

## BOTANY

(Original Solved Question Paper)

12903

120 MINUTES

1. The plant part from which colchicine is isolated  
A) Fruit & seeds  
B) Stem & leaf  
C) Seeds & corms  
D) Fruit & bulb  
**Ans. C**
2. Albuminous cells are present in  
A) Monocotyledonous plants  
B) Hydrophytes  
C) Gymnosperms  
D) Bryophytes  
**Ans. C**
3. The Casparian strip is usually composed of  
A) Pectin  
B) Lignin  
C) Suberin  
D) Chitin  
**Ans. C**
4. Histochemical localization of proteins is performed by using  
A) Sudan black  
B) Mercuric bromophenol blue  
C) Periodic acid Schiff's (PAS) reagent  
D) Iodine potassium iodide (IKI) solution  
**Ans. B**
5. Orcein is obtained from  
A) Fractionation of coal tar  
B) Heartwood of *Caesalpinia*  
C) *Rocella tinctoria*.  
D) Abdominal part of insects *Dactylopius coccus*  
**Ans. C**
6. Janus green B is used to stain  
A) Chloroplast  
B) Golgi complex  
C) Vacuoles  
D) Mitochondria  
**Ans. D**
7. The sectioning of woody materials for histo enzymological study is made through----  
A) Rotary microtome  
B) Sledge microtome  
C) Cryotome  
D) Rocking microtome  
**Ans. B**
8. Molecular formula of chlorophyll a is  
A)  $C_{55}H_{70}O_5N_4Mg$   
B)  $C_{55}H_{72}O_6N_4Mg$   
C)  $C_{55}H_{70}O_6N_4Mg$   
D)  $C_{55}H_{72}O_5N_4Mg$   
**Ans. D**
9. RQ value of protein is  
A) Higher than 1  
B) 1  
C) Less than 1  
D) Infinite  
**Ans. C**
10. Recombination nodules are present in  
A) Kinetochore  
B) Centriole  
C) Synaptonemal complex  
D) Nucleolar organizing region  
**Ans. C**

11. The movement of solutes in the phloem is mainly  
A) Lateral B) Acropetal  
C) Basipetal D) Centripetal **Ans. D**
12. The first stable compound in Hatch and Slack cycle is  
A) Pyruvic acid B) Malic acid  
C) Citric acid D) Oxalo acetic acid **Ans. D**
13. ----- is an example for sulphur containing amino acid  
A) Aspartic acid B) Methionine  
C) Glycine D) Isoleucine **Ans. B**
14. Microevolution means  
A) Evolution at geographical level  
B) Evolution in a small community  
C) Changes in gene frequency within a population  
D) Spatial evolution **Ans. C**
15. When a population formerly continuous in range, splits into two or more geographically isolated populations and form new species, the mode of speciation is  
A) Sympatric speciation B) Polytypic speciation  
C) Allopatric speciation D) Evolutionary speciation **Ans. C**
16. Endosperm is absent in  
A) Orchidaceae B) Compositae  
C) Poaceae D) Malvaceae **Ans. A**
17. Tyloses are  
A) Composite sieve plate B) Specialized laticiferous canals  
C) Tracheal plugs D) Resin ducts **Ans. C**
18. In *Dracaena*, secondary vascular bundle is  
A) Bicollateral B) Amphicribal  
C) Collateral D) Amphivasal **Ans. D**
19. Osmium tetra oxide is used in electron microscopy as a  
A) Fixing agent B) Mordant  
C) Staining agent D) Precipitator **Ans. C**
20. The pH of phloem sap is about-----  
A) 5.5-6.5 B) 6.5 -7.5  
C) 8.0-8.5 D) 4.5-5.5 **Ans. C**

21. Q<sub>10</sub> refers to  
A) Quantum recharge  
B) Respiratory coefficient  
C) A temperature coefficient  
D) Photosynthetic active radiation (PAR) coefficient  
**Ans. C**
22. Warburg effect explains decreased rate of photosynthesis due to  
A) High concentration of CO<sub>2</sub>    B) Low concentration of CO<sub>2</sub>  
C) High concentration of O<sub>2</sub>    D) Low concentration of O<sub>2</sub>  
**Ans. C**
23. Fruit drop is caused by  
A) Accumulation of more auxin in fruit than in stem  
B) Accumulation of less auxin in fruit than in stem  
C) Absence of auxin in stem and roots  
D) Accumulation of auxin in roots  
**Ans. B**
24. The closure of lid of pitcher in *Nepenthes* is  
A) A turgor movement    B) A paratonic movement  
C) A tropic movement    D) An autonomic movement  
**Ans. B**
25. National park is an example of  
A) *In vitro* conservation    B) *Ex situ* conservation  
C) *In situ* conservation    D) All of these  
**Ans. C**
26. In *Funaria* capsule, the peristome consist of  
A) 16 teeth    B) 32 teeth  
C) 64 teeth    D) 128 teeth  
**Ans. B**
27. Protonema is found in  
A) *Riccia*    B) *Anthoceros*  
C) *Marchantia*    D) *Funaria*  
**Ans. D**
28. Western Ghats passes through ----- states in India  
A) 6    B) 4  
C) 7    D) 5  
**Ans. A**
29. Partial or complete loss of virulence in pathogen is called  
A) Abortive parasitism    B) Attenuation  
C) Neutralism    D) Susceptibility  
**Ans. B**
30. Phytoalexins are produced  
A) During infection    B) During flowering  
C) Throughout the lifecycle    D) By seedlings only  
**Ans. A**

31. Katte disease of cardamom is caused due to  
A) *Colletotrichum elettariae* B) *Phytophthora medii*  
C) *Cardamom mosaic virus* D) *Fusarium* sp. **Ans. C**
32. If the probability of being blood type A is  $\frac{1}{8}$  and the probability of blood type O is  $\frac{1}{2}$ , what is the probability of being either blood type A or blood type O?  
A)  $\frac{5}{8}$  B)  $\frac{1}{16}$   
C)  $\frac{1}{8}$  D)  $\frac{1}{2}$  **Ans. A**
33. An animal has a diploid number of 8 chromosomes. During meiosis how many chromatids are present in metaphase of second meiotic stage?  
A) 16 B) 8  
C) 4 D) 32 **Ans. A**
34. What is the sexual phenotype of a diploid fruit fly that has XXYYY sex chromosome?  
A) Male B) Female  
C) Intersex D) Metamale **Ans. B**
35. Betty has normal vision but her mother is color blind. Sam is color blind. If Betty and Sam are married and have a girl child, what is the probability that the child will be color blind?  
A)  $\frac{1}{4}$  B)  $\frac{1}{2}$  C)  $\frac{1}{3}$  D)  $\frac{2}{3}$  **Ans. B**
36. How many genotypes are present at a locus with four alleles?  
A) 15 B) 10 C) 8 D) 16 **Ans. B**
37. An organism has 10 pairs of independent genes. Aa BB cc Dd Ee Ff Gg HH II Jj. How many types of gametes with respect to gene content can this individual produce?  
A) 16 B) 32 C) 64 D) 128 **Ans. C**
38. Which process of DNA transfer in bacteria require a virus  
A) Conjugation B) Transduction  
C) Transformation D) All of these **Ans. B**
39. Species A has  $2n=16$  chromosomes and species B has  $2n=14$  chromosomes. How many chromosomes would be found in an allotriploid of these two species?  
A) 21 or 24 B) 42 or 48  
C) 22 or 23 D) 45 **Ans. C**
40. The percentage of cytosine in double stranded DNA molecule is 40%. What is the percentage of Thiamine?  
A) 40% B) 60%  
C) 20% D) 10% **Ans. D**

41. What type of replication require a break in the nucleotide strand to get started  
A) Theta replication                      B) Rolling cycle replication  
C) Linear eukaryotic replication      D) All of these *Ans. B*
42. If two loci are 10 map units apart, what proportion of the meiotic events will contain a single cross over in the region between these two loci, assuming that no multiple cross over occur?  
A) 10%    B) 15%  
C) 5%    D) 20% *Ans. D*
43. What is the effect of high level glucose in lac operon  
A) Transcription is stimulated  
B) Little transcription takes place  
C) Transcription not affected  
D) Transcription may be stimulated or inhibited depending upon the level of lactose. *Ans. B*
44. In RNA silencing, si RNAs and mi RNAs usually bind to which part of the mRNA molecule that they control  
A) 5'UTR    B) Segments that encodes aminoacids  
C) 3'poly(A) tail                                  D) 3'UTR *Ans. D*
45. DNA binding regulatory proteins are grouped into distinct classes based on the motif found within the binding domains. In the following group which are common bacterial regulatory proteins  
A) Helix –turn- helix                              B) B.zinc finger *Ans. A*  
C) Leucine zipper                                D) Helix –loop -helix
46. In a group of students, about 36% could roll their tongues, a trait determined by a dominant gene (R). The other 64% of the students were nonrollers (r) . The population is in Hardy-Wienberg equilibrium. What is the frequency of the gene R and its recessive allele r?  
A) R=0.3 and r=0.1                              B) R=0.64 and r=0.36  
C) R=0.8 and r=0.2                              D) R=0.2 and r=0.8 *Ans. D*
47. Which of the following changes is a transition base substitution?  
A) Adenine replaced by thymine  
B) Cytosine replaced by adenine  
C) Guanine replaced by adenine  
D) Three nucleotide pairs are inserted into DNA *Ans. C*
48. A genetically engineered squash called Freedom II carries genes from  
A) Watermelon mosaic virus                      B) Zucchini virus  
C) Cauliflower mosaic virus                        D) Both A & B *Ans. D*

49. Which gene is inserted to the target gene to create knockout mice?  
A) 'tk' gene  
B) 'neo' gene  
C) Both A & B  
D) Neither A & B  
**Ans. C**
50. In the following common bioinformatic data bases, which contains protein sequence data?  
A) Gene Bank  
B) EMBL-Bank  
C) dbEST  
D) UniProt  
**Ans. D**
51. Genes found in different species that evolved from same gene in a common ancestor is called  
A) Homologs  
B) Paralogs  
C) Orthologs  
D) Homeologs  
**Ans. C**
52. Which lichen is known as "Reindeer moss?"  
A) *Cladonia rangiferina*  
B) *Peltigera canina*  
C) *Lobaria pulmonaria*  
D) *Rocella montaignei*  
**Ans. D**
53. Proflavin and acridine oranges are chemicals that cause mutations because  
A) They distort the structure of DNA  
B) They chemically modify the normal bases  
C) They are similar in structure to the normal bases  
D) They sandwich between adjacent bases in DNA  
**Ans. D**
54. A codon that specifies aminoacid Tryptophan undergoes a single base substitution that yields a nonsense codon. What is the mutated codon?  
A) UUG  
B) UGA  
C) UAA  
D) UGG  
**Ans. B**
55. The retrovirus genome is  
A) RNA  
B) DNA  
C) RNA in free virus but converted to DNA inside the host cell  
D) DNA in free virus but converted to RNA inside the host cell  
**Ans. C**
56. A recombinant cross is performed between two organisms producing a total of 400 offspring. There were two distinct types of recombinants, with 36 of the first type and 58 of the second type present. The recombination frequency of the gene is  
A) 0.145  
B) 0.235  
C) 0.345  
D) 0.445  
**Ans. B**
57. What are known as "safe havens" during insertion of transposable elements?  
A) Centromere regions  
B) Retrotransposon regions  
C) Heterochromatin regions  
D) All these  
**Ans. D**

58. Total length of life cycle in yeast  
A) 90 minutes B) 1 hour C) 12 hours D) 24 hours  
**Ans. A**
59. P elements are transposable elements found in  
A) Maize B) Yeast  
C) Drosophila D) Arabdiopsis  
**Ans. C**
60. Hammerling performed experiments to prove that nucleus is the physical basis of heredity by working on  
A) *Neurospora crassa* B) *Drosophila melanogaster*  
C) *Acetabularia crenulata* D) *Saccharomyces pombi*  
**Ans. C**
61. Minute granular structures found on the inner face of the thylakoid membrane  
A) Quantasomes B) Diplosomes  
C) Oxysomes D) Lysosomes  
**Ans. A**
62. When a cell with  $2n = 60$  chromosomes undergoes meiosis, each of the four resulting cells has ----- chromosomes  
A) 30 B) 60 C) 40 D) 10  
**Ans. A**
63. The somatic chromosome number ( $2n$ ) of *Arabidopsis thaliana* is  
A) 20 B) 10 C) 5 D) 30  
**Ans. B**
64. The normal sequence of markers on a certain *Drosophila* chromosome is 123.456789, where the dot represents the centromere. One fly was isolated with the following aberration, 1654.32789. What could be the structural aberration involved?  
A) Paracentric inversion B) Deletion  
C) Duplication D) Pericentric inversion  
**Ans. D**
65. If the somatic chromosome number for an organism is  $2n = 16$ , the hexaploid number would be  
A) 16 B) 32  
C) 48 D) 64  
**Ans. C**
66. ----- is a drooping pendant fruticose lichen  
A) *Physcia* B) *Cladonia*  
C) *Usnea* D) *Haematomma*  
**Ans. C**
67. Cyphellae in lichens are analogous to ----- in higher plants  
A) Palisade tissue B) Epidermis  
C) Bundle sheath D) Stomata  
**Ans. D**
68. Which of the following is called 'walking fern'?  
A) *Selaginella rupestris* B) *Selaginella bryopteris*  
C) *Adiantum incisum* D) *Adiantum caudatum*  
**Ans. D**

69. Which of the following has amphiphloic siphonostele?  
A) *Marsillea* B) *Lycopodium*  
C) *Pteris* D) *Dryopteris* **Ans. A**
70. The fossil fern, *Rhynia* was discovered by  
A) Sir William Dawson B) Kidson and Lang  
C) De Bary D) Captain Cooke **Ans. B**
71. Smallest fern among the following is  
A) *Drynaria* B) *Anogramma*  
C) *Cyathea* D) *Woodsia* **Ans. B**
72. Endosperm in gymnosperm is  
A) Generally diploid B) Always haploid  
C) Triploid D) With different ploidy levels **Ans. B**
73. Characters of both conifer and cycads are found in  
A) Ginkgo B) Ephedra  
C) Cupress D) Thuja **Ans. A**
74. The number of neck canal cells in the archegonium of *Cycas* is  
A) 2 B) 4  
C) 6 D) 0 **Ans. D**
75. The dwarf shoots of *Pinus wallichiana* are  
A) Monofoliar B) Bifoliar  
C) Trifoliar D) Pentafoliar **Ans. D**
76. Species that occur in different geographical regions separated by special barrier are  
A) Autogenic B) Allogenic  
C) Allopatric D) Sympatric **Ans. C**
77. Area within the centre of diversity protected from human interference.  
A) Gene sanctuary B) Gene bank  
C) Biosphere D) Microcentre **Ans. A**
78. Which is the age of 'higher gymnosperms'?  
A) Mesozoic B) Palaeozoic  
C) Archaeozoic D) Proterozoic **Ans. A**
79. The storage of energy at consumer's level is  
A) Gross primary productivity B) Secondary productivity  
C) Net primary productivity D) Primary productivity **Ans. B**



80. Ozone in the atmosphere absorbs:  
A) All UV-C  
B) All UV-C and most of UV-B  
C) All UV-A and UV-B  
D) All UV-A and UV-C  
**Ans. B**
81. The taxa which is believed likely to join the endangered category in near future is called:  
A) Extinct  
B) Rare  
C) Vulnerable  
D) Living fossil  
**Ans. C**
82. Total soluble salts in soil are measured by  
A) Tensiometer  
B) Conductivity meter  
C) pH meter  
D) None of these  
**Ans. B**
83. Yeast is an important source of  
A) Vitamin C  
B) Riboflavin  
C) Sugar  
D) Fat  
**Ans. B**
84. Powdery mildews of crops are caused by  
A) Bacteria  
B) Ascomycetes  
C) Phycomycetes  
D) Basidiomycetes  
**Ans. B**
85. A fungus with hyphae containing nuclei from different genomes, the nuclei do not fuse but divide independently and simultaneously as new cells are formed is  
A) Phycomycetes  
B) Zygomycetes  
C) Deuteromycetes  
D) Basidiomycetes  
**Ans. D**
86. The type of ovule in which micropyle and funicle lie in one line  
A) Orthotropous  
B) Anatropous  
C) Amphitropous  
D) Campylotropous  
**Ans. A**
87. Study of pollen grains in honey is known as  
A) Iatropalynology  
B) Aeropalynology  
C) Melissopalynology  
D) Pharmacopalynology  
**Ans. C**
88. Sporopollinin is seen in  
A) Intine  
B) Exine  
C) Endocarp  
D) Mesocarp  
**Ans. B**
89. The common bread wheat is called:  
A) *Triticum aestivum*  
B) *Triticum turgidum*  
C) *Triticum monococcum*  
D) None of these  
**Ans. A**
90. Major component of 'Jeevani' is  
A) *Ocimum basilicum*  
B) *Acorus calamus*  
C) *Trichopus zeylanicus*  
D) *Bacopa monnieri*  
**Ans. C**

91. Predominant ethnic group in Thiruvananthapuram district is:  
A) Kani  
B) Malavedan  
C) Malapandaram  
D) Cholanaikan *Ans. A*
92.  $X^2$  test is used to  
A) Measure the degree of deviation of the experimental result from the expected result  
B) To test the closeness of observed and expected frequency  
C) To test the population variance and sample variance  
D) All of the above *Ans. D*
93. Mode can be located graphically with the help of  
A) Line diagram  
B) Bar diagram  
C) Histogram  
D) Pie diagram *Ans. C*
94. X-ray diffraction analysis is based on  
A) Beer-Lambert's law  
B) Bragg's equation  
C) Partition coefficient  
D) Sedimentation coefficient *Ans. B*
95. Sudan Black B is often used for visualization of  
A) Protein  
B) Carbohydrates  
C) Aminoacids  
D) Lipids *Ans. D*
96. Which instrument is more useful to study the surface details of a specimen?  
A) Phase contrast microscope  
B) Scanning electron microscope  
C) Light microscope  
D) Transition electron microscope *Ans. B*
97. Stock and scion are needed for doing  
A) Budding  
B) Grafting  
C) Layering  
D) None of these *Ans. B*
98. Insecticide that remains active in environment for the longest period of time  
A) Organophosphates  
B) Chlorinated hydrocarbons  
C) Carbonyles  
D) None of these *Ans. C*
99. The large center root of plant used in bonsai is cut off  
A) To dwarf the plant  
B) To cause root branching  
C) To make the root system shallow enough to fit in the container  
D) To simplify the root pruning job *Ans. A*
100. Which vegetable crops use large amounts of nitrogen fertilizer?  
A) Leaf  
B) Root  
C) Fruit  
D) All of these *Ans. D*

101. Rhinoviruses are the causative organism for  
A) Tuberculosis B) Whooping cough  
C) Diphtheria D) Common cold **Ans. D**
102. Bacterial cell divides once in every minute. It takes 1 hour to fill a petri plate. How much time is taken to fill half of the plate?  
A) 59 minutes B) 49 minutes  
C) 30 minutes D) 29 minutes **Ans. A**
103. Infective RNA particles without protein sheath are:  
A) Rickettsia B) Mycoplasma  
C) Virus D) Viroid **Ans. D**
104. Operating system is  
A) A collection of hardware components  
B) A collection of input-output devices  
C) A collection of software routines  
D) All of the above **Ans. C**
105. A data base of current sequence map of the human genome is called  
A) OMIM B) HGMD  
C) Golden path D) GeneCards **Ans. C**
106. Laminarin is the reserve food material of  
A) Chlorophyta B) Rhodophyta  
C) Phaeophyta D) Cyanophyta **Ans. C**
107. *Chlamydomonas* and *Volvox* are similar because  
A) Both of them are motile B) They are filamentous  
C) They are colonial D) They have diploid thallus **Ans. A**
108. Which of the following algal group never produces motile, flagellated cells among any of its members?  
A) Chrysophyta B) Phaeophyta  
C) Chlorophyta D) Rhodophyta **Ans. D**
109. The most primitive algal group is  
A) Green algae B) Brown algae  
C) Red algae D) Blue-green algae **Ans. D**
110. The newly collected specimen which is used as a substitute, when the original type material is missing in a herbarium, is designated as  
A) Lectotype B) Holotype  
C) Neotype D) Isotype **Ans. C**

111. Hypanthodium is the characteristic of  
A) Amorphophallus                      B) Acrocephalus  
C) Ficus                                      D) Euphorbia                                      *Ans. C*
112. A single seeded fruit with inseparably fused testa and pericarp is  
A) Achene                                      B) Caryopsis  
C) Cypsella                                      D) Cremocarp                                      *Ans. B*
113. A family having unisexual flowers with parietal placentation is  
A) Cruciferae                                      B) Euphorbiaceae  
C) Orchidaceae                                      D) Cucurbitaceae                                      *Ans. D*
114. The family Lythraceae belongs to the series  
A) Disciflorae                                      B) Calyciflorae  
C) Heteromerae                                      D) Inferae                                      *Ans. B*
115. The family Amaryllidaceae differs from Liliaceae in having  
A) Actinomorphic to slightly zygomorphic flowers  
B) Inferior ovary  
C) Axile placentation  
D) Perianth of six tepals                                      *Ans. B*
116. The lowest ranking taxa in numerical taxonomy is  
A) Species                                      B) Operational taxonomic unit  
C) Character states                                      D) Variety                                      *Ans. B*
117. Cladistic relationship is expressed in terms of correlation amongst individuals with regard to  
A) Phenotypic characters  
B) Their evolutionary history  
C) Relationship between operational taxonomic unit  
D) Their chromosomal behaviour                                      *Ans. B*
118. Primary centre of origin of rice is  
A) Asia minor centre                                      B) Central Asia centre  
C) Hindustan centre                                      D) Mediterranean centre                                      *Ans. C*
119. Heterosis results from  
A) Harmfull effects of recessive alleles and heterozygosity  
B) Homozygosity  
C) Heterozygosity  
D) Heterozygosity and masking of harmful effects of recessive alleles                                      *Ans.D*
120. Production of a double cross hybrid involves  
A) Two inbreds                                      B) Four inbreds  
C) Six inbreds                                      D) Three inbreds                                      *Ans. B*
- .....