

**C.S.E BOTANY - 2005**  
**(PRELIMINARY)**

*Time Allowed: 2 hours*

*Maximum Marks: 300*

- 1. Restriction enzymes cut DNA at specific sites known as**
  - (a) Telomeric sequences
  - (b) Palindromic sequences
  - (c) Terminator sequences
  - (d) Attenuator sequences
- 2. Calcium dependent kinases can control**
  - (a) Cell cycle activities
  - (b) DNA replication
  - (c) Cell surface receptors
  - (d) Membrane structure
- 3. The proteins that reproduce within the living cells are termed as**
  - (a) Plasmids
  - (b) Phages
  - (c) Prions
  - (d) Prophages
- 4. Which one of the following is involved in self-splicing of introns in *Tetrahymena thermophile*?**
  - (a) Primase
  - (b) Ribozyme
  - (c) Reverse transcriptase
  - (d) RNA polymerase
- 5. Which one of the following plasmid vectors was constructed by combining centomere, telomere and autonomously replicating sequence?**
  - (a) pBR 322
  - (b) Cosmid
  - (c) Yeast Artificial Chromosome (pYAC)
  - (d) Bacterial Artificial Chromosome (BAC)
- 6. Which one of the following increases the frequency of *Agrobacterium* mediated genetic transformation?**
  - (a) ASGorbic acid
  - (b) Acetosyringone
  - (c) Aflatoxin
  - (d) Abscisic acid
- 7. The most commonly used method of choice for gene transfer using immature embryos as explants is**
  - (a) Microprojectile
  - (b) Electroporation
  - (c) Liposome mediated
  - (d) Chemically stimulated
- 8. A pericentric inversion in chromosome involves**
  - (a) One arm of a chromosome
  - (b) Both the arms of a chromosome
  - (c) Two different chromosomes
  - (d) More than two chromosomes
- 9. A red or orange dye used in dyeing silks is obtained from the pulp that surrounds the seeds of**
  - (a) *Semecarpus anacardium*
  - (b) *Embllica officinalis*.
  - (c) *Bixa orellana*
  - (d) *Aegle marmelos*
- 10. Development of embryo from gametophute without the intervention of the gamete is known as**
  - (a) Apospory
  - (b) Apogamy
  - (c) Apomixis
  - (d) Aposporogamy
- 11. The most common ionising radiation used for mutation in plant improvement programme is**

- (a) X-rays (b) UV-rays  
(c) Gama-rays (d) Protons

**12. Who of the following made the first successful genetic transformation?**

- (a) Boyer and Cohen (b) H. Smith  
(c) Nirenberg and Khorana (d) S.B. Weiss

**13. Which one of the following is not a thermo stable enzyme?**

- (a) Taq DNA polymerase (b) RNA polymerase  
(c) Pfu DNA polymerase (d) Vent polymerase

**14. Microtubules are cylindrical structures having  $\alpha$  and  $\beta$  tubulin proteins. They are the constituents of which one of the following groups?**

- (a) Nucleus, Nucleolus, Nucleoid, Nuclear membrane  
(b) Centromere, Spindle fibres, Flagella, Cilia  
(c) Mitochondria, Lysosome, Chloroplast, Golgi apparatus  
(d) Chromosome, Chromo centre, Chromatid, Chromatin

**15. With reference to the inhibition of protein synthesis by antibiotics, consider the following statements :**

1. Chloramphenicol blocks initiation of transcription in prokaryotes.
2. Rifamycin inhibits the elongation of polypeptide chain in prokaryotes.

Which of the statements given above is/are correct?

- (a) 1 only (b) 2 only  
(c) Both 1 and 2 (d) Neither 1 nor 2

**16. Consider the following statements:**

1. Transfer RNA contains a number of rare bases that are not found in other nucleic acids.
2. During translation, the frame shift errors many times result in the synthesis of very useful proteins.

Which of the statements given above is/are correct?

- (a) 1 only (b) 2 only  
(c) Both 1 and 2 (d) Neither 1 nor 2

**17. Consider the following statements:**

1. The eukaryotic mRNAs are metabolically more stable than the prokaryotic mRNAs.
2. The mRNAs of most prokaryotes are polycistronic, but the mRNAs of eukaryotes are monocistronic.

Which of the statements given above is/are correct?

- (a) 1 only (b) 2 only  
(c) Both 1 and 2 (d) Neither 1 nor 2

**18. Consider the following statements:**

In the phenomenon of photoperiodic induction to flowering,

1. the sites of perception for night length are young leaves.
2. the sites of response i.e., apical meristem, must be illuminated for flowering to take place.

Which of the statements given above is/are correct?

- (a) I only (b) 2 only  
(c) Both 1 and 2 (d) Neither 1 nor 2

**19. Consider the following statements:**

1. The seed of pea is albuminous.
2. The fruit of peach is drupe.

Which of the statements given above is/are correct?

- (a) 1 only (b) 2 only  
(c) Both I and 2 (d) Neither 1 nor 2

**20. Match List I (Disease) with List II (Causal Organism) and select the correct answer using the code given below the lists:**

List I

- |                           |                            |
|---------------------------|----------------------------|
| A. Blast disease of rice  | 1. Ustilago nuda           |
| B. Loose smut of wheat    | 2. Xanthomonas malvacearum |
| C. Black arm of cotton    | 3. Ustilago scitaminae     |
| D. Whip smut of sugarcane | 4. Pyricularia oryzae      |

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

**21. Consider the following:**

1. *Bacillus subtilis*
2. *Trichoderma viride*
3. *Erysiphe graminis*
4. *Septoria glycines*

Which of the above antagonistic organisms is/are capable of suppressing plant disease?

- (a) 1 and 2 (b) 2 and 3  
(c) 2, 3 and 4 (d) 1 only

**22. Which one of the following statements is not correct?**

- (a) The bunt of rice is found only in southern India.
- (b) The pathogen of the stem rot of rice belongs to Deuteromycetes.
- (c) The blast disease of rice affects the crop in all stages
- (d) In the brown spot disease of rice all parts of the plant are infected except roots.

**23. Consider the following statements:**

1. *Trichoderma harzianum* secretes cell wall lysing enzymes.
2. *Bacillus penatrans* is used to kill the nematode *Meloidogyne* sp.

Which of the statements given above is/are correct ?

- (a) 1 only (b) 2 only  
(c) Both 1 and 2 (d) Neither 1 nor 2

**24. Consider the following statements:**

1. *Anabaena* lives symbiotically with *Azolla*
2. *Azotobacter* is a free - living organism in the soil.

Which of the statements given above is/are correct?

- (a) 1 only. (b) 2 only  
(c) Both 1 and 2 (d) Neither 1 nor 2

**25. Consider the following fungi:**

1. *Arthrotrrys oligospora*
2. *Dactylella cionopaga*
3. *Streptomyces rimosus*

Which of these are predaceous for the biological control of nematodes in soil ?

- (a) 1 and 2 (b) 1 and 3  
(c) 2 and 3 (d) 1, 2 and 3

**26. Consider the following statements:**

1. The Indian Board of Wildlife is headed by the Prime Minister
2. As per the latest 'State of Forest Report', the total forest cover in India is over 20% of the geographical area of the country.

Which of the statements given above is/are correct?

- (a) 1 only (b) 2 only  
(c) Both 1 and 2 (d) Neither 1 nor 2

**27. Consider the following statements:**

1. Most mitochondrial proteins are encoded by nuclear chromosomal DNA.
2. UGA, a stop-codon for nuclear DNA is read as tryptophan in mitochondria.

Which of the statements given above is/are correct?

- (a) 1 only (b) 2 only  
(c) Both 1 and 2 (d) Neither I nor 2

**28. Match List I (*Institute*) with List II (*Location*) and select the correct answer using the code given below the lists:**

List I				List II					
A.	B.	C.	D.	1.	2.	3.	4.		
Central Tabacoo Research Institute	Central Soil Salinity Research Institute	Central Potato Research Institute	Indian Grassland and Fodder Research Institute	Shimla	Jhansi	Kamal	Rajahmundry		
				5.					
				Guntur					
	A	B	C	D	A	B	C	D	
(a)	4	I	2	3	(b)	4	3	I	2
(c)	5	3	I	2	(d)	5	1	2	3

**29. The Aggregate Fruit of lotus consists of fruitlets which are an aggregate of**

- (a) Achenes (b) Berries  
(c) Drupes (d) Follicles

Consider the following statements:

1. *Agrobacterium tumefaciens* is a soil bacterium.
2. *Agrobacterium tumefaciens* was the first vector used for introduction of foreign DNA in plant cells.

Which of the statements given above is/are correct?

- (a) 1 only (b) 2 only

- (c) Both 1 and 2 (d) Neither 1 nor 2
- 31. In numerical taxonomy, the taxonom'ic entity of the lowest rank used is**  
(a) Operational taxonomic unit (b) Individual  
(c) Lines (d) Taxon
- 32. Elaters are absent in**  
(a) *Funaria* (b) *Marchantia*  
(c) *Pe/Jia* (d) *Porella*
- 33. Salicornia is an example of**  
(a) Epiphyte (b) Halophyte  
(c) Mesophyte (d) Parasite
- 34. An outgrowth of the funiculus near its top is known as**  
(a) Aril (b) Baculum  
(c) Caruncle (d) Epiblast
- 35. Which one of the following gymnosperms reproduces both vegetatively as well as sexually?**  
(a) Cycas (b) Cedrus  
(c) Ephedra (d) Pinus
- 36. Conspicuous sporophyte with indeterminate growth is a characteristic feature of**  
(a) Bryophyta (b) Tracheophyta  
(c) Chlorophyta (d) Rhodophyta
- 37. Which one of the following structures is not found in any class of algae?**  
(a) Rhizoid and apical cell (b) Apical cell  
(c) Embryo (d) Thalloid plant body
- 38. Consider the following statements:**  
*Marchantia polymorpha*  
1. is dioecious.  
2. possesses antheridiophores and archegoniophores.  
3. lacks foot and seta in its sporophyte  
4. is heterosporous.  
Which of these statements are correct?  
(a) 1 and 2 (b) 3 and 4  
(c) 1 and 4 (d) 2 and 3
- 39. Which one of the following species is used for the extraction of Geranium oil?**  
(a) *Cymba pagan flexuosus*  
(b) *Pelargonium groveolens*  
(c) *Rosa damascena*  
(d) *Schleichera trijuga*
- 40. Which one of the following is a rod-shaped bacterium?**  
(a) *Bacillus subtilis*  
(b) *Pneumococcus pneumoniae*  
(c) *Streptococcus nigricans*

(d) *Vibrio cholera*

41. In the gametophytic type of self - incompatibility, which of the following crosses would *not* be compatible?

- (a)  $S_1S_3 \times S_1S_4$  (b)  $S_1S_4 \times S_2S_3$   
(c)  $S_1S_3 \times S_1S_3$  (d)  $S_2S_4 \times S_1S_4$

42. The objective of bud pollination, in which mature pollen is applied to immature non-receptive stigms generally 1 to 3 days prior to anthesis, is to

- (a) Hasten the maturity of pollinated stigma  
(b) Increase the viability period of pollen applied  
(c) Promote cross-pollination between related species  
(d) Overcome self-incompatibility

43. Consider the following with reference to sporophytic (SSI) or gametophytic (GSI) self-incompatibility systems:

1. SSI - 3 celled pollen, rejection reaction on the stigma.
2. GSI - 2 celled pollen, rejection reaction in the style. SSI - 2 celled pollen, rejection reaction in the style.
3. GSI - 3 celled pollen, rejection reaction on the stigma.

Which of these features are correct in the case of sporophytic or gametophytic self - incompatibility systems?

- (a) 1 and 2 (b) 2 and 3  
(c) 2 and 4 (d) 3 and 4

44. Seed dormancy can be broken by exposure to red light in

- (a) Lettuce (b) Pea  
(c) Tomato (d) Onion

45. Which one of the following phytohormones is known to contribute to bud dormancy?

- (a) Ethylene (b) Coumarin  
(c) Cytokinin (d) ABA

46. In cereals, which one of the following kinds of leaves plays a key role in the supply of photosynthates to the developing grain?

- (a) Young leaves (b) Mature leaves  
(c) Flag leaves (d) Scale leaves

47. Perisperm is a post-fertilization modification of

- (a) Nucellus (b) Outer integument  
(c) Central cell (d) Inner integument

48. Which one of the following pairs is correctly matched?

- (a) Pistia Sciophyte  
(b) Lemna Xerophyte  
(c) Rhizophora Halophyte  
(d) Casuarina Hydophyte

49. Match List I (Mangrove) with List II (State) and select the correct answer using the code given below the lists:

List I

List II

- A. Bhitarkanika
- B. Coondapur
- C. Pichavaram
- D. Vembanad

- |     | A | B | C | D |
|-----|---|---|---|---|
| (a) | 3 | I | 4 | 2 |
| (c) | 2 | 4 | 1 | 3 |

- 1. Karnataka
- 2. Kerala
- 3. Orissa
- 4. Tamilnadu

- |     | A | B | C | D |
|-----|---|---|---|---|
| (a) | 3 | 4 | 1 | 2 |
| (d) | 2 | 1 | 4 | 3 |

50. Which one of the is a fatty acid polyester?

- (a) Agar
- (b) Lignin
- (c) Pectin
- (d) Suberin

51. Consider the following statements:

- 1. Bacterial DNA is not bound by histones.
- 2. Cycloheximide inhibits protein synthesis in bacteria.

Which of the statements given above is/are correct ?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

52. Match List I (Plant) with List II (Family) and select the correct answer using the code given below the Lists:

- List I
- A. Coffee
  - B. Chocolate
  - C. Opium
  - D. Vanilla

- |     | A | B | C | D |
|-----|---|---|---|---|
| (a) | 1 | 4 | 2 | 3 |
| (c) | 3 | 2 | 4 | 1 |

- List II
- 1. Orchidaceae
  - 2. Papavaraceae
  - 3. Rubiaceae
  - 4. Sterculiaceae

- |     | A | B | C | D |
|-----|---|---|---|---|
| (b) | 1 | 2 | 4 | 3 |
| (d) | 3 | 4 | 2 | 1 |

53. The maturation of anthers and stigmas at times in the same flower is known as

- (a) Herkogamy
- (b) Cleistogamy
- (c) Chasmogamy
- (d) Dichogamy

54. In photorespiration, RuBP carboxylase combines with oxygen to yield

- (a) Two molecules of phosphoglycerate
- (b) Two molecules of phosphoglycolate
- (c) One molecule of phosphoglycerate and one molecule of phosphoglycolate
- (d) Two molecules of glucose

55. Match List I (Colloquial Name) with List H (Plant) and select the correct answer using the code given below the Lists:

- List I
- A. Adder's tongues
  - B. Horse tails
  - C. Club moss
  - D. Bog moss

- List II
- 1. Lycopodium
  - 2. Sphagnum
  - 3. Ophioglossum
  - 4. Equisetum

	A	B	C	D
(a)	3	4	1	2
(c)	2	1	4	3

	A	B	C	D
(b)	3	1	4	2
(d)	2	4	1	3

**Directions:** The following six (6) items consist of two statement, one labeled as 'Assertion (A)' and the other as 'Reason (R)'. You are to examine these two statements carefully and select the answers to these items using the code given below:

- (a) Both A and R are individually true and R is the correct explanation of A
  - (b) Both A and R are individually true and R is *not* the correct explanation of A
  - (c) A is true but R is false
  - (d) A is false but R is true Assertion
- 56. Assertion (A):** Tissues removed from crown gall tumours can be grown in culture without the addition of auxin and cytokinin.  
**Reason (R):** The bacterial plasmid contains the genes for the synthesis of plant auxin and cytokinin.
- 57. Assertion (A):** Lateral buds close to the shoot apex remain dormant while those some distance below the apical meristem develop into shoots.  
**Reason (R):** Apical shoot meristems and young leaves are the centres of IAA synthesis.
- 58. Assertion (A):** Some plant species grow poorly in nature if the soil fungi are killed with a fungicide.  
**Reason (R):** The mycorrhizal fungi transport nitrate into the plant and receive phosphate in return.
- 59. Assertion (A):** New characters are evolved in homogenous population due to organism-environmental interaction.  
**Reason (R):** Homogenous populations are prone to genetic mutations.
- 60. Assertion (A):** Folding and rolling movements in certain grasses are caused by the loss of turgor in bulliform cells.  
**Reason (R):** Bulliform cells are found in the horizontal rows in the leaf epidermis.
- 61. Assertion (A):** Self-incompatibility is not an absolute phenomenon.  
**Reason (R):** Even highly self-incompatible species can be self-pollinated by one stratagem or another.
- 62. Which one of the following correctly represents 'Homoplastic' condition?**
- (a) Similar characters of two or more taxa resulting from convergent or parallel evolution.
  - (b) Descent of two or more taxa from a recent common ancestor.
  - (c) Similar characters observed in different individuals of the same population.
  - (d) Development of different organs from the undifferentiated callus during the course of somatic tissue culture
- 63. The evolution of cultivated cotton is an example of**
- (a) Distant hybridization and polyploidy
  - (b) Diploidization of sterile F<sub>1</sub>
  - (c) Intergeneric hybridization and polyploidy



- (d) Interspecific hybridization and polyploidy
- 64. The spontaneous mutations in nature are mostly**
- (a) Recessive and lethal
  - (b) Dominant and beneficial
  - (c) Dominant and lethal
  - (d) Recessive and beneficial
- 65. When individuals of  $F_1$  progeny backcross with either of the parents than by mating with each other, the process is called**
- (a) Interprogeny hybridization
  - (b) Interpopulation hybridization
  - (c) Introgressive hybridization
  - (d) Sympatric hybridization
- 66. Periderm includes**
- (a) Phelloderm, collenchyma and cortex
  - (b) Phellem, cambium and cortex
  - (c) All the tissues between epidermis and pith
  - (d) Phellogen, phellem and phelloderm
- 67. Automaticilly typified names of suborders end in**
- (a) -ales
  - (b) -ineae
  - (c) -oideae
  - (d) -eae
- 68. A transitional form between tracheid and libriform fibre is termed as**
- (a) Bast fibre
  - (b) Septate fibre
  - (c) Fibre-sclereid
  - (d) Fibre-tracheid
- 69. Vertically elongated cells in the lateral meristem producing axial system in the secondary xylem and pholem are known as**
- (a) Fusiform initials
  - (b) Cambiform cells
  - (c) Phellogen cells
  - (d) Ray initials
- 70. Consider the following:**
- 1. Hydathodes
  - 2. Salt glands
  - 3. Nectaries
  - 4. Lenticels
- Which of these are secretory structures?
- (a) 1, 2 and 4
  - (b) 3 and 4
  - (c) 1, 2 and 3
  - (d) 1, 2, 3 and 4
- 71. The family in which members show transition from superior to inferior ovary is**
- (a) Asteraceae
  - (b) Commelinaceae
  - (c) Papilionaceae
  - (d) Rosaceae
- 72. In the root apex, that meristem from which the root cap develops independently of all other initials of the apical meristem is known as**
- (a) Calyptrogen
  - (b) Casparian strip
  - (c) Columella
  - (d) Corpus

**73. Consider the following statements:**

Nomenclature for a taxon is necessary because

1. vernacular names are not universal.
2. two or more unrelated species are known by the same common name.
3. vernacular names do not provide information on generic relationship.
4. vernacular names are not available for all the species. Which of these statements are correct?

- (a) I and 2 (b) 3 and 4  
(c) I, 2 and 3 (d) 1, 2, 3 and 4

**74. The taxonomic category 'Class' is between**

- (a) Order and Family (b) Order and Genus  
(c) Kingdom and Phylum (d) Division and Order

**75. When the generic name and the specific epithet, in a binomial have exactly the same spelling, the binomial is known as**

- (a) Autonym (b) Basionym  
(c) Synonym (d) Tautonym

**76. Besides Orchidaceae, pollinia are also found in**

- (a) Asclepiadaceae (b) Bignoniaceae  
(c) Poaceae (d) Scrophulariaceae

**77. The most primitive type of stamens are found in**

- (a) Degeneria (b) Lilium  
(c) Papaver (d) Solanum

**78. Match List I (Stain with List II (Cellular Part) and select the correct answer using the code given below the lists:**

List I				List II					
A. Toluidine blue				1. Fats					
B. Safranin				2. Lignin					
C. Cotton blue				3. RNA					
D. Osmium tetroxide				4. Fungal hyphae					
	A	B	C	D		A	B	C	D
(a)	I	2	4	3	(b)	3	2	4	1
(c)	3	4	2	1	(d)	1	4	2	3

**79. Which one of the following tracer elements can be incorporated in both DNA and RNA?**

- (a)  $^{14}\text{C}$  - Guanine (b)  $^{14}\text{C}$  - Uracil  
(c)  $^3\text{H}$  - Cytosine (d)  $^3\text{H}$  - Thymidine

**80. Which one of the following pairs is *not* correctly matched?**

Name of plant	Part used in vegetative reproduction
(a) Adiantum caudatum:	Sub-aerial root
(b) Chrysanthemum:	Sub-aerial stem
(c) Pineapple:	Reproduction bud at the end of inflorescence
(d) Kalanchoe:	Adventitious buds from the leaf

- 81. The fixation of CO<sub>2</sub> to malate and its decarboxylation are common to both C<sub>4</sub> and CAM plants, but in CAM plants these events**
- (a) Are separated spatially
  - (b) Are separated temporally
  - (c) Require high light intensity
  - (d) Require high CO<sub>2</sub> concentration
- 82. What is the primary acceptor of CO<sub>2</sub> in Hatch-Slack cycle?**
- (a) Phosphoenol pyruvic acid
  - (b) Ribulose biphosphate
  - (c) Phosphoglyceric acid
  - (d) Diphosphoglyceric acid
- 83. Which one of the following pairs is *not* correctly matched?**
- | Drug           | Part of the plant giving the drug |
|----------------|-----------------------------------|
| (a) Colchicin: | Bulb                              |
| (b) Digitoxin: | Leaves                            |
| (c) Ephedrin:  | Entire plant                      |
| (d) Cocaine:   | Roots                             |
- 84. A universal hydrogen acceptor in an electron transport system is**
- (a) ATP
  - (b) UDP
  - (c) NAD
  - (d) FMN
- 85. Consider the following:**
1. Succinic dehydrogenase
  2. Aconitase
  3. alpha-ketoglutarate dehydrogenase
  4. Isocitric dehydrogenase
- What is the correct order in which the above enzymes catalyse the reactions in Kreb's cycle?
- (a) I - 2 - J - 4
  - (b) 2 - 4 - I - 3
  - (c) 3 - 2 - 4 - I
  - (d) 2 - 4 - 3 - I
- 86. Consider the following enzymes:**
1. Glutamate dehydrogenase
  2. Glutamine synthetase
  3. Glutamate synthase
- Which of these are concerned with ammonia assimilation?
- (a) 1 and 2
  - (b) 2 and 3
  - (c) 1 and 3
  - (d) 1, 2 and 3
- 87. In all the nitrogen-fixers, the enzyme nitrogenase, that helps in the transfer of electrons from NADH to N=N, is located inside a thick protective covering because this protective covering**
- (a) Regulates the supply of oxygen
  - (b) Provides an anaerobic atmosphere protecting the enzyme from oxidation
  - (c) Acts as an oxygen scavenger

(d) Regulates the supply of sugars for anaerobic oxidation

**88. Consider the following organisms:**

1. Clostridium pasteurianum
2. Klebsiella pneumoniae
3. Thiobacillus ferrooxidans

Which of the above are free living nitrogen fixing organisms?

- (a) 1 and 2 (b) 2 and 3  
(c) 1 and 3 (d) 1, 2 and 3

**89. The increases respiration rate due specifically to anion uptake is called**

- (a) Salt respiration (b) Active absorption  
(c) Exchange absorption (d) Ground respiration

**90. Match List I (Scientist) with List II (Isotope Used,) and select the correct answer using the code given below the lists:**

List I				List II					
A.	Calvin			1.	180				
B.	Ruben and Kamen			2.	32p				
C.	Volkin and Astrachan			3.	14C				
D.	Meselson and Stahl			4.	15 N				
	A	B	C	D					
(a)	3	2	I	4	(b)	4	I	2	3
(c)	4	2	I	3	(d)	3	I	2	4

**91. Which one of the following pairs is *not* matched?**

- (a) Copper: Plastocyanin  
(b) Sulphur: Serine  
(c) Molybdenum: Nitrate reductase  
(d) Zinc: Alcohol dehydrogenase

**92. Addition of KCN reduces the rate of water absorption in the root. This indicates that water absorption is a/an**

- (a) Passive process  
(b) Energy dependent process  
(c) Osmotic difference, dependent process  
(d) Exchange diffusion process

**93. Consider the following events involved in stomatal opening:**

1. Turgor pressure of guard cells increases.
2. K<sup>+</sup> ions move into guard cells.
3. pH of guard cells decreases.
4. Water moves into guard cells.

What is the correct sequence of these events leading to stomatal opening:

- (a) 2 - 4 - 3 - I (b) 3 - 2 - 4 - I  
(c) 2 - 3 - 4 - I (d) 3 - I - 2 - 4

**94. Match List I (Life form) with List II (Means of Surviving the Stress) and select the correct answer using the code given below the lists:**

List I

- A Chamaephytes
- B. Geophytes
- C. Hemicryptophytes
- D. Therophytes

List II

- 1. Buds are underground on rhizomes, bulbs, corms
- 2. Buds are located at the surface of soil, protected by leaf and stem bases
- 3. Annual life span; survive the stress as seeds
- 4. Buds are located above ground, but low enough not to be exposed to strong winds

- |     | A | B | C | D |
|-----|---|---|---|---|
| (a) | 3 | 2 | I | 4 |
| (c) | 4 | I | 2 | 3 |

- |     | A | B | C | D |
|-----|---|---|---|---|
| (b) | 3 | 1 | 2 | 4 |
| (d) | 4 | 2 | I | 3 |

**95. Which one of the following is popularly associated with the name of Justus Liebig?**

- (a) Law of the Minimum
- (b) Law of Tolerance
- (c) Ecological Niche
- (d) Speciation

**96. Which one of the following ecological pyramids is always upright?**

- (a) Pyramid of numbers
- (b) Pyramid of biomass
- (c) Pyramid of energy
- (d) Age pyramid of plant populations

**97. The oil of which one of the following plants is edible and rich in poly unsaturated fatty acids?**

- (a) Aleurites fordii
- (b) Cocos nucifera
- (c) Carthamus tinctorius
- (d) Ricinus communis

**98. Match List I (Plant) with List II (Use) and select the correct answer using the code given below the lists:**

List I

- A Annas cosmosus
- B. Dolichos biflorus
- C. Elaeis guinensis
- D. Manihot glaziovii

List II

- 1. Fibre
- 2. Oil
- 3. Pulse
- 4. Rubber

- |     | A | B | C | D |
|-----|---|---|---|---|
| (a) | 1 | 2 | 3 | 4 |
| (c) | 4 | 3 | 2 | 1 |

- |     | A | B | C | D |
|-----|---|---|---|---|
| (b) | 1 | 3 | 2 | 4 |
| (d) | 4 | 2 | 3 | 1 |

**99. Which one of the following is used for pulp bleaching in the paper industry ?**

- (a) Mild sulphuric acid
- (b) Glucose isomerase
- (c) Chlorofluorocarbon
- (d) Chlorine and water

**100. Somaclonal variation can be advantageous because**

- (a) There are chromosomal abnormalities
- (b) Monosomics are produced
- (c) Enrichment of genetic diversity occurs

(d) It gives high genetic uniformity

**101. Consider the following statements :**

1. The first living organisms on planet Earth originated in water.
2. When life originated on planet Earth, the atmosphere contained nitrogen, ammonia, ozone, hydrogen, carbon dioxide, methane and water vapour.

Which of the statements given above is/are correct?

- (a) 1 only (b) 2 only  
(c) Both 1 and 2 (d) Neither 1 nor 2

**102. In crop improvement programmes, haploids are of great importance because they**

- (a) Grow better even under adverse climatic conditions (b) Are useful in studies of meiosis.  
(c) Have less requirement for energy inputs  
(d) Give homozygous lines following diploidization

**103. Which one of the following pairs is *not* correctly matched?**

- (a) Production of sulphur dioxide: Burning of coal  
(b) Depletion of ozone layer: Release of chlorofluorocarbons in the atmosphere  
(c) Eutrophication: Increase in nitrogen and phosphorus contents in aquatic bodies  
(d) Decrease in B.O.D. of pond water: Increase in global temperature

**104. The National Wasteland Development Board now renamed Department of Land Resources is under the Union Ministry of**

- (a) Agriculture (b) Environment and Forests  
(c) Planning (d) Rural Development

**105. Which one of the following was the objective of signing the 'Montreal Protocol'?**

- (a) Protection of Wildlife  
(b) Protection of ozone layer  
(c) Control over the use of insecticides  
(d) Control of noise pollution

**106. Which one of the following is correct to measure I3-diversity ?**

- (a) Species richness within an ecosystem  
(b) Species evenness equitability  
(c) Degree of change in species composition along an environmental gradient  
(d) Species diversity of several habitats in a large geographical region

**107. The number of individuals in each population that can live in a particular ecosystem is limited; and that number is known as**

- (a) Biotic potential  
(b) Carrying capacity  
(c) Intrinsic natural increase  
(d) Reproductive capacity

**108. Consider the following codons:**

1. UAA
2. UAC
3. UAG

Which of these are considered to be the termination codons in protein synthesis?

- (a) 1, 2 and 3
- (b) 1 and 2
- (c) 2 and 3
- (d) 1 and 3

**109. The function of 'reverse transcriptase' is to**

- (a) Transcribe a complementary DNA from an RNA strand
- (b) Transcribe a complementary RNA from an RNA strand
- (c) Translate messages for protein synthesis
- (d) Replicate DNA from a DNA strand

**110. Match List I (Scientist) with List II (Associated With) and select the correct answer using the code given below the lists:**

List I

- A. Garner and Allard
- B. Gregory and Purvis
- C. Chailakhyan
- D. Bunning

List II

1. Vernalisation
2. Physiological clocks
3. Photoperiodism
4. Florigen concept

A    B    C    D

(a) 2    4    I    3

(c) 3    4    I    2

A    B    C    D

(b) 2    I    4    3

(d) 3    I    4    2

**111. The shoot branching depends upon the development of axillary buds, but many of the buds in axillary position never grow out due to the**

- (a) Inhibitory factor present in the axillary bud
- (b) Inhibitory factor present in the apical bud
- (c) Interaction of factors present in both the axillary & apical bud
- (d) Inhibition under genetic control

**112. Consider the following statements:**

1. Anabesine
2. Anthocyanins
3. Betanidin

Which of these are coloured flavonoids?

- (a) 1 and 2
- (b) 2 and 3
- (c) 1 and 3
- (d) I, 2 and 3

**113. Growth of the pollen tube occurs**

- (a) Over its entire length
- (b) At apical and subapical zones
- (c) At apical zone only
- (d) At subapical zone only

- 114. Apospory is the development of an offspring from the**
- (a) Cell of nucellus
  - (b) Synergids or antipodals
  - (c) Haploid female gamete
  - (d) Haploid microspore
- 115. In which type of tapetum do the pro top lasts of tapetal cells mix or fuse and surround the developing microscopes in the anther?**
- (a) Glandular tapetum
  - (b) Secretory tapetum
  - (c) Amoeboid tapetum
  - (d) Dual tapetum
- 116. Which one of the following shows the last diploid stage in the life cycle of angiosperms?**
- (a) Microspore mother cell
  - (b) Zygote
  - (c) Nucellus
  - (d) Pollen grain
- 117. Match List I (Phenomenon) with List II (Scientist) and I select the correct answer using the code given below I the lists:**
- |                  |                |
|------------------|----------------|
| List I           | List II        |
| A. Fertilization | 1. Treub       |
| B. Triple fusion | 2. Camerarius  |
| C. Pollination   | 3. Strasburger |
| D. Chalazogamy   | 4. Nawaschin   |
- 
- |       |   |   |   |       |   |   |   |
|-------|---|---|---|-------|---|---|---|
| A     | B | C | D | A     | B | C | D |
| (a) 1 | 2 | 4 | 3 | (b) 3 | 4 | 2 | 1 |
| (c) 3 | 2 | 4 | I | (d) I | 4 | 2 | 3 |
- 118. The fertilization in which the entry of pollen tube into the ovule through the funiculus is known as**
- (a) Acrogamy
  - (b) Chalazogamy
  - (c) Mesogamy
  - (d) Porogamy
- 119. Which one of the following pairs is *not* correctly matched?**
- (a) Britten and Davidson: Gene regulation in eukaryotes
  - (b) Hershey and Chase: DNA as the hereditary material
  - (c) Feulgen and Rossenbeck: Localization of DNA in chromosomes
  - (d) Bateson and Punnet: Replication of DNA
- 120. Which one of the following plants is pollinated by bat?**
- (a) Bombax ceiba
  - (b) Calotropis procera
  - (c) Mucuna gigantean
  - (d) Nicotiana glauca