

11. The movement of solutes in the phloem is mainly
 A) Lateral B) Acropetal
 C) Basipetal D) Centripetal
12. The first stable compound in Hatch and Slack cycle is
 A) Pyruvic acid B) Malic acid
 C) Citric acid D) Oxalo acetic acid
13. ----- is an example for sulphur containing amino acid
 A) Aspartic acid B) Methionine
 C) Glycine D) Isoleucine
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
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
16. Endosperm is absent in
 A) Orchidaceae B) Compositae
 C) Poaceae D) Malvaceae
17. Tyloses are
 A) Composite sieve plate B) Specialized laticiferous canals
 C) Tracheal plugs D) Resin ducts
18. In *Dracaena*, secondary vascular bundle is
 A) Bicollateral B) Amphicribal
 C) Collateral D) Amphivasal
19. Osmium tetra oxide is used in electron microscopy as a
 A) Fixing agent B) Mordant
 C) Staining agent D) Precipitator
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

21. Q_{10} refers to
 A) Quantum recharge
 B) Respiratory coefficient
 C) A temperature coefficient
 D) Photosynthetic active radiation (PAR) coefficient
22. Warburg effect explains decreased rate of photosynthesis due to
 A) High concentration of CO_2 B) Low concentration of CO_2
 C) High concentration of O_2 D) Low concentration of O_2
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
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
25. National park is an example of
 A) *In vitro* conservation B) *Ex situ* conservation
 C) *In situ* conservation D) All of these
26. In *Funaria* capsule, the peristome consist of
 A) 16 teeth B) 32 teeth
 C) 64 teeth D) 128 teeth
27. Protonema is found in
 A) *Riccia* B) *Anthoceros*
 C) *Marchantia* D) *Funaria*
28. Western Ghats passes through ----- states in India
 A) 6 B) 4
 C) 7 D) 5
29. Partial or complete loss of virulence in pathogen is called
 A) Abortive parasitism B) Attenuation
 C) Neutralism D) Susceptibility
30. Phytoalexins are produced
 A) During infection B) During flowering
 C) Throughout the lifecycle D) By seedlings only

31. Katte disease of cardamom is caused due to
 A) *Colletotrichum elettariae* B) *Phytophthora medii*
 C) *Cardamom mosaic virus* D) *Fusarium* sp.
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) $\frac{1}{2}$
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
34. What is the sexual phenotype of a diploid fruit fly that has XXYYY sex chromosome?
 A) Male B) Female
 C) Intersex D) Metamale
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) $\frac{2}{3}$
36. How many genotypes are present at a locus with four alleles?
 A) 15 B) 10 C) 8 D) 16
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
38. Which process of DNA transfer in bacteria require a virus
 A) Conjugation B) Transduction
 C) Transformation D) All of these
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
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%

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
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%
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.
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
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
 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
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
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

58. Total length of life cycle in yeast
 A) 90 minutes B) 1 hour C) 12 hours D) 24 hours
59. *P elements* are transposable elements found in
 A) Maize B) Yeast
 C) *Drosophila* D) *Arabidopsis*
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 pombe*
61. Minute granular structures found on the inner face of the thylakoid membrane
 A) Quantasomes B) Diplosomes
 C) Oxysomes D) Lysosomes
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
63. The somatic chromosome number ($2n$) of *Arabidopsis thaliana* is
 A) 20 B) 10 C) 5 D) 30
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
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
66. ----- is a drooping pendant fruticose lichen
 A) *Physcia* B) *Cladonia*
 C) *Usnea* D) *Haematomma*
67. Cyphellae in lichens are analogous to ----- in higher plants
 A) Palisade tissue B) Epidermis
 C) Bundle sheath D) Stomata
68. Which of the following is called 'walking fern'?
 A) *Selaginella rupestris* B) *Selaginella bryopteris*
 C) *Adiantum incisum* D) *Adiantum caudatum*

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

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
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
82. Total soluble salts in soil are measured by
 A) Tensiometer
 B) Conductivity meter
 C) pH meter
 D) None of these
83. Yeast is an important source of
 A) Vitamin C
 B) Riboflavin
 C) Sugar
 D) Fat
84. Powdery mildews of crops are caused by
 A) Bacteria
 B) Ascomycetes
 C) Phycomycetes
 D) Basidiomycetes
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
86. The type of ovule in which micropyle and funicle lie in one line
 A) Orthotropous
 B) Anatropous
 C) Amphitropous
 D) Campylotropous
87. Study of pollen grains in honey is known as
 A) Iatropalynology
 B) Aeropalynology
 C) Melissopalynology
 D) Pharmacopalynology
88. Sporopollinin is seen in
 A) Intine
 B) Exine
 C) Endocarp
 D) Mesocarp
89. The common bread wheat is called:
 A) *Triticum aestivum*
 B) *Triticum turgidum*
 C) *Triticum monococcum*
 D) None of these
90. Major component of 'Jeevani' is
 A) *Ocimum basilicum*
 B) *Acorus calamus*
 C) *Trichopus zeylanicus*
 D) *Bacopa monnieri*

91. Predominant ethnic group in Thiruvananthapuram district is:
 A) Kani B) Malavedan
 C) Malapandaram D) Cholanaikan
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
93. Mode can be located graphically with the help of
 A) Line diagram B) Bar diagram
 C) Histogram D) Pie diagram
94. X-ray diffraction analysis is based on
 A) Beer-Lambert's law B) Bragg's equation
 C) Partition coefficient D) Sedimentation coefficient
95. Sudan Black B is often used for visualization of
 A) Protein B) Carbohydrates
 C) Aminoacids D) Lipids
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
97. Stock and scion are needed for doing
 A) Budding B) Grafting
 C) Layering D) None of these
98. Insecticide that remains active in environment for the longest period of time
 A) Organophosphates B) Chlorinated hydrocarbons
 C) Carbonyles D) None of these
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
100. Which vegetable crops use large amounts of nitrogen fertilizer?
 A) Leaf B) Root
 C) Fruit D) All of these

111. Hypanthodium is the characteristic of
 A) Amorphophallus B) Acrocephalus
 C) Ficus D) Euphorbia
112. A single seeded fruit with inseparably fused testa and pericarp is
 A) Achene B) Caryopsis
 C) Cypsella D) Cremocarp
113. A family having unisexual flowers with parietal placentation is
 A) Cruciferae B) Euphorbiaceae
 C) Orchidaceae D) Cucurbitaceae
114. The family Lythraceae belongs to the series
 A) Disciflorae B) Calyciflorae
 C) Heteromerae D) Inferae
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
116. The lowest ranking taxa in numerical taxonomy is
 A) Species B) Operational taxonomic unit
 C) Character states D) Variety
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
118. Primary centre of origin of rice is
 A) Asia minor centre B) Central Asia centre
 C) Hindustan centre D) Mediterranean centre
119. Heterosis results from
 A) Harmfull effects of recessive alleles and heterozygosity
 B) Homozygosity
 C) Heterozygosity
 D) Heterozygosity and masking of harmfull effects of recessive alleles
120. Production of a double cross hybrid involves
 A) Two inbreds B) Four inbreds
 C) Six inbreds D) Three inbreds

.....