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ROLL No.

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TEST BOOKLET No.

143

TEST FOR POST GRADUATE PROGRAMMES

BOTANY

Time: 2 Hours

Maximum Marks: 450

INSTRUCTIONS TO CANDIDATES

1. You are provided with a Test Booklet and an Optical Mark Reader (OMR) Answer Sheet to mark your responses. Do not soil the Answer Sheet. Read carefully all the instructions given on the Answer Sheet.
2. Write your Roll Number in the space provided on the top of **this page**.
3. Also write your Roll Number, Test Code, and Test Subject in the columns provided for the same on the **Answer Sheet**. Darken the appropriate bubbles with a **Ball Point Pen**.
4. The paper consists of 150 objective type questions. All questions carry equal marks.
5. Each question has four alternative responses marked **A, B, C** and **D** and you have to **darken** the bubble fully by a **Ball Point Pen** corresponding to the correct response as indicated in the example shown on the Answer Sheet.
6. Each correct answer carries **3** marks and each wrong answer carries **1** minus mark.
7. Please do your rough work only on the space provided for it at the end of this Test Booklet.
8. You should return the Answer Sheet to the Invigilator before you leave the examination hall. However, you can retain the Test Booklet.
9. Every precaution has been taken to avoid errors in the Test Booklet. In the event of such unforeseen happenings the same may be brought to the notice of the Observer/Chief Superintendent in writing. Suitable remedial measures will be taken at the time of evaluation, if necessary.

SEAL

BOTANY

1. Spiral shaped chloroplasts are present in
 - (A) *Spirogyra*
 - (B) *Oedogonium*
 - (C) *Ulothrix*
 - (D) *Ulva*

2. Molarity of pure water is
 - (A) 55.6
 - (B) 12.4
 - (C) 44.3
 - (D) 34.1

3. The bioluminescent dinoflagellates are
 - (A) *Noctiluca* and *Gonyaulax*
 - (B) *Gymnodinium* and *Cerastium*
 - (C) *Dinobryon* and *Distephanus*
 - (D) *Pinnularia* and *Acetabularia*

4. In an endergonic reaction, ΔG° is positive and the equilibrium constant is ...
 - (A) >1
 - (B) $=1$
 - (C) <1
 - (D) 0

5. An example of a hydrolase is
 - (A) Glutamate synthase
 - (B) Lactate dehydrogenase
 - (C) Glucose 6-phosphatase
 - (D) Nitrogenase

6. The high-efficiency particulate air (HEPA) filters used in laminar flow chambers can filter particles up to μm .
 - (A) 0.05
 - (B) 0.2
 - (C) 0.01
 - (D) 0.3

7. Which of the following is not a member of *Enterobacteriaceae*?
 - (A) *Serratia*
 - (B) *Shigella*
 - (C) *Klebsiella*
 - (D) *Stigmatella*

8. Ammonia oxidation to nitrate depends on the following two bacteria
- (A) *Nitrosomonas-Nitrospira* (B) *Azospirillum-Pseudomonas*
(C) *Nitrobacter-Nitrococcus* (D) *Nitrospira-Nitrococcus*
9. Ames test is used for
- (A) a special *Salmonella* strain to test chemicals for mutagenicity and potential carcinogenicity
(B) a *Streptococcus* strain to test its pathogenicity on humans
(C) a *Caulobacter* strain to test for use in the treatment of mutagens and carcinogens
(D) a *Helicobacter* strain to test for curing gut cancer
10. Pick up the key intermediate of the TCA cycle
- (A) Pyruvate (B) Succinate
(C) Shikimate (D) Lactate
11. Thermophiles have temperature optima between
- (A) 45-50°C (B) 55-65°C
(C) 70-85°C (D) 80-90°C
12. Which among the following is not a fluorescent probe?
- (A) Ethidium bromide (B) Dansyl chloride
(C) Fluorescein (D) Malachite green
13. During which phase of the growth of microorganisms, the number of dividing cells equal the number of resting cells?
- (A) Log (B) Lag
(C) Stationary (D) Death
14. Which among the following supports lithoautotrophic growth of microorganisms?
- (A) $H_2S + CO_2$ (B) $H_2S + \text{glucose}$
(C) $\text{Glucose} + CO_2$ (D) $CO_2 + H_2S$

15. Methylene blue is a/an
- (A) basic dye (B) acid dye
(C) neutral dye (D) both neutral and acid dye
16. Identify the mismatch
- (A) *Bifidobacterium* - produces acetic acid
(B) *Frankia* - fixes nitrogen
(C) *E. coli* - Methyl red positive
(D) *Enterobacter* - H₂S positive
17. Which of the following is not a member of the family, *Verbenaceae*?
- (A) *Lantana* (B) *Lippia*
(C) *Rotheca* (D) *Abutilon*
18. Microorganisms growing on very high nutrient are referred to as
- (A) oligotrophus (B) lithotrophs
(C) copiotrophus (D) autotrophs
19. Match the following (a, b, c, d) and select an appropriate matching set given below:
- | | |
|--------------|-------------------------|
| a. Cloves | 1. <i>Myristicaceae</i> |
| b. Cinnamon | 2. <i>Liliaceae</i> |
| c. Nutmeg | 3. <i>Asteraceae</i> |
| d. Echinacea | 4. <i>Lauraceae</i> |
| | 5. <i>Myrtaceae</i> |
| | 6. <i>Compositae</i> |
- (A) a-1, b-3, c-6, d-3 (B) a-6, b-2, c-5, d-1
(C) a-5, b-4, c-1, d-3 (D) a-3, b-5, c-2, d-6
20. India collaborated in the high throughput genome sequencing project of
- (A) Rice (B) Human
(C) Yeast (D) Cotton

21. Which of the following cannot be used for delivering foreign genes into higher plant cells?
- (A) Agrobacterium (B) Microprojectile
(C) Biolistics (D) Electrophoresis
22. Xenoparasites
- (A) are capable of invading an injured organism
(B) are adapted to a specific host
(C) spend their whole life cycle in/on an individual host
(D) need more than one host to complete their life cycle
23. In phytoremediation, plants are used
- (A) for medical applications
(B) as pollution indicators
(C) in the treatment of contaminated sites
(D) in the treatment of infected plants
24. Microorganisms have reactions that replenish cyclic intermediates so that the TCA cycle can continue to function when active biosynthesis is taking place. Reactions that replace cyclic intermediates are called
- (A) anapleurotic reactions (B) amphibolic reactions
(C) anaphylic reactions (D) amphiphilic reactions
25. Which among the following genera is not a primary producer?
- (A) *Chlorella* (B) *Rhodospirillum*
(C) *Rhodococcus* (D) *Spirulina*
26. Which of the following is an essential amino acid for humans?
- (A) Glutamic acid (B) Lysine
(C) Glycine (D) Serine
27. The precursor for fatty acid biosynthesis is
- (A) Histidine (B) Phenylalanine
(C) Malonyl CoA (D) Acetyl CoA



28. During the stationary phase of microbial growth
- (A) balance between cell division and cell death occur
 - (B) cell division is more than cell death
 - (C) cell death is more than cell division
 - (D) None of the above
29. A relationship in which the product of one organism has a negative effect on another organism is called
- (A) commensalism
 - (B) amensalism
 - (C) mutualism
 - (D) None of the above
30. *Escherichia coli* belongs to the class
- (A) Alphaproteobacteria
 - (B) Betaproteobacteria
 - (C) Gammaproteobacteria
 - (D) Deltaproteobacteria
31. The first plant to have its genome sequenced belongs to
- (A) Brassicaceae
 - (B) Solanaceae
 - (C) Compositae
 - (D) Fabaceae
32. "Geosmins" are
- (A) a group of antibiotics produced by Streptomycetes
 - (B) streptomycete metabolites that give characteristic earthy odour of soil
 - (C) polyenes produced by *Streptomyces*
 - (D) a group of *Streptomyces* which are useful for mining
33. An example of cold desert is
- (A) Sahara
 - (B) Gobi
 - (C) Thar
 - (D) Kulu
34. Pygmy weed is
- (A) *Azolla filiculoides*
 - (B) *Raphia farinifera*
 - (C) *Crassula erecta*
 - (D) *Alocasia macrorrhiza*

35. L, M, N and O are the enzymes of Kreb's cycle. Choose the correct pair of enzyme reactions that release CO_2 among L, M, N and O.
- L. Malate dehydrogenase
M. Succinate dehydrogenase
N. Isocitrate dehydrogenase
O. α -ketoglutarate dehydrogenase
- (A) L, M
(B) N, O
(C) L, O
(D) M, N
36. These are some of the important biomolecules. Identify their corresponding match:
- | | |
|---------------------------|-------------------------|
| a. Cytochrome P450 | 1. Thiol tripeptide |
| b. Ascorbic acid | 2. Superoxide dismutase |
| c. Glutathione | 3. Glycoprotein |
| d. H_2O_2 | 4. Antioxidant |
| | 5. Heme-protein complex |
| | 6. Glycolipid |
- (A) a-6, b-5, c-4, d-3
(B) a-2, b-3, c-1, d-4
(C) a-5, b-4, c-1, d-2
(D) a-5, b-3, c-6, d-2
37. Which of the following pairs is mismatched?
- (A) Metachromatic granules – stored phosphates
(B) Sulfur granules – energy reserve
(C) Lipid inclusions – poly β -hydroxybutyric acid
(D) Polysaccharide granules – stored starch
38. An enzyme present in all living systems
- (A) ALA-synthase
(B) RUDP-carboxylase
(C) Nitrogenase
(D) Tryptophan synthase
39. Which among the following heavy metals is not a plant nutrient?
- (A) Mg, Zn, Mo
(B) Pb, Cd, Hg
(C) Co, Fe, Mn
(D) Co, Al, Zn



40. Winogradsky column is used as an enrichment vehicle for the isolation of microorganisms
- (A) aerobic (B) anaerobic
(C) microaerobic (D) parasitic
41. With the problems of increasing carbon emissions, holds considerable promise
- (A) CO₂ precipitation using alkali
(B) CO₂ sequestration
(C) CO₂ adsorption using charcoal
(D) CO₂ agglutination
42. Identify the mismatched pair among the following:
- (A) Willow – cricket bat (B) Teak – furniture
(C) Givotia – toys (D) Jatropa – railway tracks
43. Microcosms refer to
- (A) DNA fragments of microorganisms
(B) a laboratory system that attempts to stimulate a natural habitat
(C) a system where microorganisms are grown in space
(D) small changes that occur in microorganisms due to toxic chemicals
44. Ametoeicious means
- (A) non-host specific (B) no host
(C) host-specific (D) non parasitic
45. Which one of the following is a root-inducing plasmid?
- (A) pBR 322 (B) Ti-plasmid
(C) Ri-plasmid (D) Phagemid
46. All the following are examples of lipids except
- (A) Phospholipids (B) Chitin
(C) Waxes (D) Cholesterol

47. Role of mycorrhiza is to increase
- (A) phosphorous availability (B) potash availability
(C) nitrogen availability (D) calcium availability
48. Which of the following common names does not match with its botanical name?
- (A) Okra - *Abelmoschus esculentus*
(B) Black pepper - *Piper betel*
(C) Pineapple - *Ananas comosus*
(D) Gooseberry - *Physalis peruviana*
49. In *Drosophila* (fruit flies), eye colour is sex-linked and red eye colour is dominant to white eye colour. Which of the following is not possible in a cross between a red-eyed male and a heterozygous female?
- (A) Red eyed male (B) White eyed male
(C) Carrier female (D) Homozygous white eyed females
50. Which of the following is not a member of the family Solanaceae?
- (A) *Atropa* (B) *Withania*
(C) *Hyoscyamus* (D) *Dracaena*
51. Classification based on genetic and evolutionary relationships among the taxa is called
- (A) artificial (B) natural
(C) phylogenetic (D) sexual
52. World Environment Day is observed on
- (A) 8th May (B) 5th June
(C) 13th August (D) 9th September
53. Smooth endoplasmic reticulum plays an important role in the synthesis of
- (A) proteins (B) lipids
(C) carbohydrates (D) DNA



54. Which among the following is considered as the smallest sized cell organelle?
- (A) Mitochondria (B) Chloroplasts
(C) Ribosomes (D) Golgi complex
55. When 20% of chiasma is formed between two loci, A and B among the tetrads of an individual of the genotype AB/ab, the percent of gametes expected to be 'AB' are
- (A) 5 (B) 10
(C) 20 (D) 40
56. The chemical which caused the Bhopal gas tragedy is
- (A) Methyl isocyanate (B) Diethyl isocyanate
(C) Methyl mercury (D) Ethyl-methyl mercury
57. What pigments occur in blue-green algae?
- (A) Phycocyanin and phycoerythrin
(B) Lycopene and rhodopin
(C) Spirilloxanthin and rhodopin
(D) Spheroidene and okeonone
58. Select the false matching
- (A) Sugarcane virus I – Virus (B) *Meloidogyne* – Nematode
(C) *Xanthomonas* – Bacterium (D) *Leptosphaeria* – Myxomycete
59. "Bordeaux mixture" is composed of
- (A) sulphur and lime (B) copper sulphate and lime
(C) ammonia and sulphur (D) ammonia and copper sulphate
60. In which of the following plants spikelets are present?
- (A) *Triticum aestivum* (B) *Solanum torvum*
(C) *Allium cepa* (D) *Delonix regia*



61. Match the following combinations and select the correct option from codes given below:

- I. Endemic - incidence periodical and in wide areas
- II. Epidemic - constantly occurring disease from year to year in moderate to severe form
- III. Epiphytotic - incidence periodical and environmental condition dependent
- IV. Sporadic - incidence irregular and in lesser areas

- (A) I and II are correct
- (B) I, II and III are correct
- (C) III and IV are correct
- (D) All are correct

62. Any suspected organism is finally accepted as the cause of a specific disease when it fulfils certain criteria formulated by Koch. Koch's postulates are:

- I. the organism must be consistently associated with the disease in question
- II. the organism must be isolated from diseased plant in pure culture
- III. the organism of pure culture must be capable of mutation
- IV. the organism of pure culture when inoculated back into healthy plant, must be capable of reproducing the symptoms of the disease

- (A) I and II are correct
- (B) I, II and III are correct
- (C) I, II and IV are correct
- (D) All are correct

63. Which of the following is an example of monosomy in human beings?

- (A) 46, XX
- (B) 46, XY
- (C) 46, XO
- (D) 45, XO

64. What is primarily found in transfusion tissue?

- (A) Sclerenchyma
- (B) Vessel members
- (C) Collenchyma
- (D) Tracheids

65. What is prominently absent in a monocot vascular bundle?

- (A) Metaxylem
- (B) Cambium
- (C) Protoxylem lacuna
- (D) Metaphloem



66. Identify the mismatch
- (A) *Dracaena* – *Liliaceae* (B) *Physalis* – *Solanaceae*
(C) *Derris* – *Fabaceae* (D) *Sida* – *Asteraceae*
67. Match the following
- | | |
|--------------------------------|-------------------|
| a. Pyramid of energy | 1. inverted |
| b. Pyramid of biomass in pond | 2. always upright |
| c. Flow of energy in ecosystem | 3. nitrogen |
| d. Biogeochemical cycle | 4. unidirectional |
- (A) a-2, b-1, c-4, d-3 (B) a-1, b-4, c-3, d-2
(C) a-3, b-2, c-1, d-4 (D) a-4, b-3, c-2, d-1
68. A bicollateral vascular bundle
- (A) is represented by fusion of two vascular bundles
(B) has phloem on both sides of the xylem
(C) has only one layer of xylem and of phloem
(D) has xylem on both sides of phloem
69. What single information would most help in predicting genotypic frequencies of the progeny resulting from a cross?
- (A) The parental gametes
(B) The number of chromosomes
(C) The frequency of the various possible parental phenotypes
(D) The allelic relationship, i.e., dominance, incomplete dominance and co-dominance
70. Conductive elements in Pteridophytes and Gymnosperms are
- (A) vessels (B) xylem parenchyma
(C) tracheids (D) xylem fibres

71. Which functional part of the ecosystem gets directly affected when we remove the Detriovers and Phytoplanktons from an ecosystem?
- (A) Biogeochemical cycling and secondary productivity
 (B) Eutrophication and primary productivity
 (C) Primary productivity and biogeochemical cycling
 (D) Biogeochemical cycling and primary productivity
72. Choose the correct statement from those given below:
- (A) Stalk holding the whole inflorescence – Rachis
 (B) Stalk of each single flower – Pedicel
 (C) Main stem holding the flowers or more branches within the inflorescence – Peduncle
 (D) All of the above
73. Thick, leathery exocarp, mesocarp and juicy, pulpy endocarp with axile placentation are the characteristic features of
- (A) berry (B) hesperidium
 (C) pome (D) etario of berries
74. Match the following:
- | | |
|-------------------|------------------|
| a. Hydathodes | 1. Phloem |
| b. Xylem | 2. Xylem rays |
| c. Ray parenchyma | 3. Water stomata |
| d. Leptome | 4. Hydrome |
- (A) a-3, b-4, c-2, d-1 (B) a-2, b-3, c-1, d-4
 (C) a-1, b-4, c-3, d-2 (D) a-4, b-1, c-2, d-3
75. Sutton and Boveri postulated the chromosome theory of inheritance in 1902. According to this theory
- (A) homologous chromosomes undergo pairing during meiosis
 (B) crossing over occurs between homologous chromosomes and results in new gene combinations
 (C) genes exist at definite loci in a linear sequence on chromosomes
 (D) chromosomes from both parents always have identical alleles



76. Physiological xerophytes is
- (A) *rhizophora* (B) *hydrilla*
(C) *opantia* (D) *neerium*
77. Light independent reactions of photosynthesis occurs in
- (A) Outer membrane (B) Stroma
(C) Granum (D) inner membrane
78. Bryophytes are
- (A) atracheophytic cryptogams
(B) tracheophytic amphibious cryptogams
(C) tracheophytic cryptogams
(D) atracheophytic amphibious cryptogams
79. Which of the following is an incorrect match?
- (A) Winged fruit –Samara
(B) Petaloid bracts- Mussanda
(C) Winged petiole- Citrus
(D) Tendrillar midrib- Climatis
80. Which of the following statements is false?
- (A) Food chains are inter-connected in an ecosystem
(B) Energy is completely utilized from one trophic level to another
(C) Oligotrophic lakes are mainly found in temperate climates
(D) Algal blooms leads to eutrophication
81. Common lesions found in DNA after exposure to UV light are
- (A) single strand breaks (B) purine dimers
(C) pyrimidine dimers (D) base deletions
82. Light reactions of photosynthesis are
- (A) oxidative (B) group transfer
(C) reductive (D) oxido-reductive



83. Which of the following is incorrect about C₄ plants?
- (A) Presence of Kranz anatomy
 - (B) Calvin cycle occurs in bundle sheath cells
 - (C) Primary CO₂ acceptor is Ribulose-5-phosphate
 - (D) Common in monocot families
84. Which of the following is true?
- (A) Cells in angular collenchyma are with thickened corners and intercellular spaces
 - (B) Cells in lacunar collenchyma are without intercellular spaces and thickened corners
 - (C) Cells in lamellar collenchyma are thickened radial walls than tangential walls
 - (D) None of the above
85. Which of the following is not correct?
- (A) Parenchyma is a living ground tissue
 - (B) Collenchyma is a living mechanical tissue
 - (C) Sclerenchyma is a dead mechanical tissue
 - (D) None of the above
86. Both X-linked genes and extranuclear inheritance produce different results in reciprocal crosses. How can we distinguish them?
- (A) Extranuclear traits can be transmitted from an unaffected mother to an affected son
 - (B) Extranuclear traits can be transmitted from an affected mother to an affected offspring
 - (C) Extranuclear traits cannot be transmitted from father to son
 - (D) None of the above
87. Photorespiration is high in which of the following?
- (A) C₄ plants
 - (B) CAM plants
 - (C) C₃ plants
 - (D) C₃-C₄ intermediates



88. Which of the following is correct?
- (A) Mitochondria are single membrane bound organelle
 - (B) Mitochondria are double membrane organelle
 - (C) Mitochondria do not have inter membrane space
 - (D) Non of the above
89. Which one of the following statements is incorrect?
- (A) Water potential of pure water is zero
 - (B) Water moves from higher to lower water potential
 - (C) Water potential is independent of solute concentration
 - (D) Water potential is responsible for water movements in plants
90. Which of the following is absent in Pteridophytes and Gymnosperms?
- (A) Companion cells
 - (B) Sieve cells
 - (C) Tracheids
 - (D) All of the above
91. In a species with $2n = 24$, the chromosome number at the end of first and second meiotic divisions would be
- (A) 12 and 12
 - (B) 24 and 12
 - (C) 24 and 24
 - (D) 12 and 24
92. Hormone which prevents precocious germination of seeds is
- (A) Auxin
 - (B) Ethylene
 - (C) ABA
 - (D) Gibberellin
93. Starch is a polymer of
- (A) α 1-4 linked glucose
 - (B) β 1-4 linked fructose
 - (C) β 1-4 glucose
 - (D) α 1-4 linked fructose
94. Hormone which is responsible for seed germination of barley is
- (A) ABA
 - (B) Gibberellin3
 - (C) Auxin and cytokinin
 - (D) Ethylene



95. Which of the following is incorrect about endosperm?
- (A) It is a post-fertilization product in angiosperms
 - (B) It is a pre-fertilization product and diploid gymnosperms
 - (C) It is triploid in angiosperms
 - (D) It is a nutritive tissue
96. When a cross is made between two individuals heterozygous for three pairs of genes, the number of genotypes and phenotypes that would be obtained in F_2 are (assuming dominance)
- (A) 9 and 4, respectively
 - (B) 4 and 16, respectively
 - (C) 16 and 4, respectively
 - (D) 27 and 8, respectively
97. Which of the following is an incorrect match?
- (A) Bryophytes – gametes are mitotic in origin
 - (B) Pteridophytes – gametes are meiotic in origin
 - (C) Protonema-diploid
 - (D) Zygosporangium-diploid
98. The evidence that DNA is the genetic material came from the experiments of
- (A) Morgan
 - (B) Griffith
 - (C) Watson and Crick
 - (D) Avery, MacLeod and McCarty
99. Which of the following endotoxin in *Bacillus thuringiensis* shows insecticidal activity?
- (A) Delta
 - (B) Alpha
 - (C) Beta
 - (D) Gamma
100. Glyphosate is a
- (A) fertilizer
 - (B) antibiotic
 - (C) herbicide
 - (D) hormone
101. The method of transfer of DNA by applying voltage is called
- (A) electroporation
 - (B) Electrotransfer
 - (C) artificial competence
 - (D) biolistics



102. Which of the following hormone is produced by *Agrobacterium* during crown gall formation?
- (A) Abscissic acid (B) Gibberellic acid
(C) Ethylene (D) Cytokinins
103. Which of the following is the recognition site of *Eco RI*?
- (A) 5'GGATCC (B) 5'GAATTC
3'CCTAGG 3'CTTAAG
(C) 5'GATC (D) 5'GGCC
3'CTAG 3'CCGG
104. The section of the plant material under microscope shows prominent protoxylem lacunae, Y-shaped xylem vessels which are characteristic features of
- (A) monocot root (B) dicot stem
(C) monocot leaf (D) monocot stem
105. Which one of the following is a secondary metabolite?
- (A) DNA (B) Amino acids
(C) Antibiotics (D) Sugars
106. Which of the following organisms is employed in the production of acetone, butanol, ethanol (ABE process)?
- (A) *Bacillus sp.* (B) *Clostridium sp.*
(C) *Aspergillus sp.* (D) *E. coli*
107. Match the following:
- | | |
|--------------|------------------------|
| a. anthrax | 1. monoclonal antibody |
| b. rabies | 2. hormone |
| c. hepatitis | 3. <i>Bacillus sp.</i> |
| d. humulin | 4. zoonotic disease |
| e. Abzyme | 5. recombinant vaccine |
- (A) a-3, b-4, c-5, d-2, e-1 (B) a-5, b-4, c-3, d-2, e-1
(C) a-1, b-3, c-4, d-5, e-2 (D) a-2, b-1, c-5, d-3, e-4



108. In *Drosophila melanogaster*, the expected sex of individuals with the genotype 2X 3A is
- (A) intersex (B) male
(C) female (D) triploid female
109. Gymnosperms with vessels
- (A) *Pinus* (B) *Cycas*
(C) *Gnetum* (D) *Selaginella*
110. Which of the following is an incorrect match?
- (A) Yellow-green Algae - *Acetabularia*
(B) Red Algae - *Porphyra*
(C) Brown Algae - *Ectocarpus*
(D) Green Algae - *Chlamydomona*
111. Nucleolar organizer contains the genes for
- (A) mRNA (B) rRNA
(C) tRNA (D) All of the above
112. The genotype of an individual that shows the dominant phenotype can be determined by crossing it with an individual that is
- (A) heterozygous recessive (B) homozygous recessive
(C) heterozygous dominant (D) homozygous dominant
113. Match list I (a, b, c, d) with list II (1, 2, 3, 4) and select the correct option from the codes given below:
- | List I – disease | List II – pathogens |
|------------------------------|------------------------------|
| a. White rust of crucifers | 1. <i>Claviceps purpurea</i> |
| b. Powdery mildew of cereals | 2. <i>Albugo candida</i> |
| c. Downy mildew of pea | 3. <i>Erysiphe graminis</i> |
| d. Ergot of grains | 4. <i>Peronospor pisi</i> |
- (A) a-2, b-3, c-4, d-1 (B) a-2, b-4, c-3, d-1
(C) a-1, b-2, c-4, d-3 (D) a-4, b-3, c-2, d-1

114. Identify the mismatch among the medicinal plants and their principal chemical constitution
- (A) *Datura metal* – scopolamine
 - (B) *Asparagus racemosus* – saponin
 - (C) *Papaver somniferum* – morphine
 - (D) *Digitalis lannata* – atropine
115. Match the cell organelles (a, b, c, d) with their enzymes present (1, 2, 3, 4, 5)
- | | |
|------------------|------------------------|
| a. Chloroplast | 1. Catalase |
| b. Mitochondrion | 2. Protease |
| c. Lysosome | 3. GAP-dehydrogenase |
| d. Ribosome | 4. Peptidyltransferase |
| | 5. Malic dehydrogenase |
- (A) a-3, b-5, c-2, d-4 (B) a-1, b-4, c-3, d-2
(C) a-3, b-5, c-1, d-2 (D) a-4, b-1, c-5, d-3
116. Chloroplasts occur in mesophyll cells as well as in the roots of
- (A) *Taeniophyllum sp.*
 - (B) *Solanum tuberosum*
 - (C) *Iimnophila sp.*
 - (D) *Trapa sp.*
117. Identify the mismatch
- (A) Parenchyma cells of potato – Anyloplasts
 - (B) Pericarp of unripe tomato – Chloroplasts
 - (C) Pericarp of ripe capsicum – Chromoplasts
 - (D) Chromoplasts of phaeophyceae – Phycoerythrin
118. Genes having more than one distinct phenotypic effect are called
- (A) multiple genes
 - (B) pleiotropic genes
 - (C) pseudogenes
 - (D) multiple alleles
119. A diploid organism can have the following members of a series of multiple alleles
- (A) 1
 - (B) 2
 - (C) 3
 - (D) 4



120. Choose the incorrect match from the following
- (A) Pearl millet – *Poaceae* (B) Chick pea – *Fabaceae*
(C) Coconut – *Areaceae* (D) Neem – *Malvaceae*
121. Pick the correct order of useful part for the following
1. *Emblica officinalis* 2. *Gingiber officinalis* 3. *Tectona garndis* 4. *Aloe vera*
- (A) 1) fruit, 2) rhizome, 3) wood, 4) leaf
(B) 1) rhizome, 2) fruit, 3) leaf, 4) wood
(C) 1) wood, 2) rhizome, 3) leaf, 4) fruit
(D) 1) leaf, 2) rhizome, 3) fruit, 4) wood
122. Which of the following is true?
- (A) *Pterocarpus santalinus* is called Indian rose wood
(B) Wood used for musical instruments is *Dalbergia*
(C) *Tectona grandis* is called Indian sandal wood
(D) Redwood is used in cricket bat manufacture
123. Chlorophyll c, d, and e are found only in
- (A) algae (B) bryophytes
(C) fungi (D) None of the above
124. The reserve food material in endosperm of maize grain is
- (A) glucose (B) glycogen
(C) starch (D) None of the above
125. Bacterial endospores are rich in
- (A) picolinic acid and calcium (B) dipicolinic acid and calcium
(C) picolinic acid and iron (D) dipicolinic acid and iron
126. Which of the following microbe is a symbiotic nitrogen fixer?
- (A) *Pseudomonas aerogunosa* (B) *Acetobacter sp.*
(C) *Rhizobium melilotii* (D) *Rhizoctonia solanii*

127. Commensalism is
- (A) a type of symbiosis in which one individual gains from the association and the other is neither harmed nor benefited
 - (B) a type of symbiosis in which one individual gains from the association by harming the other
 - (C) a type of symbiosis in which both the individuals gain from each other and are not harmed
 - (D) a type of symbiosis in which both the individuals gain from each other but finally harm each other
128. The wood of which one of the following trees is mostly used for making cricket bats?
- (A) Banyan
 - (B) Teak
 - (C) Willow
 - (D) Casuarinas
129. Energy crops are
- (A) sugarcane, sugar beet, potato and tomato
 - (B) sugarcane, tapioca and cauliflower
 - (C) sugarcane, potato and tapioca
 - (D) millets, banana and tomato
130. Which one of the following is the most volatile compound?
- (A) C_2H_5OH
 - (B) $C_2H_5OC_2H_5$
 - (C) CH_3COOH
 - (D) CH_3OH
131. The sequence of reactions leading to the conversion of glucose to pyruvate is called
- (A) Kreb's cycle
 - (B) Glycolysis
 - (C) C_3 pathway
 - (D) Gluconeogenesis
132. Which of the following is incorrect about the glycolysis?
- (A) Occurs in cytoplasm
 - (B) Substrate level phosphorylation
 - (C) Requires oxygen
 - (D) Produces NADH



133. The gametophytic stage in Angiosperms is
- (A) microspore (B) megaspore mother cell
(C) egg cell (D) microspore and egg cell
134. Pick the incorrect match from the following
- (A) Agar-agar - Gelidium
(B) Soups and salads - *Ulva lactuca*
(C) Single cell protein - Spirulina
(D) Edible mushroom - *Amanita phalloides*
135. Abundant protein on planet Earth is
- (A) collagen (B) keratin
(C) RUBISCO (D) albumin
136. A common symptom in plants due to deficiency of P, K, Ca and Mg is
- (A) formation of anthocyanins
(B) bending of the leaf top
(C) poor vasculature
(D) development of necrotic areas
137. Trees have a large amount of
- (A) starch (B) cellulose
(C) lignocellulose (D) chitin
138. Tryptophan is the precursor for the biosynthesis of
- (A) auxin (B) gibberlin
(C) cytokinin (D) abscissic acid
139. Endospores are
- (A) certain fungal spores, enable their species to survive in adverse conditions
(B) certain bacterial spores, enable them to survive in adverse conditions
(C) certain protozoan fruiting bodies, enable them to survive in adverse conditions
(D) non-living viral capsules, capable of infecting eukaryotic cells

140. In SDS-PAGE, polypeptides are separated on the basis of
- (A) charge (B) structure
(C) size (D) size/charge
141. Sea weeds are an important source of
- (A) iodine (B) gelatin
(C) starch (D) potassium
142. Sexual reproduction is absent in which of the group of fungi mentioned below?
- (A) *Ascomycetes* (B) *Besidomycetes*
(C) *Deuteromycetes* (D) All of the above
143. *Gnetum* is a
- (A) tree (B) climber
(C) shrub (D) creeper
144. How many types of cell division are there in plant cells?
- (A) 1 (B) 2
(C) 3 (D) 4
145. Penicillin is commercially obtained from
- (A) *Penicillium divaricatum* (B) *Penicillium chrysogenum*
(C) *Penicillium notatum* (D) *Penicillium expansum*
146. Duckweeds belong to the family of
- (A) *Fabaceae* (B) *Amaranthaceae*
(C) *Lemnaceae* (D) *Asteraceae*
147. Cloves belong to the family of
- (A) *Myrtaceae* (B) *Fabaceae*
(C) *Palmaceae* (D) *Malvaceae*

148. Serpentine is extracted from *Rauwolfia serpentine*. Chemically, serpentine is a/an
- (A) terpene (B) carbohydrate
(C) alkaloid (D) steroid
149. The largest flowering plant *Rafflesia* is a/an
- (A) symbiotic (B) epiphytic
(C) free living (D) parasitic
150. A reddish blue-green alga that occasionally grows in great abundance, impacts a red colour to the sea is called
- (A) *Trichodesmium erythraeum* (B) *Synechocystis* sp. PCC6803
(C) *Nostoc punctiforme* (D) *Prochlorococcus* sp.
