A

23103 **120 MINUTES**

1. During development of embryo in plants, PIN proteins are involved in
   A) Establishment of auxin gradient
   B) Regulation of gene expression
   C) Induction of programmed cell death
   D) Induction of cell division

2. Which among the following are correct statements related to 5'cap of RNA?
   1. Messenger RNA's stability during translation process of protein synthesis
   2. It ensures stability and transport of RNA
   3. Helps in methylation of RNA
   4. Helps in prevention of degradation by exonucleases

   A) 1, 2 & 4 only B) 1, 2 & 3 only
   C) 1, 3 & 4 only D) 2, 3 & 4 only

3. Resin obtained from *Abies balsamea* is:
   A) Canada balsam B) Amber
   C) Sandarac D) Copal

4. Cellular endosperm can be seen in:
   A) *Poa* B) *Areca* C) *Lilium* D) *Peperomia*

5. The geological period during which diversification of Angiosperms occurred:
   A) Cretaceous B) Permian C) Triassic D) Jurassic

6. The enzymes which are involved in bases excision repair:
   A) DNA polymerase I B) DNA glycosylase
   C) DNA polymerase III D) DNA gyrase

7. Which among the following is a hyper-accumulator of Arsenic?
   A) *Sida acuta* B) *Euphorbia hirta*
   C) *Pteris* D) *Riccia*

8. The type of inflorescence found in *Heliotropium* :
   A) Helicoid cyme B) Scorpioid cyme
   C) Verticillaster D) Spike

9. The genes associated with senescence:
   A) CDK1 B) GH1 C) Pelita2 D) Norin10

10. The articles of Botanical Code (ICN 2018) that deal with the conditions of Effective publication:
A) Articles 11-13 B) Articles 14-28
C) Articles 29-31 D) Articles 32-41

11. Ruminate endosperm is seen in -----.
A) *Areca* B) *Cocos*
C) *Gossypium* D) *Habenaria*

12. In India, National Parks are declared under Section ----- of Wild Life (Protection) Act, 1972.
A) 10 B) 18 C) 35 D) 38A

13. Starch grains have different shapes that are characteristics of plants, Match the shapes and plants:

List I	List II
a. Maize	1. Oval
b. Pulses	2. flat
c. Wheat	3. Spherical
d. Potato	4. Polygonal

A) a-4, b-3, c-2, d-1 B) a-3, b-4, c-1, d-2
C) a-1, b-3, c-2, d-4 D) a-4, b-3, c-1, d-2

14. Which among the following bryophyte is known as bottle hepatics?
A) *Andrea* B) *Sphaerocarpos*
C) *Sphagnum* D) *Polytrichum*

15. Which among the following are tumor suppressor genes?
A) L-myc, c-myb, p53 or TP53
B) K-ras, BRCA1, BRCA2, p53
C) c-myb, p53, BRCA1, Rb1
D) BRCA1, BRCA2, p53, Rb1

16. The major characteristics of histone proteins are:
1. Major structural protein of eukaryotic chromosome
2. Present in prokaryotes and sperms of eukaryotes
3. They are high molecular weight water soluble basic proteins with rich lysine content
4. There are seven families of histones

A) 1 & 3 only B) 2 & 4 only C) 1 & 2 only D) 1, 2 & 3 only

17. Student's t test was formulated by:
A) W.S. Gosset B) Pierre-Simon Laplace
C) Karl Pearson D) S.M. Poisson

18. Genes which have a key role in establishing a floral meristem in *Arabidopsis*:
A) CRY gene & LFY B) CRY gene & AP1
C) CDK & AP1 D) LFY & AP1

19. Analyze the statements with reference to Transduction and select the correct statement/s:
1. Transduction happens through either the lytic or the lysogenic cycle.
2. Lytic cycle is a form of viral reproduction involving the fusion of the nucleic acid of a bacteriophage with that of a host, followed by proliferation of the resulting prophage.
3.The lysogenic cycle the normal process of viral reproduction involving penetration of the cell membrane, nucleic acid synthesis, and lysis of the host cell.

A) 1 only B) 3 only C) 1 & 2 only D) 1, 2 & 3

20. Identify the correct difference between Virion and Viroid:
A) Virion is a complete functional virus that has the capacity to infect living tissue, while viroids are the tiniest infectious agents that attack plants.
B) Viroids are DNA particles, while Virion has RNA or DNA.
C) Virion have a protein covering - capsid, whereas viroids do not.
D) Both A & C

21. Identify the correctly matched Fruiting bodies of Fungi:
A) In cup fungi, the spore-producing asci are located on the inner surface of the mature fruiting body. Spores are released in a cloud when the asci break open.
B) Gilled mushrooms have basidia located on the gills on the underside of the cap. The spores are dropped from the gills when mature.
C) The basidia in puffballs are contained entirely within the body of the mushroom. A cloud of spores is released when the outer covering collapses or explodes.
D) All are correct

22. Select the correct statements connected with Deuteromycetes:
1. They reproduce only through asexual spores - conidia.
2. Mycelium is composed of many branched and septate hyphae with multinucleate cells and simple pore septa.
3. Some are saprophytes or parasites, but the majority are decomposers who aid in mineral cycling.
4. It includes Alternaria, Colletotrichum, Trichoderma

A) 1 & 3 only B) 1, 2 & 3 only
C) 2 & 4 only D) 1, 2, 3 & 4

23. Screen the following features with Anthoceros and select the correct statements:
1.Saprophytic body of Anthoceros grows embedded in the gametophytic body.
2. Saprophytic consists of Foot, Intercalary Zone, capsule, columella and Sporogenous tissue
3. Spore is haploid, binucleate and semicircular in shape with a prominent triradiate mark

A) 2 & 3 only B) 1& 2 only C) 1 & 3 only D) 1, 2 & 3

24. Observe the statements connected with Porella and chose the correct ones:
1. Vegetative reproduction takes place by one or two-celled gemmae from the leaf-margins
2. Antherozoids are typically multiflagellate and crescent-shaped.
3. Mature sporophyte is protected by the marsupium, perianth and the multi-layered calyptra.

A) 1 & 3 only B) 1 & 2 only C) 2 & 3 only D) 1, 2 & 3

25. Analyze the statements connected with fossil Bryophytes and select the correct ones:
1. Diettertia, an interesting hepatic, has been identified from Cretaceous era which may be more closely compared with the Marchantiales
2. Naiadita lanceolata spores show the closest resemblance to the member of the Marchantiales and Sphaerocarpales

A) 1 only B) 2 only
C) Both 1 & 2 D) Neither 1 nor 2

26. Select the correct statement linked with Sporocarp of ferns
A) Salvinia sporocarp is globose, the microsporangia and mega-sporangia are borne separately into separate sporocarps, the megaspcrocarps arising above the microsporocarps.
B) In Marsilea each sporocarp is bi-valved bean-shaped or oval in shape and bears both microsporangia and mega-sporangia along the margin
C) In Azolla the sporocarps, the larger one is the microsporocarp bearing fertile microsporangia with a large sterile mega-sporangium while the smaller megasporocarp contains a large fertile mega-sporangium with sterile micro-sporangia
D) All statements are correct

27. Which among the following common medicinal plants used by the Kani tribes?
1. Cyclea peltata 2. Ceropegia spiralis 3. Apama siliquosa

A) 1 & 3 only B) 1 & 2 only C) 2 & 3 only D) 1, 2 & 3

28. Select the correctly matched pairs connected with Gums & Resins:
A) Gum - Acacia Senegal
B) Damars - Vateria indica
C) Amber - Pinus succinifera
D) All the above

29. The activity of normal cambium is abnormal in the plants such as:
A) Bignonia B) Aristolochia
C) Tinospora D) All of these

30. Conditions for the formation of an Ionic Bond is/are:
A) The low ionization energy of the atom forming the cation.
B) High electron gain enthalpy of the atom forming the anion.
C) High negative lattice enthalpy of the crystal formed.
D) All the above

31. Synthetic Cytokinins hormone is/are:
A) Benzyladenine B) Diphenylurea
C) Thidiazuron D) All the above

32. Select correct statements connected with Phototropism:
1. Phototropins are the main photoreceptors responsible for light detection during phototropism
2. More auxin is transported down the shady side, and less auxin is transported down the illuminated side.
3. Peter Boysen-Jensen followed up on this work by showing that a chemical signal produced at the tip was indeed responsible for the bending response in plants

A) 1 & 2 only B) 1 & 3 only C) 2 & 3 only D) 1, 2 & 3

33. Select the correctly matched pairs:
1. Relay-Pump Hypothesis proposed by Boehm
2. Pulsatory Movement Theory proposed by Sir J.C. Bose
3. Root-Pressure Theory proposed by Priestley
4. Capillary Force Theory proposed by Godlewski

A) 1 & 2 only B) 2 & 3 only C) 2 & 4 only D) 1, 2 & 4 only

34. Analyze the statements linked to Fermentation and chose the correct ones:
1. is an anaerobic process, where reduced NAD is produced during the event.
2. is the first process is the same as cellular respiration, which is the formation of pyruvic acid by glycolysis where net 2 ATP molecules are synthesized.
3. In the next step, pyruvate is reduced to lactic acid, ethanol or other products.

A) 1 & 2 only B) 2 & 3 only C) 1 & 3 only D) 1, 2 & 3

35. Type of senescence occurs in the annual plants is known as----- senescence.
A) Overall B) Top C) Progressive D) Deciduous

36. The interaction between the bacteria and host legume is so intricate that the particular bacteria will only nodulate in a selected number of plant genera. This host specificity is referred to cross inoculation group cell signaling between the bacteria and the legume host. The aforementioned Nod factors have been identified as:
A) lipochition oligosaccharides
B) Like molecule leghemoglobin
C) Mucopolysaccharides
D) Both A & B

37. Identify the enzyme involved in biosynthetic pathway of purine nucleotides
A) Amido phosphoribosyltransferase
B) Carbamoyl phosphate synthetase
C) Aspartate transcarbamoylase
D) Dihydroorotate dehydrogenase

38. Which among the following is/are example/s for aldohexose sugar?
A) Glucose B) Mannose C) Galactose D) All of these

39. Which among the following is an example for Essential amino acid?
A) Cysteine B) Arginine C) Threonine D) Aspartate

40. The most abundant sterols in plants and the human diet are:
A) stigmasterol B) β-sitosterol
C) campesterol D) All the above

41. Enzyme kinetics plot in which the x-axis is the reciprocal of the substrate concentration or 1 / [S], and the y-axis is the reciprocal of the reaction velocity or 1 / V is known as:
A) Lineweaver Burk plot B) Michaelis-Menten
C) Eadie–Hofstee plot D) Ping–pong plot

42. Gibbs free energy of a system at any moment in time is defined as the enthalpy of the system minus the product of the temperature times the entropy of the system i.e., G = H – TS Where H is:
A) H+ concentration B) Enthalpy
C) Free energy D) Entropy

43. Palynology studies of pollen and spores in honey is known as:
A) Entomopalynology B) Copropalynology
C) Forensic palynology D) Melissopalynology

44. Fruit that develops from the ovaries of many flowers growing in a cluster or that are fused together into a larger fruit is seen in:
A) Milkweed B) Pineapple C) Polyalthia D) Blackberries

45. Clade is a------.
A) Group of organisms that includes an ancestor and all of its descendants
B) Mismatched group of organisms that includes an ancestor and all of its descendants
C) Diverse group of organisms that includes its ancestor
D) Unit that includes all of its descendants

46. When a classification does **not** include all the descendants of the most recent common ancestor, it is termed:
A) Ingroup B) Polyphyletic
C) Monophyletic D) Paraphyletic

47. Read the statements connected with electron Microscopy and choose the correct statement/s:
1. Transmission electron microscopy (in which the electron beam travels through the specimen)
2. Scanning electron microscope (SEM), in which a beam of electrons is scanned over the surface of a solid object, is used to build up an image of the details of the surface structure

A) 1 only B) 2 only C) Both 1 & 2 D) Neither 1 nor 2

48. Sweet potatoes are a staple food in many parts of the world and is an example for sugar yielding plant belongs to the family:
A) Fabaceae B) Rutaceae
C) Solanceae D) Convolvulaceae

49. Analyze the statements connected with Botanical Survey of India and chose the correct ones:
1. East India Company (EIC) established the Botanical Survey of India (BSI) in 1890, during the pre-independence era. Kolkata, West Bengal, is the location.
2. The Ministry of Environment, Forestry, and Climate Change is its parent institution
3. BSI has also developed a digital platform 'Indian Plant Diversity Information System (IPDIS)

A) 1 & 2 only B) 1 & 3 only C) 2 & 3 only D) 1, 2 & 3

50. Which among the following is/are members of the family Annonaceae?
A) Polyalthia longifolia B) Liriodendron tulipifera
C) Virola guatemalense D) Both A & B

51. Identify the family using the characters:
Herbs or undershrubs; sap not milky; Flowers – Minute, unisexual, regular, Stamens as many as perianth parts and opposite to them, inflexed in bud and exploding when ripe, Carpel 1; ovary inferior or superior; ovule erect; style single, with a brush-like stigma. Fruit – Achene or drupe

A) Urticaceae B) Amaranthaceae
C) Euphorbiaceae D) Portulacaceae

52. Identify the correct statement/s with Apoptosis:
1. Extrinsic Pathway triggers apoptosis in response to external stimuli, like, ligand binding at death receptors on the cell surface. These receptors are members of the Tumor Necrosis Factor gene family. The receptor binding initiates caspase activation.
2. Intrinsic Pathway triggers apoptosis in response to internal stimuli such as biochemical stress, DNA damage and lack of growth factors. This pathway is modulated by two groups of molecules- Bax, and Bcl-2.

A) 1 only B) 2 only C) Both1 & 2 D) Neither 1 nor 2

53. Select the correct Chromosomal disorder from the options given below:
A) Chromosomal disorder is trisomy 21 is the primary cause of Down syndrome.
B) Turner syndrome, is a common genetic condition where a male is born with an extra X chromosome
C) Klinefelter syndrome a condition that affects only females, results when one of the X chromosomes (sex chromosomes) is missing or partially missing
D) Edwards' syndrome has 4 copies of chromosome number 14 instead of 2

54. The protein located in the cell membrane that binds extracellular substances and transmits signals from these substances to an intracellular molecule; it can trigger only one cell response from a single ligand binding is known as:
A) G-protein coupled receptors
B) Second messengers like hydrogen peroxide coupled reaction
C) Tyrosine Kinase Linked receptors
D) Steroid hormone receptors

55. Observe the statements and select the correct excision repair statement/s:
1. Base excision repair is a pathway that repairs replicating DNA throughout the cell cycle.
2. Nucleotide excision repair is a pathway that repairs constantly damaging DNA due to UV rays, radiation and mutagens

A) 1 only B) 2 only C) Both 1 & 2 D) Neither 1 nor 2

56. Match List I with List II

List I	List II
a.Bharatpur Bird Sanctuary	1. Uttarakhand
b.Chilika Lake Bird Sanctuary	2.Kerala
c.Chinnar Wildlife Sanctuary	3.Odisha
d.Govind Wildlife Sanctuary	4.Rajasthan

A) a-3, b-4, c-2, d-1 B) a-2, b-1, c-3, d-4
C) a-1, b-2, c-3, d-4 D) a-4, b-3, c-2, d-1

57. The first linkage map was developed by:
A) Thomas Hunt Morgan B) Alfred Sturtevant
C) Kehrer- Sawatzk D) Tyler-Smith

58. Read the statements connected with Polyclonal antibodies and select the correct ones:
1.Refer to a mixture of immunoglobulin molecules that are secreted against a particular antigen
2. Interact with a particular epitope on the antigen
3. Production does not require hybridoma cell lines

A) 1 & 3 only B) 1 & 2 only C) 3 only D) 1, 2 & 3

59. A molecular process through which some cells can make discrete changes to specific nucleotide sequences within an RNA molecule after it has been generated by RNA polymerase is known as:
A) Exon shuffling B) RNA editing
C) Alternative splicing D) tRNA charging

60. Scanning probe microscopes includes:
A) Atomic force microscope
B) Scanning tunnelling microscope
C) Magnetic force microscope
D) All of these

61. What is factor analysis?
A) Statistical method used to describe variability among observed, correlated variables in terms of a potentially lower number of unobserved variables
B) Any statistical test for which the distribution of the test statistic under the null hypothesis can be approximated by a normal distribution
C) An inferential statistic used to determine if there is a significant difference between the means of two groups and how they are related
D) A test of whether or not your linear regression model provides a better fit to a dataset than a model with no predictor variables

62. Two spectroscopic methods for the determination of the absolute configuration i.e., Optical Rotatory Dispersion and Circular Dichroism. These methods depend on:

A) The behavior of polarized light passing through a solution (usually) of the optically active compound
B) Cocktails absorb the energy emitted by radioisotopes and re-emit it as flashes of light
C) Relies on the interaction of electromagnetic radiation in the range of 0.01–10 nm
D) Involves applying electrical energy in the form of spark generated between an electrode and a metal sample, whereby the vaporized atoms are brought to a high energy state

63. Which among the following is/are chemical fusogens used in protoplast fusion?

A) Sodium nitrate solution B) Polyethylene glycol
C) Polyvinyl alcohol D) All the above

64. Genetically distinct geographic variety, population, or race within a species, which is genotypically adapted to specific environmental conditions is known as:

A) Ecotype B) Ecads
C) Key stone species D) Edge species

65. Analyze the statements connected to State Medicinal Plants Board, Kerala and select the correct ones.

1. SMPB was constituted under the administrative jurisdiction of Health and Family Welfare Department, Govt.of Kerala in 2002, as per the direction of the Dept. of AYUSH, Govt. of India.
2. Aim of the SMPB is to co-ordinate matters relating to the Cultivation, Conservation, Research & Development and Promotion of medicinal plants sector
3. Grahachaithanyam project (one Neem and one curry leaf in each households),Grameenam for health and wealth (cultivation of medicinal plants cum ex-situ conservation) are some examples

A) 1 & 2 only B) 1 & 3 only C) 2 & 3 only D) 1, 2 & 3

66. Observe the statements and select the true types.

1. Autopolyploidy appears when an individual has more than two sets of chromosomes, both of which from the same parental species.
2. Allopolyploidy, on the other hand, occurs when the individual has more than two copies but these copies, come from different species

A) 1 only B) 2 only C) Both1 & 2 D) Neither 1 nor 2

67. The Protection of Plant Varieties and Farmers' Rights (PPV&FR) Act, 2001 includes
1. Breeders Rights 2. Researchers Rights 3. Farmers Rights

A) 1 & 2 only B) 1 & 3 only C) 2 & 3 only D) 1, 2 & 3

68. Read the statements and chose the correct ones:
1. Swiss-Prot is an annotated protein sequence database
2. UniProt is the Universal Protein resource, a central repository of protein data created by combining the Swiss-Prot, TrEMBL and PIR-PSD databases

A) 1 only B) 2 only C) Both1 & 2 D) Neither 1 nor 2

69. An ozone-depleting substance (ODS) is mainly used in:
1. Burning fossil fuels 2. Chimneys 3. All human activities
4. Cooling, refrigeration applications, and in the manufacture of foam products.

A) 1& 2 only B) 1, 2 & 3 only
C) 4 only D) 1, 2, 3 & 4

70. Name the Greenhouse gas with increased global warming potential:
A) Carbon dioxide B) Methane
C) Nitrous oxide D) Sulphur hexafluoride

71. Communities were largely a coincidence of individualistic species characteristics, continuously varying environments and different probabilities of a species arriving on a given site is the concept of:
A) Gleason B) Clements C) Raunkiaer D) Whittaker

72. Biodiesel production is the process of producing the biofuel through the chemical reactions of transesterification and esterification. Which among the following is/are examples for Biodisel Plants?
1. Soybeans 2. Sunflower 3. Jatropha

A) 1 only B) 1 & 3 only C) 2 & 3 only D) 1, 2 & 3

73. The CITES Secretariat is administered by ----- and is located at Geneva, Switzerland.
A) UNEP (The United Nations Environment Programme)
B) United Nations Educational, Scientific and Cultural Organization (UNESCO)
C) International Monetary Fund (IMF)
D) United Nations Development Programme (UNDP)

74. Observe the statements and select the true types:

1. European Molecular Biology Laboratory (EMBL) Nucleotide Sequence Database is a comprehensive collection of primary nucleotide sequences maintained at the European Bioinformatics Institute

2. DDBJ is the Protein Data Bank is a database for the three-dimensional structural data of large biological molecules, such as proteins and nucleic acids.

A) 1 only B) 2 only C) Both 1 & 2 D) Neither 1 nor 2

75. Atomic Absorption Spectrometry (AAS) Systems and Technologies consists of:

A) The sample introduction area
B) The light (radiation) source
C) Monochromator or polychromator
D) All the above

76. Which of the following statements are true concerning methanogens?

1. They belong to the domain Archaese
3. They are strictly anaerobic
4. They thrive in sewage and sludge

A) 1 & 2 only B) 1, 2 & 3 only
C) 1 & 3 only D) 3 only

77. Who proposed Contagium vivumfluidum:

A) Stanley B) Robert Hooke
C) D. J Ivanowsky D) M.W. Beijerinck

78. Bacterial cell division is prompted by Ftz protein, whose function is analogous to which cytoskeletal system protein in eukaryotes:

A) Actin
B) Tubulin
C) Intermediate filament proteins
D) Barstar

79. *Pseudomonas stutzeri* is known for its global importance in terms of:

A) Producing fermented products
B) Producing Sulfur products
C) Denitrification
D) Phototrophic metabolism

80. Proteopathy refers to a disease when proteins become structurally abnormal and thereby disrupt the function of cells, tissues and organs of the body. Which among the following disease come under this category caused by prions?
A) Creutzfeldt–Jakob disease
B) Alzheimer's disease
C) Parkinson's disease
D) Amyloidosis

81. Which of the following is/are characteristics of HIV?
A) Morphology with a sarcophagus
B) Possessing a reverse transcriptase (RT)
C) Causes immune deficiencies
D) All the above

82. Retroviruses were discovered first?
A) In chickens as Rous sarcoma
B) In humans as HTLV-1
C) In mice causing leukaemia
D) In cats causing leukaemia

83. Largest virus reported was:
A) Pox virus
B) Pencillium virus
C) Wound tumour virus
D) None of the Above

84. Major Photosynthetic pigments in brown algae are?
A) Chlorophyll a and b
B) Chlorophyll a, c and Fucoxanthin
C) Chlorophyll a, d and Fucoxanthin
D) Chlorophyll a and c

85. Which among the following is known as frog–spawn alga?
A) Volvox
B) Gelidium
C) Gracilaria
D) Batrachospermum

86. Choose the correct match for algal class with its characteristic reserve food:

A) Chlorophyceae – Mannitol
B) Phaeophyceae – Laminarin
C) Rhodophyceae – Starch
D) Diatoms – Floridean starch

87. Saxitoxin is a nerve toxin produced by Anabaena. This is chemically a:
A) Cyclic peptide
B) Alkaloid
C) Polyketide
D) Aminoacid

88. 'Kombu' – a Japanese delicacy is made from the algae:

A) Chlorella B) Spirogyra
C) Laminaria D) Chondrus crispus

89. Match the List 1 with List II

List I	List II
a. Edible delicacies	1. Pencillium, streptomyces
b. Experimental Genetics	2. Neurospora crassa
c. Source of antibotics	3. Puccinia, Ustilago
d. Rust and Smut diseases	4. Morels and truffles

A) a-2, b-4, c-1, d-3 B) a-4, b-2, c-3, d-1
C) a-4, b-2, c-1, d-3 D) a-2, b-4, c-3, d-1

90. Largest known fungus was:

A) *Armillaria ostoyae*
B) *Ophiostoma ulmi*
C) *Cochliobolus heterostrophus*
D) *Taphrina deformans*

91. Vulpinic acid is a metabolite secreted by Lichens. Which amino acid is the precursor of this natural product?

A) Glutamine B) Glycine
C) Phenylalanine D) Arginine

92. Polyploid endosperm can be traced in which Gymnosperm?

A) Gnetum B) Welwitschia C) Ephedra D) All the above

93. Which of the following is **not** an active principle of *Ocimum sanctum*?

A) Germacrene D B) β-caryophyllene
C) Ergosterol D) Artemisinic acid

94. Phytohemagglutinin is a plant protein which is chemically bind to carbohydrates which precisely addressed as:

A) Flavonoid B) Terpenoid C) Lectin D) Tannin

95 *Lachryma papaveris* is the binomial nomenclature of:

A) Cannabis B) Poppy C) Tobacco D) Avicinna

96. Todallia asiatica is used as a remedy for treating rheumatism. It belongs to the family:

A) Rubiacae B) Rutaceae
C) Ranunculaceae D) Rhamnaceae

97. Helicteris isora is traditionally used to treat cuts and wounds. It belongs to the family:
A) Solanaceae B) Sapindaceae
C) Sterculiaceae D) Scrophulariaceae

98. Which of the following always divides by anticlinal division?
A) Mass meristem B) Vascular cambium
C) Plate meristem D) Rib meristem

99. The process that is employed to remove liquid from the samples in a precise and controlled way prior to an ultrastructural examination is called:
A) Quenching B) Photobleaching
C) Supercritical drying D) Blanching

100. Which among the following function as an inhibitor for parthenocarpy?
A) Brassinosteroids B) Gibberellic acid
C) Melatonin D) Coumarins

101. In adventive embryony, a type of apomixis, the embryo develops directly from the:
A) Zygote
B) Accessory embryo sacs in the ovule
C) Antipodals or synergids in an embryo sac
D) Integuments or nucellus

102. Identify the **incorrect** statement from the following:
A) Assimilatory roots are present in Tinospora and Trapa
B) Haustoria of cuscuta make connections with both xylem and phloem
C) Active roots of Ipomea help in vegetative propagation
D) Epiphytic roots of Vanda possess well developed root cap and root hairs

103 Water potential of pure water at standard temperature is equal to?
A) 10 B) 20 C) zero D) -10

104. Deficiency symptoms of an element tends to appear first in young leaves. It indicates that the element is relatively immobile. Which one of the following elemental deficiencies would show such symptoms?
A) Sulphur B) Magnesium C) Nitrogen D) Potassium

105. The symbiotic bacteria that help in nitrogen fixation with non-legumes:
A) Rhizobium B) Bradyrhizobium
C) Frankia D) Cyanobacteria

106. Which of the following causes seed dormancy?
A) Phenolic acid B) Abscicic acid
C) Para ascorbic acid D) All of these

107. Phytochrome is attached to the chromophore using ----- residue.
A) Glutamate B) Cysteine
C) Aspartic residue D) Glycine residue

108. Which among the following amino acid aid is involved in osmoregulation in plants?
A) Aspartic acid B) Glutamine
C) Proline D) Cysteine

109. Which of the following enzyme leads to glycogen storage disease known as Tarui's disease?
A) Glucokinase B) Pyruvate Kinase
C) Phosphofructokinase D) Phosphoglucomutase

110. The number of double bonds in Arachidonic acid is:
A) 1 B) 2 C) 3 D) 4

111. Which fluorescent dye can be used for red fluorescence?
A) Rhodamine B) Fluorescein C) Carmine D) DAPI

112. Which of the following reaction is required for proof reading during DNA replication by DNA polymerase III?
A) 5' to 3' exonuclease activity
B) 3' to 5' exonuclease activity
C) 3' to 5' endonuclease activity
D) 5' to 3' endonuclease activity

113. A mutation in the trp binding site of the repressor would result into:
A) Constitutive trp operon expression
B) Inducible trp operon expression
C) No operon expression
D) None of the above

114. The first protein complex to bind to the TATA box is:
A) Transcription factor IIA
B) Transcription factor IIB
C) Transcription factor IID
D) All of these

115. When heterozygous yellow round seed plants are self-fertilized, the frequency of occurrence of RrYY genotype among the offspring's is:
A) 1/16 B) 3/16 C) 2/16 D) 4/16

116. You cross a **p+/v+ p+/v+** male drosophila to a **p-/v- p-/v-** and obtain the F1 hybrid. Now you cross the F1 male with double recessive female. What will be the recombination phenotype in F2?

A) p+/v+ p-/v- only

B) p+/v+ p-/v- and p-/v- p-/v-

C) p+/v+ p-/v- and p-/v- p-/v- also p+/v- p-/v- and p-/v- p-/v-

D) p+/v+ p-/v- and p-/v- p-/v- also p-/v+ p-/v- and p-/v- p-/v-

117. Which of the following does **not** belong to the Hardy Weinberg principle?

A) Frequency remained fixed through generations
B) Used algebraic equations
C) Allele frequency varies from species
D) Gene pool remains a constant

118. Choose the correct statement regarding Founder effect:

A) Named after the scientist John Founder
B) No large change in frequency
C) The old population become founders
D) Formation of new species

119. Pattern recognition receptors (PRR) include:

A) PAMPs
B) Lipoteichoic acid
C) Lectin-like molecules
D) Unmethylated CpG sequences

120. Shelford's law of tolerance suggests that organisms with a wide tolerance limit for environmental factors show:

A) Narrow distribution with low population
B) Wide distribution with low population
C) Wide distribution with high population
D) Narrow distribution with high population