

Code No.

T – 2116

**Entrance Examination for Admission to the P.G. Courses in the
Teaching Departments, 2024**

CSS

BOTANY WITH SPECIALIZATION IN BIODIVERSITY CONSERVATION

General Instructions

1. The Question Paper is having 100 Objective Questions, each carrying one mark.
2. The answers are to be (✓) 'tick marked' **only** in the "**Response Sheet**" provided.
3. **Negative marking** : **0.25 marks** will be deducted for each wrong answer .

Time : 2 Hours

Max. Marks : 100

To be filled in by the Candidate									
Register Number	in Figures								
	in words								

Choose appropriate answer from the options in the questions.

(100 × 1 = 100 marks)

1. The mitochondrial electron transport chain carriers are located
 - A. in the inner mitochondrial membrane
 - B. in the mitochondrial matrix
 - C. in the inter-membrane space
 - D. on the inner surface of the outer mitochondrial membrane

DO NOT WRITE HERE

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2. The two Principle products of photosynthesis are:
- A. Starch and Sucrose
 - B. Glycerol and Glycogen
 - C. Cellulose and Glycogen
 - D. Glycerol and Cellulose
3. Which of the following statements is true about the Krebs (citric acid) cycle and the Calvin (light independent) cycle?
- A. They both result in a net production of ATP and NADH
 - B. They both result in a release of oxygen
 - C. They both are carried out by enzymes located within an organelle matrix
 - D. They both take place within the cytoplasmic matrix

11. This is a blue light receptor
- A. Phytochrome
 - B. Cytochrome
 - C. Cryptochrome
 - D. Ferrochrome
12. Where is the storage site of triacylglycerols synthesized in plants?
- A. Oleosomes
 - B. Vacuoles
 - C. Mitochondria
 - D. Chloroplast
13. Paclobutrazol is an inhibitor of the synthesis of following hormone.
- A. Cytokinin
 - B. Auxin
 - C. GA
 - D. Ethylene
14. In lichens that have both green algal and cyanobacterial symbionts, the cyanobacteria are restricted to structures called:
- A. Cephalodia
 - B. Isidia
 - C. Soredia
 - D. Soralia
15. An organism that uses glucose as a source of both energy and carbon is called:
- A. Photoautotroph
 - B. Photoheterotroph
 - C. Chemoautotroph
 - D. Chemoheterotroph
16. Which of the following vitamin is a precursor of coenzyme A?
- A. Folic acid
 - B. Riboflavin
 - C. Pantothenic acid
 - D. Niacin
17. What is the physiological function of statoliths?
- A. Photoreception
 - B. Signalling
 - C. Gravity sensing
 - D. Senescence

18. A condition in which a single mutant gene affects two or more distinct and seemingly unrelated traits:
- A. Promoter mutation
 - B. Epistasis
 - C. Phenotypic variance
 - D. Pleiotropy
19. Transport of proteins into mitochondria is through:
- A. F_0 and F_1 Complexes
 - B. Tom and Tim Complexes
 - C. GERL Complexes
 - D. Toc and Tic Complexes
20. Ames test is a test for:
- A. Coliforms
 - B. Carbohydrates
 - C. Mutagenicity
 - D. Lipids
21. Which of the following is an illegitimate name?
- A. Superfluous name
 - B. Later homonyms
 - C. Tautonyms
 - D. All the above
22. The function of amphigastria is:
- A. Absorption of water
 - B. Storage of water
 - C. Protection from microorganisms
 - D. Protection from insects
23. Coffee rust is caused by:
- A. *Puccinia graminis*
 - B. *Cephaleuros coffeae*
 - C. *Helminthosporium coffeae*
 - D. *Hemileia vastatrix*
24. If the chromosome number in the leaf of *Funaria* is 20, what will be the chromosome number in the spores?
- A. 20
 - B. 40
 - C. 10
 - D. 5

32. The antenna complex found in photosynthetic bacteria are:
- A. Chondrosome
 - B. Chlorosome
 - C. Chromatosome
 - D. Chromatophore
33. In which of the following families does pseudo embryo sac is present?
- A. Podostemaceae
 - B. Amaranthaceae
 - C. Malvaceae
 - D. Poaceae
34. Single letter code of tryptophan
- A. W
 - B. F
 - C. Y
 - D. Z
35. Which one of the following terms describes the increase in the performance of a cross when two different inbred lines are crossed?
- A. Heterozygotic
 - B. Heterosis
 - C. Heterogametic
 - D. Homogametic
36. Balloon like outgrowths seen in secondary xylem vessel is
- A. Tyloses
 - B. Tylosoid
 - C. Casparian thickening
 - D. Periderm
37. What is the difference between a threatened species and an endangered species?
- A. A threatened species means that the population is likely to become endangered; an endangered species has population numbers so low that it is likely to become extinct
 - B. A threatened species is already extinct; an endangered species means that the population numbers have increased greatly over the last 5 years
 - C. A threatened species means that the population is likely to become endangered; an endangered species is already extinct
 - D. A threatened species and an endangered species are the same thing

38. Which among the following is not a nucleic acid database?
A. EMBL
B. GenBank
C. DDBJ
D. SWISS-PROT
39. Red rust is caused by:
A. *Puccinia*
B. *Cephaleuros*
C. *Batrachospermum*
D. *Colletotrichum*
40. Which of the following is diploid in moss plant?
A. Spore
B. Leaves
C. Spore mother cell
D. Gametes
41. Linen is obtained from:
A. Flax
B. Hemp
C. Sisal
D. Manila hemp
42. A cross in which the sexes of the parents are the reverse of another cross:
A. Reciprocal cross
B. Backcross
C. Test cross
D. Dihybrid cross
43. The androecium of family Asteraceae is
A. Syngenesious
B. Polyadelphous
C. Synandrous
D. Monoadelphous
44. The term "Genetic load" refers to:
A. The aggregate of deleterious genes that are carried in the genome of a population
B. Reduction in vigour and fertility in plant species
C. Increased vigour and size of inter-specific hybrids
D. Increased homozygosity in the plant progeny

45. Heterocysts are cells specialised for:
- A. Photosynthesis
 - B. Nitrogen fixation
 - C. Food storage
 - D. Reproduction
46. In protoplast fusion which one of the following compounds is used?
- A. Sorbitol
 - B. Polyethylene glycol
 - C. Dinitrophenol
 - D. Mannitol
47. Which one of the following is devoid of nucleus?
- A. Sieve tube element
 - B. Guard cell of stomata
 - C. Collenchyma cell
 - D. Companion cell
48. Gene flow is a concept best used to describe an exchange between
- A. Individuals
 - B. Chromosomes
 - C. Species
 - D. Populations
49. Which one of the following genera shows vessels in xylem?
- A. *Cycas*
 - B. *Pinus*
 - C. *Gnetum*
 - D. *Araucaria*
50. Which one of the following is the first known fossil vascular plant?
- A. *Cooksonia*
 - B. *Zosterophyllum*
 - C. *Rhynia*
 - D. *Williamsonia*
51. BLAST is used:
- A. To find similarity between sequences
 - B. To align sequences
 - C. To design primers
 - D. To amplify DNA

52. The layer below the topmost layer in a thermally stratified lake is called
- A. Epilimnion
 - B. Hypolimnion
 - C. Littoral zone
 - D. Profundal zone
53. The most lethal ultra violet radiation is
- A. UV-A
 - B. UV-B
 - C. UV-C
 - D. UV-D
54. The free energy of a dissolved solute
- A. increases with solute concentration
 - B. decreases with solute concentration
 - C. is independent of solute concentration
 - D. depends only on temperature
55. Both halophytes and glycophytes compartmentalize cytotoxic ions into the intracellular compartment or actively pump them out of the cell to the apoplasts with the help of membrane transport proteins. Among these, the $\text{Na}^+\text{-H}^+$ antiporter, NHX1, is localized in the
- 1. plasma membrane
 - 2. chloroplast (inner envelope)
 - 3. mitochondria (outer membrane)
 - 4. tonoplast
- A. 1 & 2 is correct
 - B. 1 & 3 is correct
 - C. 1 & 4 is correct
 - D. 2 & 4 is correct
56. Following is not a photoreceptor in plants
- A. Cryptochrome
 - B. Phytochrome
 - C. Phototropins
 - D. Xanthochrome

62. Which one of the following Event indicates the establishment of seed habit in Pteridophytes?
- Germination and development of microspores within megasporangium
 - Development of two types of spores in the same sporangium
 - Germination of megaspore, fertilization and development of embryo to some extent within megasporangium
 - Germination and development of microspores within microsporangium
63. Which one of the following pairs is not correctly matched?
- Interferon- an enzyme that interfere with DNA replication
 - Cosmid - a vector for carrying large DNA fragments into host cells
 - Anticodon- site of t-RNA molecule hydrogen bond that binds to m-RNA molecule
 - Plasmid - small piece of extra-chromosomal DNA in bacteria
64. Pick up a site-specific nuclease involved in T-DNA transfer during *Agrobacterium tumefaciens* mediated genetic transformation:
- VirE2
 - VirD1
 - VirA
 - VirG
65. In C3 and C4 plants, primary carboxylation takes place with the help of
- PEP carboxylase and pyruvate carboxylase
 - RuBP carboxylase and PEP carboxylase
 - PEP carboxylase and RuBP carboxylase
 - RuBP carboxylase and pyruvate carboxylase
66. Peroxisomes are involved in which type reactions pertaining to plant photosynthesis
- Calvin Cycle
 - Glycolytic cycle
 - Glyoxylate cycle
 - Bacterial photosynthesis

67. The fundamental feature of Kranz Anatomy of C4 plants is
- A. Presence of typical granal chloroplasts in bundle sheath cells and rudimentary chloroplasts in mesophyll cells
 - B. Presence of rudimentary chloroplasts in bundle sheath cells and typical granal chloroplasts in mesophyll cells
 - C. Presence of chloroplasts in epidermal and mesophyll cells
 - D. Presence of chloroplasts in bundle sheath cells
68. The statement which is incorrect with respect to enzyme action is
- A. Addition of lot of Succinate does not reverse the inhibition of succinic dehydrogenase by malonate
 - B. The substrate binds with enzyme as its active site
 - C. A non-competitive inhibitor binds the enzyme at a site distinct from that which binds the substrate
 - D. Malonate is a competitive inhibitor of succinic dehydrogenase
69. A phosphoglyceride is always composed of
- A. Only an unsaturated fatty acid esterified to a glycerol molecule to which a phosphate group is also attached
 - B. Only a saturated fatty acid esterified to a glycerol molecule to which a phosphate group is also attached
 - C. An unsaturated or saturated fatty acid esterified to a phosphate molecule to which a glycerol molecule is also attached
 - D. An unsaturated or saturated fatty acid esterified to a glycerol molecule to which a phosphate group is also attached
70. When *Datura* plants have been regenerated from anther culture, endosperm culture and embryo culture under in vitro conditions, their respective ploidy levels will be:
- A. $2n$, $3n$ and $2n$
 - B. $2n$, $2n$ and $2n$
 - C. n , $2n$ and $2n$
 - D. n , $3n$ and $2n$

71. Which of the following is not a post translational modification?
- A. Proteolysis
 - B. Protein folding
 - C. Glycosylation
 - D. Lipid addition
72. The introns in mRNA are removed as
- A. Lariat structure
 - B. Circular structure
 - C. Linear structure
 - D. Stem loop structure
73. The kind of association where both the population are benefitted, but not essential for the survival of either population is referred to as:
- A. Protocooperation
 - B. Competition
 - C. Amensalism
 - D. Exploitation
74. Which of the following statements about the oxidative decarboxylation of pyruvate is correct?
- A. The oxidative decarboxylation of pyruvate forms acetyl-CoA which is fed into the citric acid cycle
 - B. The oxidative decarboxylation of pyruvate is reversible since there is a large decrease of free energy in the reaction
 - C. The oxidative decarboxylation of pyruvate formed in aerobic glycolysis occurs in the cytosol
 - D. The oxidative decarboxylation of pyruvate is catalysed by the enzyme pyruvate Decarboxylase
75. The 3' prime end of the t-RNA molecule that picks up specific amino acid during translation, always ends in base sequence
- A. CGA
 - B. GCA
 - C. CCA
 - D. ACC

82. Rice variety IR-8 was developed in:

- A. India
- B. China
- C. Philippines
- D. Malaysia

83. Which of the following statements regarding photosynthesis are correct?

1. Photosystem I is activated by light independently from photosystem II
2. Plastocyanin reduces photo oxidised P700 in PSI
3. Plastocyanin reduces photo oxidised P680 in PSI
4. Electrons ejected from P700 in photosystem I are replaced with electrons from water

Which of the following combination is correct?

- A. 1, 2 and 4
- B. 2, 3 and 4
- C. 1, 2 and 3
- D. 3 and 4

84. In an enzyme catalysed reaction, a non-competitive inhibitor cause

- A. Decrease of V_{max}
- B. Decrease of both K_m and V_{max}
- C. Increase of K_m
- D. Decrease of K_m and increase of V_{max}

85. Pick out the correct statements.

1. Ethylene is especially useful in enhancing seed germination
2. Cytokinin receptor is located in ER membrane
3. Quercetin is the natural inhibitor of ABA.
4. GA controls flowering by mimicking vernalization.

- A. 2, 3 and 4
- B. 1, 3 and 4
- C. 2 and 4
- D. 3 and 4

90. *Agrobacterium* based gene transfer is efficient,
- A. Only with monocots
 - B. Only with dicots
 - C. With both monocots and dicots
 - D. With majority monocots and few dicots
91. Silicula fruits are common in the family
- A. Apiaceae
 - B. Annonaceae
 - C. Anacardiaceae
 - D. Brassicaceae
92. An enzyme that catalyses the transfer of phosphate groups from high-energy, phosphate-donating molecules to specific substrates.
- A. Kinase
 - B. Phosphatase
 - C. Peptidase
 - D. Peptidyl transferase
93. The final seral stage of succession is climax community, it is
- A. Is self-sustaining
 - B. Show growth proceeding in a predictable pattern
 - C. Is never changing
 - D. Is not likely to be disturbed by localized climatic change
94. Plant with white squash (WWYY) is crossed with plant with green squash (wwyy). On testing F1 and F2 progenies were obtained in the following ratio
12 white: 3 yellow: 1 green
Which of the following statement is correct?
- A. Duplicate dominant epistasis; W is epistatic gene
 - B. Dominant epistasis; W is epistatic gene
 - C. Duplicate dominant epistasis; Y is epistatic gene
 - D. Dominant epistasis; Y is epistatic gene

95. One dimensional Polyacrylamide gel electrophoresis in the absence of SDS (native gel electrophoresis) resolves proteins based on their mass and
- A. Charge
 - B. Hydrodynamic volume
 - C. Secondary structure
 - D. Hydrophobicity
96. Why do glycolipids exist almost exclusively on the exterior side, but not the cytoplasmic side of the cell membrane?
- A. The inner layer of the membrane is not thick enough to accommodate carbohydrates
 - B. Carbohydrates are added only to lipids on the lumen side of the ER and golgi membranes
 - C. Flippases move the glycolipids to this side of the membrane
 - D. Carbohydrates are removed from the cytoplasmic side by glycosylase enzymes
97. Which of the following statement are correct?
- i. Down's syndrome/mongolism is due to extra 21st chromosome
 - ii. Down's syndrome is due to non-disjunction of chromosomes
 - iii. Trisomy has chromosome complement of $2n+1$
 - iv. Monosomics are $2n-1$
- A. i and ii
 - B. iii and iv
 - C. i, ii and iii
 - D. i, ii, iii and iv

ANSWER SHEET

1	A	B	C	D	E	26	A	B	C	D	E	51	A	B	C	D	E	76	A	B	C	D	E
2	A	B	C	D	E	27	A	B	C	D	E	52	A	B	C	D	E	77	A	B	C	D	E
3	A	B	C	D	E	28	A	B	C	D	E	53	A	B	C	D	E	78	A	B	C	D	E
4	A	B	C	D	E	29	A	B	C	D	E	54	A	B	C	D	E	79	A	B	C	D	E
5	A	B	C	D	E	30	A	B	C	D	E	55	A	B	C	D	E	80	A	B	C	D	E
6	A	B	C	D	E	31	A	B	C	D	E	56	A	B	C	D	E	81	A	B	C	D	E
7	A	B	C	D	E	32	A	B	C	D	E	57	A	B	C	D	E	82	A	B	C	D	E
8	A	B	C	D	E	33	A	B	C	D	E	58	A	B	C	D	E	83	A	B	C	D	E
9	A	B	C	D	E	34	A	B	C	D	E	59	A	B	C	D	E	84	A	B	C	D	E
10	A	B	C	D	E	35	A	B	C	D	E	60	A	B	C	D	E	85	A	B	C	D	E
11	A	B	C	D	E	36	A	B	C	D	E	61	A	B	C	D	E	86	A	B	C	D	E
12	A	B	C	D	E	37	A	B	C	D	E	62	A	B	C	D	E	87	A	B	C	D	E
13	A	B	C	D	E	38	A	B	C	D	E	63	A	B	C	D	E	88	A	B	C	D	E
14	A	B	C	D	E	39	A	B	C	D	E	64	A	B	C	D	E	89	A	B	C	D	E
15	A	B	C	D	E	40	A	B	C	D	E	65	A	B	C	D	E	90	A	B	C	D	E
16	A	B	C	D	E	41	A	B	C	D	E	66	A	B	C	D	E	91	A	B	C	D	E
17	A	B	C	D	E	42	A	B	C	D	E	67	A	B	C	D	E	92	A	B	C	D	E
18	A	B	C	D	E	43	A	B	C	D	E	68	A	B	C	D	E	93	A	B	C	D	E
19	A	B	C	D	E	44	A	B	C	D	E	69	A	B	C	D	E	94	A	B	C	D	E
20	A	B	C	D	E	45	A	B	C	D	E	70	A	B	C	D	E	95	A	B	C	D	E
21	A	B	C	D	E	46	A	B	C	D	E	71	A	B	C	D	E	96	A	B	C	D	E
22	A	B	C	D	E	47	A	B	C	D	E	72	A	B	C	D	E	97	A	B	C	D	E
23	A	B	C	D	E	48	A	B	C	D	E	73	A	B	C	D	E	98	A	B	C	D	E
24	A	B	C	D	E	49	A	B	C	D	E	74	A	B	C	D	E	99	A	B	C	D	E
25	A	B	C	D	E	50	A	B	C	D	E	75	A	B	C	D	E	100	A	B	C	D	E

ROUGH WORK

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