 3'-OH ends of a linear duplex  
 C) Add phosphate tails to the 5'-OH ends of a linear duplex  
 D) None of the above
72. Number of overturn of duplex axis of a double stranded DNA around the supercoiling axis is called  
 A) Twist    B) Writh  
 C) Linking number                                      D) Superhelical density
73. The PCR used to generate single stranded copies of a DNA sequencing or can be used as probes or even as primers  
 A) Asymmetric PCR                                      B) Inverse PCR  
 C) RT PCR    D) Real Time PCR
74. Eukaryotic DNA polymerase  $\gamma$  is involved in  
 A) DNA repair  
 B) Primer synthesis in the leading strand  
 C) Mitochondrial DNA replication  
 D) Elongation of leading strand
75. Which of the following is the cleavage point of chymotrypsin of bovine pancreas?  
 A) Phe, Trp, Tyr (C)                                      B) Phe, Trp, Tyr (N)  
 C) Asp, Glu (C)    D) Asp, Glu (N)
76. The autoimmune disease mediated by stimulating or blocking auto-antibodies  
 A) Grave's disease                                      B) Insulin dependant diabetes mellitus  
 C) Good Pasture's syndrome                              D) Hashimoto's Thyroiditis
77. Glucose transporter expressed in muscles  
 A) GLUT 2              B) GLUT 4              C) GLUT 5              D) GLUT 6
78. The potent and specific inhibitor of  $\text{Na}^+ \text{K}^+$  ATPase  
 A) Ouabain    B) Thapsigargin  
 C) Vanadate    D) Vinblastine
79. ABC transporters are  
 A) ATP dependant transporters  
 B) Responsible for antitumor drug resistance  
 C) Present in plasma membrane  
 D) All of the above



80. Converting toxin to toxoid  
 A) Makes the toxin more immunogenic  
 B) Enhances binding with antitoxin  
 C) Reduces the pharmacologic activity of the toxin  
 D) Induces only immunity
81. Normal human blood has the lowest percentage of  
 A) Monocyte  
 B) Eosinophil  
 C) Basophil  
 D) Neutrophil
82.  $\alpha$ -amanitin inhibits  
 A) Only RNA polymerase I  
 B) Only RNA polymerase II  
 C) Only RNA polymerase III  
 D) All RNA polymerase
83. The proteins which play substantial role in linking together sister chromatids immediately after replication and keeping them together as the chromosome contents to metaphase  
 A) SMC proteins  
 B) Cohesin  
 C) Histones  
 D) Condensins
84. Rieske – center, the iron-sulfur protein center, is found in which of the following electro carrying complex of respiratory chain?  
 A) Complex I  
 B) Complex II  
 C) Complex III  
 D) Complex IV
85. Effective population size ( $N_E$ ), density of population is given by N in ecology  
 A)  $N_E = \frac{N_m N_f \times 4}{N_m + N_f}$   
 B)  $N_E = \frac{N_m N_f \times 2}{N_m + N_f}$   
 C)  $N_E = \frac{N_m N_f}{N_m + N_f \times 4}$   
 D)  $N_E = \frac{N_m N_f}{N_m + N_f \times 2}$
86. Ultraviolet light exposure in DNA causes  
 A) Pyrimidine dimer  
 B) Single strand break  
 C) Base deletions  
 D) Purine dimer
87. The chemical transmitter between sympathetic post ganglionic fibers and effector organ is  
 A) Acetyl choline  
 B) Adrenaline  
 C) Epinephrine  
 D) Nor-epinephrine

88. Proteins that connect gap junction are  
 A) Connexins B) Aquaporin C) Selectin D) Separin
89. Acrosome of spermatids is formed by  
 A) Nucleolus B) Centriole  
 C) Mitochondria D) Golgi body
90. What are MCM proteins?  
 A) Kinase B) Helicase  
 C) Inhibitor molecules D) Nucleases
91. Bony fishes are  
 A) Ammonitelic B) Ureotelic  
 C) Urecotelic D) Both A & C
92. Which of the following activates the enzymes HMG CoA reductase and favours cholesterol synthesis?  
 A) Glucagon B) Cholesterol  
 C) ACAT D) Insulin
93. Lesch-Nyhan syndrome is due to genetic lack of activity of  
 A) Adenosinephosphoribosyl transferase  
 B) Adenosine deaminase  
 C) Hypoxanthine guanine phosphoribosyl transferase  
 D) Thymidylate synthase
94. Which of the following is called an uncoupling protein?  
 A) Thermogenin B) Leptin C) Ghrelin D) Insulin
95. Which one of the following is not a synthetic organic insecticide?  
 A) Dieldrin B) Toxaphene C) BHC D) Quassia
96. Which of the following set includes bacterial disease?  
 A) Malaria, mumps, poliomyelitis  
 B) Diphtheria, leprosy, plague  
 C) Cholera, typhoid, mumps  
 D) Tetanus, tuberculosis, measles
97. Life cycle of plasmodium in human blood is called  
 A) Syngamy B) Sporogony  
 C) Erythrocytic schizogony D) None of these
98. Stuart Power factor of blood clotting is  
 A) Factor III B) Factor IX  
 C) Factor X D) Factor XIII

99. Name the test used to estimate the difference in observed result in frequencies and expected result of an experiment  
A) Z Test B) F Test  
C) T Test D) Chi Square Test
100. The first step of  $\beta$  oxidation involves the activation of fatty acid in the presence of  
A)  $Ca^{++}$  and thiokinase enzyme  
B) ATP and thiokinase enzyme  
C) ATP and  $\beta$  ketoacyl thiolase  
D) ATP and aldehyde dehydrogenase
101. Name the Class II promoter that is positioned about 25 base pair upstream of transcription start site in higher eucaryotes  
A) GC box B) BREs  
C) TATA box D) CAAT box
102. The composition of 50s subunit of prokaryotic ribosome  
A) 5S rRNA, 23S rRNA, 34 protein  
B) 5S rRNA, 28S rRNA, 49 protein  
C) 5.8S rRNA, 28S rRNA, 49 protein  
D) 18S rRNA, 16S rRNA, 5S r RNA
103. Which of the following is called ribozyme?  
A) 16S r RNA B) 28S r RNA  
C) 23S r RNA D) 18S r RNA
104. The antibiotic that inhibits peptidyl transferase of 50S ribosomal subunits and thus blocks chain elongation in prokaryotic cell  
A) Tetracycline B) Streptomycin  
C) Erythromycin D) Chloramphenicol
105. Ubiquitin attaches to target proteins via covalent bond between C-terminal glycine of Ubiquitin and  $\epsilon$  side chain amino group of which residues of target protein?  
A) Lys B) Gly C) Leu D) Val
106. What are Bence-Jones proteins?  
A) Light chains of immunoglobins  
B) Heavy chains of immunoglobins  
C) A hydrophobic transmembrane sequence  
D) Extracellular hydrophilic spacer proteins
107. *Cosmopolites sordidus* is the pest of  
A) Sugar cane B) Jowar C) Banana D) Cotton
108. Hunger hormone secreted by stomach  
A) Pituitary hormone B) Ghrelin  
C) Flexin D) Melanin

109. Type of dentition in grazing mammals  
 A) Lophodont                                  B) Secodont  
 C) Bunodont                                  D) Selenodont
110. ABO blood group is determined by allele located on  
 A) Chromosome No 12                          B) Chromosome No 6  
 C) Chromosome No 9                          D) Chromosome No 3
111. In smooth muscles,  $\text{Ca}^{2+}$  combines with a protein in the cytoplasm called calmodulin. Each calmodulin can bind with  
 A)  $1 \text{ Ca}^{2+}$                           B)  $2 \text{ Ca}^{2+}$                           C)  $3 \text{ Ca}^{2+}$                           D)  $4 \text{ Ca}^{2+}$
112. Accumulated lactic acid from muscles is carried to the liver via blood and converted to glucose by a process  
 A) Kerb cycle                                  B) Cori cycle  
 C) Glycosylate cycle                          D) None of these
113. The anticoagulant found in uterine wall which prevent clotting of menstrual blood inside the uterus  
 A) Warfarin                                  B) Heparin  
 C) Citrate salt                                  D) Plasmin
114. Which reptilian species was included in the latest “Red List” of threatened species?  
 A) Cecaelian                                  B) *Rana cartipus*  
 C) *Ophiophagus Hannah*                          D) *Echis carinatus*
115. Number of linkage group in an organism is always equal to  
 A) Number of X chromosome                          B) Number of Y chromosome  
 C) Number of barr bodies                          D) Haploid number of chromosomes
116. Discoblastula is the chareteristic of  
 A) Fishes                                  B) Reptiles  
 C) Birds                                  D) All of these
117. SA Node of pacemaker is kept on the  
 A) Right auricle                                  B) Left auricle  
 C) Right ventricle                                  D) Left ventricle
118. Cowper’s gland is associated with  
 A) Circulatory system                          B) Reproductive system  
 C) Nervous system                                  D) Muscular system
119. Hemoglobin is formed of  
 A)  $2 \alpha$  and  $2 \beta$  subunits                          B)  $3 \alpha$  and  $1 \beta$  subunits  
 C)  $1 \alpha$  and  $3 \beta$  subunits                          D) Only  $\alpha$  subunits
120. Duct of Rivinus is in  
 A) Parotid gland                                  B) Sub-maxilliary gland  
 C) Sub-lingual gland                                  D) None of these