A

19203 **120 MINUTES**

1. Which of the following symmetry is exhibited by the respiratory infectious agents- Adenoviruses?
   A) Helical symmetry B) Circular symmetry
   C) Icosahedral symmetry D) Complex structure symmetry

2. Name the algal group containing oil, lipid and lucosin as the reserved food materials
   A) Chlorophycophyta B) Phaeophycophyta
   C) Xanthophycophyta D) Bacillariophycophyta

3. Analyze the following features in relation to Oedogonium and select the correct statements
   1. Asexual reproduction takes place by multi- flagellate zoospore, where flagella are arranged around the beak-like apical region.
   2. Nannandrous species are always dioecious (heterothallic) i.e., antheridia and oogonia are borne on different filaments. In this type the antheridia develop on a very small filament termed as dwarf male or nannandrium.
   3. The androspores, antherozoids and zoospores are morphologically alike but differ in their size and numbers

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

4. Select the correct features of Polysiphonia
   1. Branches of limited growth are called trichoblasts, spirally arranged, dichotomously branched, colourless and may develop both from main axis and long branches.
   2. The diploid part of the cystocarp represents the carposporophyte. The carposporangium develops single diploid carpospores.

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

5. Identify the species that possess the following features:
   The archegonia are deeply sunk in the apical cushion. They have a very short neck, an egg cell, a venter canal cell and a two nucleate neck canal cell.
   A) Salvinia B) Pteris C) Marsilea D) Psilotum

6. The fruiting bodies of slime moulds are called -----.
   A) acervulus B) sori C) apothecium D) perithecium

7. Name the infectious RNA particle without the protein coat

A) Viroid B) Virion C) Virusoid D) Priones

8. Match Group I (Fungal groups) with Group II (Features)

Group I	**Group II**
1. Ascomycetes	a. Asexual reproduction occurs by means of conidia
2. Zygomycetes	b. Sexual spore are produced externally on a basidium
3. Deuteromycetes	c. Hypahe are generally aseptated
4. Basidiomycetes	d. Hyphae are generally septated

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

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

9. Which among the following lichen is/are used as a source of food?

1. Iceland moss (*Cetraria islandica*) 2. Wila (*Bryoria fremontii*)
3. Rock tripe (*Umbilicaria esculenta*)

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

10. Analyze the features of the group and select the correct statement/ statements

1. Hepaticae: Each cell in the thallus contains many chloroplasts; the chloroplasts are without pyrenoids.
2. Anthocerotae: Each cell of the thallus possesses a single large chloroplast with a pyrenoid.

A) 1 is correct and 2 is wrong B) 1 is incorrect and 2 is correct

C) 1 and 2 are correct D) I & 2 are wrong

11. Name the family displaying these features related with carpel

Gynoecium is bicarpellary, superior, Ovary-2-4-celled, placentation axile, ovule 1 or 2 in each loculus, Style-Simple, terminal, rarely gynobasic

A) Rubiaceae B) Verbenaceae C) Solanaceae D) Lamiaceae

12. Peltate disc is the characteristic feature of strobilus from the pteridophyta member

A) Equisetum B) Selaginella C) Marselia D) Psilotum

13. In the mature sporocarp of Marsilea, ------ cells gelatinise and form a gelatinous ring which helps in the dehiscence of the sporocarp at maturity.

A) outer epidermis B) middle hypodermis

C) inner parenchymatous zone D) All the above

14. Telome concept has been used in understanding the origin and evolution of the major groups of pteridophytes. Select the correct sequence of the evolutionary processes associated with the Telome theory

A) i) Overtopping (ii) Reduction (iii) Plantation (iv) Syngenesis or webbing (v) Curvation

B) i) Overtopping (ii) Plantation (iii) Reduction (iv) Curvation (v) Syngenesis or webbing

C) i) Overtopping (ii) Reduction (iii) Syngenesis or webbing (iv) Plantation (v) Curvation

D) i) Overtopping (ii) Syngenesis or webbing (iii) Reduction (iv) Plantation (v) Curvation

15. The dry, one seeded and indehiscent fruit with the pericarp and testa does not rupture when they fall on ground. The pericarp is membranous or leathery and free from seed coat or testa is known as:

A) Achene B) Caryopsis C) Samara D) Cypsella

16. Acid dyes are those with a negative charge (i.e. acidic auxochromes) and are more properly referred as anionic dyes. Which among the following are examples of acid dyes?

A) Eosin B) orange G C) picric acid D) All the above

17. With reference to biogeo-chemical cycling of phosphorus, consider the following statements:

Which of the statements given below is/are correct?

1. The natural reservoir of phosphorus is atmosphere, which contains phosphorus in the form of phosphates.
2. Herbivores and other animals obtain phosphorus from plants.
3. Unlike nitrogen cycle, there is no gaseous release of phosphorus into the atmosphere.

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

18 Name the family which possesses the following features such as Gigantic trees with an abundant resin; coracious leaves; flower actionomorphic, hermaphrodite, hypogynous; sepals 5, polysepalous, persistent; petals 5, polypetalous; stamens many in one to several whorls, slightly polyandrous, carpels 3, syncarpous, superior; Fruit samara enclosed in persistent sepals.

A) Dipterocarpaceae B) Tiliaceae

C) Sterculiaceae D) Meliaceae

19. *Andropogon aromaticus* Sieber ex Schult. In the above given example of binomial nomenclature with author citation what the word '**ex**' refers

A) Article 47 of the botanical code, on occasion either the diagnostic characters or the circumscription of a taxon may be altered sufficiently that the attribution of the name to the original taxonomic concept as named is insufficient. The original authorship attribution is not altered in these cases, but a *taxonomic* statement can be appended to the original authorship using the abbreviation

B) It denotes the fact that an initial description did not satisfy the rules for valid publication, but that the same name was subsequently validly published by a second author or authors (or by the same author) in a subsequent publication

C) If the subsequent author makes clear that the description was due to the earlier author (and that the earlier author accepted the name), then "ex" is used

D) It is employed to indicate that the authorship of the published work is different from that of the name itself

20. Name the antibiotic produced by *Streptomyces orientalis*?

A) Cephalosporins B) Cycloserine
C) Bacitracin D) Vancomycin

21. Name the morphology of the jute fiber

A) phloem fiber B) mesocarp fiber
C) xylary fiber D) seed coat fiber

22. Select correct statements related with soft wood

1. Produced from gymnosperm trees which usually have needles and cones. Medullary rays and tracheids transport water and produce sap. When viewed under a microscope, softwoods have no visible pores because of tracheids.
2. Softwoods have a wide range of applications and are found in building components (e.g., windows, doors), furniture, medium-density fiberboard (MDF), paper
3. Most softwood has a lower density. Less expensive compared to hardwood.

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

23. Anomalous secondary growth in Dracaena is due to

1. Extra stelar cambial ring in a monocot stem at the ground tissue
2. Abnormal activity of cambium

A) 1 only B) 2 only C) both 1 & 2 D) neither 1 nor 2

24. Histochemical localization of proteins is carried using

A) Sudan Black B) Coomassie Brilliant Blue
C) Periodic acid schiffs reagent D) Iodine in potassium iodide solution

25. The maturity of sporangia within a sorus is varied. Identify the species where, the sorus type is a simple i.e., all the sporangia develop simultaneously

A) Osmunda B) Hymenophyllum
C) Pteris D) Adiantum

26. Half of the wetlands were disappeared. Which of the following is/are perceived as threats to wetlands?

1) Aquaculture 2) Demographic pressure 3) Pollution

A) 1 & 2 B) 2 & 3 C) 1 & 3 D) All of the above

27 Amphimixis is development of an organism obtained through

A) Apospory B) Apogamy
C) Fusion of gametes D) Without fusion of gametes

28. 'Pollen kitt' a sticky coloured pollen coating material and is chiefly made of

A) Chlorophylls B) Lipids
C) Carotenoids D) Both B and C

29. When pollen grains are not transferred from anthers to stigma in a flower, due to the barrier, it is called

A) cleistogamy B) herkogamy C) dichogamy D) heterogamy

30. Identify the correct the sequence of development during the formation of embryo sac:

A) archesporium → megaspore → megaspore mother cell → embryo sac
B) megasporocyte → archesporium → megaspore → embryo sac
C) megaspore → megaspore mother cell → archesporium → embryo sac
D) archesporium → megaspore mother cell → megaspore → embryo sac

31. Nodule formation of leguminous plant roots is retarded with the deficiency of

A) Sulphur B) Boron C) Nitrogen D) Both A and B

32. Ecosystem consists of various biotic components. Identify the primary consumers in the detritus food chain

A) Herbivorous B) Bacteria and fungi
C) Insect Larva, nematodes D) All the above

33. Forests are unique repositories of biodiversity. Which forests have maximum diversity?

A) Sub tropical rainforests B) Coniferous forest
C) Tropical forests D) Deciduous forest

34. Transpiration is regulated by many environmental parameters. Identify the condition in which there will be least amount of transpiration

A) Good soil moisture B) High wind velocity
C) Dry environment D) High atmospheric humidity

35. Which among the following statements is/are associated with aquaporins?

A) They are the integral membrane proteins.

B) 2003 Nobel Prize in Chemistry was awarded jointly to Peter Agre & Roderick MacKinnon

C) They selectively conduct water molecules in and out of the cell, while preventing the passage of ions and other solutes.

D) All the above

36. The objective of Chipko Movement was to protect the trees on the Himalayan slopes from the axes of contractors of the forest. Name the village in which the movement was originated

A) In Chamoli district B) Marwar region

C) Singhbhum district D) Tehri

37. Which of the following yeast is used for the production of riboflavin?

A) Saccharomyces cerevisiae B) Eremothecium ashbyi

C) Saccharomyces rouxii D) Candida utilis

38. The fatty acids of phospholipids have different lengths and unsaturation and also with diverse chemistry in their head groups. Which techniques independently or in combination yield complete picture of the chemical description of the phospholipids?

A) Only thin layer chromatography (TLC)

B) TLC and gas chromatography

C) Paper and thin layer chromatography

D) Only paper chromatography

39. Which of the following RNA polymerases are involved in the synthesis of 5S rRNA?

A) RNA polymerase I B) RNA polymerase II

C) RNA polymerase III D) RNA polymerase IV

40. Match the Group I with Group II

Group I	Group II
a. Stadler	1.First Mutation breeding event in USSR
b. Auerbach & Rohion	2.Mutagenic activity of gamma rays
c. Muller	3. Mutagenic ability of mustard gas
d. Nilsson Ehle	4. Mutagenic activity of X ray on fruit fly

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

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

41. Secondary databases are called so because they contain the analysis results of the sequences in the primary sources. Which among the following is/are examples for secondary data base?

A) Prints- fingerprint database B) Prosite

C) Both A & B D) PIR-PSD

42. Sugars are actively loaded from apoplast to sieve tubes by an energy driven transport located in the plasma membrane of the cells. The mechanism of phloem loading in such case has been called as

A) sucrose -H^+ symporter B) sucrose -H^+ antiport
C) sucrose -H^+ uniport D) Both A & C

43. ------- enclosed research greenhouse used for conducting studies of many types of controlled environment experiments with plants

A) Geoponics B) Phytotron C) Areoponics D) Hydroponics

44. Giberellins are synthesized in the apical shoot buds, root tips and developing seeds. The hormone promotes

A) Seed germination B) Seed dormancy
C) Apical dominance D) Root elongation

45. Identify the adaptive or acclimation response/s to high temperatures

A) Altered membrane fatty acids more saturated fatty acids that don't melt as readily
B) Production of heat shock proteins (HSPs) in response to rapid heat stress
C) Increased synthesis of gamma-aminobutyric acid (GABA)
D) All the above

46. Compatible solutes, also known as osmolytes, are a group of chemically diverse organic compounds that are uncharged, polar, and soluble in nature and do not interfere with the cellular metabolism even at high concentration. Which among the following is example/s for osmolytes?

A) glycine betaine B) polyamines
C) polyols D) both A & C

47. Which of the following simple sugar pair is an example of Epimers?

A) Glucose & Galactose B) Glucose & Ribose
C) Mannose & Glucose D) Fructose & Glucose

48. Janus green B is a basic dye and vital stain used in histology and is used to stain

A) Mitochondria B) Chloroplast
C) Golgi complex D) Vacuoles

49. Estuaries are coastal body of brackish water. Consider following statements about the estuary

I) Estuary is place where the river fresh water meets with ocean water
II) This area is highly productive
III) This area is highly unproductive
IV) All of the above

Which of the above statements is/are true?

A) I only B) II only C) I and II D) III only

50. India is the fifth largest producer of e-waste discarding roughly 18.5 lakh tons per year. Which among the following metals are enlisted under e waste?
1. Mercury 2. Cadmium 3. Beryllium 4. Barium

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

51. Match the Group I (industrial products mentioned) with Group II (their producer organism)

Group I	**Group II**
a. Citric acid	1. *Trichoderma viride*
b. Cellulase	2. *Clostridium acetobutylicum*
c. Vitamin B12	3. *Aspergillus niger*
d. Butanol	4. *Propionibacterium freudenreichii*

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

52. Which characteristic is shared by the nitrogen bases - purines and pyrimidines?
A) Both contain two heterocyclic rings with aromatic character.
B) Both can form multiple non-covalent hydrogen bonds.
C) Both exist in planar configurations with a hemiacetal linkage.
D) Both exist as neutral zwitterions under cellular conditions.

53. The drug flurouracil is generally recommended for treating cancer. It undergoes a series of transformations and then finally binds to the enzyme thymidylate synthase resulting in its inhibition and there by the cell division. This is a classic example for
A) Allosteric inhibition B) Competitive inhibition
C) Non-competitive inhibition D) Suicidal inhibition

54. Select the correct statement/s from the given points related with carbon assimilation
1. The C3 best adapted to cool wet environments
2. C4 and CAM plants are adapted to hot, dry areas
3. stomata open in day time in C3 and C4 plants
4. stomata open in night in CAM plants

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

55. The statistical tool employed to validate the statement - places having high levels of carbon monoxide leads to carboxy hemoglobin tragedy in humans
A) Students *t* test
B) Regression analysis
C) Pearson correlation coefficient
D) ANOVA

56. Which of the following activities are banned in eco-sensitive zones as notified by MoEFCC?

1) Flying over protected areas in an aircraft
2) Commercial use of firewood
3) Setting up of hotels and resorts
4) Commercial mining
5) Setting of saw mills

A) 2, 3, 4 B) 2, 3, 4, 5 C) 1, 2, 4, 5 D) All of the above

57. The enzyme may create a charge distribution opposite to that of the transition state. This lowers the energy of the transition state and ------- the activation energy

A) Increases B) Decreases C) no change D) unpredictable

58. Amino acids are amphoteric molecules. Which of the following statement about amino acids is correct?

A) Amino acids are uncharged at neutral pH
B) Amino acids are classified according to the structures and properties of their side chains
C) Amino acids in proteins are mainly in the D-configuration
D) Twenty four amino acids are commonly used in protein synthesis

59. In ecosystem productivity is an important factor. Consider the following statements with reference to productivity: Which of the statements given below is/are correct?

1. Primary production is defined as the amount of biomass or organic matter produced per unit area over a time period by plants during photosynthesis.
2. The rate of biomass production is called productivity.
3. Net primary productivity of an ecosystem is the rate of production of organic matter during photosynthesis.
4. Secondary productivity is defined as the rate of formation of new organic matter by consumers.

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

60. Sequential and orderly predictable change in the species composition of a given area is known as -------.

A) Ecological succession B) Ecological niche
C) Ecological stabilization D) Ecological equivalence

61. Food chain represents nutrients and energy flow from organism to organism. With reference to food chain, consider the following statements:

1. Only 10 % of the energy is transferred to each trophic level from the lower trophic level.
2. The flow energy takes place in both directions in food chain.
3. The natural interconnection of food chains makes it a food web.

Which of the statements given above is/are correct?

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

62. The multilateral convention seeks to protect human health from the hazardous persistent organic pollutant is

A) Basel convention 1989 B) Bonn convention 1979
C) Rotterdam convention 1998 D) Stockholm convention 2001

63. Marine park preserve is a specific habitat and ensure the ecosystem is sustained for the organisms that exist there. Name the first National marine park

A) Mahatma Gandhi National marine park
B) Gulf of Kutch
C) Rani Jhansi
D) Gulf of Mannar

64. Which among the following are examples for critically endangered animals in the Indian Red Data Book the documentation of red listed species, has evolved to become the most comprehensive inventory of the global conservation status of biological species.

A) Indian vulture B) Spoon-billed sandpiper
C) White-rumped vulture D) all the above

65. The methodology of propagation methods of selected horticultural species by specialized pegging a branch in soil is known as

A) Grafting B) Layering
C) Cutting D) Vegetative propagation

66. Similar sized proteins in a mixture viz., A, B and C, the peptide A is positively charged, B is weakly negative and C is strongly negative. If this mixture is loaded and eluted through an ion-exchange chromatography column containing an anionic resin, their order of elution will be

A) A, B, C B) C, B, A
C) B, C, A D) A, B and C elute together

67. Match the category of RNA molecules in Group I with their roles in Group II.

Group I	**Group II**
a. snoRNA	1. Protects germ line from transposable elements
b. piRNA	2. Blocks translation of selected mRNA
c. miRNA	3. Template for telomere elongation
d. snRNA	4. Modification and processing of rRNA
	5. Splicing of RNA transcripts

A) a-3, b-5, c-2, d-4 B) a-1, b-3, c-2, d-5
C) a-1, b-4, c-5, d-2 D) a-4, b-1, c-2, d-5

68. Symptoms of Leaf spot of Mango are water-soaked, irregular, black lesions surrounded by chlorotic halos. Due to vein limitations, the spots become angular and result in cankerous, rough, necrotic, raised lesions. Name the causative of this disease.

A) *Xanthomonas campestris* B) *Pseudomonas cichorii*
C) *Erwinia carotovora* D) *Corynespora cassiicola*

69. Flavr Savr (CGN-89564-2), a genetically modified tomato, was the first commercially grown genetically engineered food granted a license for human consumption. It was produced by-----, and submitted to the U.S. Food and Drug Administration

A) Calgene B) Monsanto C) Eli Lilly D) MAHYCO

70. Consider the following pairs:

Personality	**Concept/Term**
1. Ernst Haeckel	Ecology
2. A.G. Tansley	Ecosystem
3. Elton	Ecological pyramids

Which of the above pairs are correctly matched?

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

71. Incorporation of gene of one species into the genetic background of another species by means of interspecific hybridization and backcrossing is known as

A) introgression B) polyploidy
C) mutation D) transformation

72. Resistance, induced by the exposure of root or foliar tissues to abiotic or biotic elicitors, is dependent of the phytohormone salicylate (salicylic acid), and associated with the accumulation of pathogenesis-related (PR) proteins is known as

A) Systemic acquired resistance
B) Induced systemic resistance
C) Systemic and induced resistance
D) Innate resistance

73. Which among the following substances will not evoke an immune system unless they are attached to a larger molecule?

A) Antigen B) Virus C) Hapten D) Miligen

74. The immune system has the ability to recognize self antigens versus nonself antigen which is an evolutionary pressure to assure:

A) Specific immunity B) Tolerance
C) Cell mediated immunity D) Antigenic immunity

75. Cyclin dependent kinases help in cell cycle regulation. The basic function of Cdk2/cyclin E is in

A) G_2/M transition B) G_2
C) M D) G_1/S transition

76. What is the characteristic feature of daughter cells and parent cells during G1 phase of cell cycle?

A) Daughter cells have half the amount of cytoplasm and half the amount of DNA.
B) Daughter cells have half the number of chromosomes and half the amount of DNA.
C) Daughter cells have the same number of chromosomes and half the amount of DNA.
D) Daughter cells have the same number of chromosomes and the same amount of DNA.

77. The nuclear envelope is seen intact in which among the group of eukaryotic organisms during mitosis?

A) seedless plants B) dinoflagellates
C) diatoms D) B and C only

78. G-protein coupled receptors are heptahelical protein receptors. Find out the correct statement about G-protein coupled receptors?

A) The N-terminal chain is extracellular and C-terminal chain is intracellular
B) It contains 5 trans-membrane hydrophobic sections
C) There are more extracellular loops than intracellular loops
D) The binding region for G-protein involves 2 extracellular loops

79. In DNA replication experiment by Meselson-Stahl, the bacterial cells were labeled with isotope of nitrogen. The bacteria were labeled across generations with ^{15} N, and followed by ^{14} N. What would be the percentage of the DNA with 1 light strand and 1 heavy strand after 2 generations of growth in ^{15} N growth media?

A) 0 B) 25 C) 50 D) 75

80. ------- is a part of an mRNA molecule that can directly bind a small target molecule, and whose binding of the target affects the gene's activity

A) Corepressor B) Enhancer C) Lac operon D) Riboswitch

81. The packaging of DNA is by specialized proteins called histones which help to generate coils and loops leading to higher levels of organizations. It involves the formation of linear array of spherical structures. The basic unit of DNA packaging, with an octamer of 4 histones complexes is called

A) endosome B) nucleosome C) mesosome D) centromere

82. Murray Barr discovered Barr body in a process called lyonization in species where sex is determined by the presence of Y chromosomes. So, a Barr body is

A) a gene on the X chromosome that is responsible for female development.
B) a patch of cells that has a phenotype different from surrounding cells because of variable X inactivation.
C) an inactivated X chromosome, visible in the nucleus of a cell from a female mammal.
D) an extra X chromosome in a cell that is the result of nondisjunction.

83. Chromosomal inversions cause change in orientation of DNA segment within a chromosome, which can bring about phenotypic changes in organisms. This phenomenon is best explained by

A) polyploidy B) genetic deletion
C) position effect D) aneuploidy

84. In bacteria, Luria and Delbruck's conducted Fluctuation test to distinguish between spontaneous versus adaptive mutation, which is an

A) evidence for spontaneous mutation
B) evidence for adaptive mutation
C) evidence that DNA is the genetic material
D) All of the above

85. Mutation causes changes in the codon of amino acids. The mutation that causes changes in multiple contiguous amino acid in proteins is due to……:

A) frame shift B) base analogue C) transversion D) transition

86. Identify the correct statement regarding the Bacterial ribosomes

A) are unable to synthesize proteins in the presence of tetracycline
B) are larger than eukaryotic ribosomes
C) contain the same forms of proteins as in eukaryotic ribosomes
D) have the same RNA contents as in eukaryotic ribosome

87. Puccinia are characterized by

1. Macrocyclic and heteroecious rust fungus. It produces uredia and telia stages on wheat plant. The spores produced on wheat are uredospores and teleutospores. Uredospores can re-infect wheat but teleutospores cannot do it. Instead they give rise to basidia.
2. Basidiospores infect barberry.
3. Pycnidia develop on the upper surface of barberry leaves. Dikaryotisation occurs. It gives rise to aecidial stage. Aecidia develop on the lower surface of barberry leaves. They form aecidiospores which infect Wheat.

A) 1 only B) 1 & 2 C) 1 & 3 D) All the above

88. Ergot of rye is caused by a species of

A) Uncinula B) Ustilago C) Claviceps D) Phytophthora

89. Dioecious plant species produce a separate male and a female plant. Analyze the following examples which display this feature

A) Yam B) Papaya C) Mulberry D) All the above

90. Chenopodiaceae, Portulacaceae, Aizoaceae, Cactaceae, Nyctaginaceae, Phytolaccaceae, Stegnospermaceae, Basellaceae, Amaranthaceae and Didieraceae, which have been placed under a single, order Centrospermae based on the chemotaxonomic marker ------.

A) Terpenoids B) Alkaloids C) Betalins D) Iridoid

91. Identify the root stem transition using the given features: Only phloem strands divide. Number of primary bundles in the roots is equal to that of stem. In such type, the xylem strands do not show forking. They continue their direct course into the stem, twisting through 180°. The phloem strands, however, divide and the two halves swing laterally to the position of the xylem. They join the xylem strands on the outer side. The number of primary bundles produced in the stem is equal to the number of phloem strands present in the root

A) Fumaria B) Lathyrus C) Cucurbita D) Anemarrhena

92. Syngenecious anthers are present in

A) Euphorbiaceae B) Polygalaceae
C) Asteraceae D) Dipterocarpaceae

93. Morphology of the useful part in Opium

A) Flower B) leaves
C) Unopened flower buds D) Fruit

94. Isogamy, Anisogamy and Oogamy are found in different species of

A) Nostoc B) Polysiphonia
C) Chlamydomonas D) Pinnularia

95. LSD is obtained from

A) *Claviceps purpurea* B) *Ganoderma lucidum*
C) *Cladonia viscosa* D) *Aspergillus flavus*

96. An anticancer drug obtained from Gymnosperm is

A) Ephedrin B) Taxol C) Turpentine D) Vincristein

97. Pollination in gymnosperms occurs by

A) birds B) insects C) bats D) wind

98. Sterigma is seen in -------

A) Peziza B) Phytophthora
C) Cercospora D) Pencillium

99. Commonly practiced artificial vegetative propagation in rubber

A) Cutting B) layering C) budding D) grafting

100. Maximum photosynthesis occurs in

A) Tropical rain forests B) Grass lands
C) Temperate forests D) Ocean

101. Which community is associated with 'Arogyapacha'?
A) Kurichya B) Kurumba C) Kani D) Kuruman

102. The concept of biodiversity hotspots are on the basis of
A) Endemism
B) Presence of living fossils
C) Endemic flowering plants and threat perception
D) Biodiversity richness only

103. A virus free clone from a virus infected plant can be made by
A) meristem tip culture B) layering
C) budding D) nodal cuttings

104. Washington convention is related with
A) IUCN
B) CITES
C) Botanical Garden Internationale
D) Hot spots

105. Most dangerous metal pollutant in automobile emission is
A) Iron B) Lead C) Mercury D) Cadmium

106. Which is the indicator of water contamination by human faecal matter?
A) Streptococcus B) E.coli C) Bacillus D) Sikka virus

107. The diversity of habitats over the total geographical area is
A) Alpha diversity B) Beta diversity
C) Gama diversity D) Delta diversity

108. Which among the following is a C4 plant?
A) corn B) cactus C) wheat D) rice

109. Find out the Zn requiring enzyme of glycolysis.
A) Hexokinase B) Phosphoglycerate mutase
C) Phosphofructokinase D) Aldolase

110. Which of the following elements plays an important role in nitrogen fixation?
A) Calcium B) Magnesium
C) Molybdenum D) Manganese

111. Which of the following is not connected with cytoplasmic inheritance?
A) Lack of Mendalian inheritance
B) Absence of linkage
C) Comb pattern in chicken
D) Drug resistance in Chlamydomonas

112. Which is not connected with Apoptosis?
A) Senescence of leaves
B) Formation of paws
C) Metamorphosis of tadpole into frog
D) Cell necrosis

113. Match the Group I with Group II:

Group I		**Group II**	
a.	NMR	1.	Alpha and beta particle detection
b.	Isoelectric focusing	2.	Lazer based technology
c.	Flow cytometry	3.	Protein separation
d.	Liquid scintillation	4.	Imaging

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

114. Which DNA polymerase is connected with mitochondrial DNA synthesis?
A) α (alpha) polymerase B) ε (epsilon) polymerase
C) γ-(gama) polymerase D) δ-(delta) polymerase

115. The DNA binding domain which is having repeats of cysteine and histidine residues is
A) Helix-turn-helix domain B) Leucine zipper domain
C) Zinc finger domain D) Helix-loop-helix domain

116. The active ingredient of *Roundup* is
A) Ethylene B) Glyphosate C) ABA D) Urea

117. Orcinol, the derivative for the dye Orcein is obtained from
A) Usnea B) Cladonia C) Peltigera D) Roccella

118. Which among the following is a micronutrient?
A) Calcium B) Sulphur C) Magnesium D) Molybdenum

119. Which among the following is a protein data base?
A) GEN BANK B) PIR C) DDBJ D) EMBL

120. The DNA and protein sequence alignment software package developed by David J Lipman and William R Pearson is
A) FASTA B) BLAST C) BioSCAN D) EMBOSS