

1 Mark Questions

- The stalk with which the ovule remains attached to the placenta is called
(a) micropyle (b) chalaza
(c) funiculus (d) hilum
- The diploid chromosome number of an organism is $2n = 14$. What would be the expected chromosome numbers in a nullisomic?
(a) 12 (b) 13
(c) 15 (d) 16
- The mutagen ethidium bromide acts as a
(a) deaminating agent (b) alkylating agent
(c) intercalating agent (d) base analogue
- During photorespiration, the reactive oxygen species, H_2O_2 is produced in
(a) glyoxysome (b) lysosome
(c) peroxisome (d) dictyosome
- One of the defence mechanisms adopted by plants for detoxification of heavy metals is the synthesis of
(a) phytochelatin (b) calmodulin
(c) tubulin (d) systemin
- In which one of the following phases of cell cycle, the drug colchicine exerts its effect?
(a) G_1 (b) G_2
(c) S (d) M
- The transition of water molecule from liquid to glassy state during cryopreservation is termed as
(a) vitrification (b) hyperhydricity
(c) cryoprotectant (d) habituation
- The DNA content of a nucleus can be measured by
(a) ESR spectroscopy
(b) FTIR spectroscopy
(c) Flow cytometry
(d) X-ray crystallography

- Retrograde signalling involves communication of
(a) nucleus to the chloroplast
(b) endoplasmic reticulum to the nucleus
(c) nucleus to the mitochondria
(d) chloroplast to the nucleus

- A photoautotrophic micropropagation system can be established by increasing the
(a) sucrose concentration in the culture medium
(b) CO_2 concentration in the culture medium
(c) agar concentration in the culture medium
(d) NH_4^+ concentration in the culture medium

2 Marks Questions

- Which of the following statements in photosynthesis are correct?
A. The absorption maxima for photosystem-I (PS-I) and PS-II are 680 nm and 700 nm, respectively.
B. Photosynthetic reaction centre contains 300 chlorophyll molecules and the release of one molecule of oxygen requires a minimum of 8 photons.
C. The non-photochemical quenching of excitation energy is enhanced by the presence of zeaxanthin.
D. The photochemical splitting of water occurs in PS-I.
(a) A and B (b) C and D
(c) A and D (d) B and C
- Which of the following statements are true on DNA delivery methods during plant transformation?
A. Single-stranded nicks are made in T-DNA border repeat by the *vir* D1, *vir* D2 and *vir* D3 protein complex.
B. *vir* A gene products form the export apparatus on the membrane for the transfer of T-DNA.
C. Gold/Tungsten particles are used as microprojectiles in biolistic method.
D. Acceleration of DNA-coated microprojectiles is carried out with compressed CO_2 .

- (a) A and D (b) C and D
(c) A and C (d) B and D

13. Match the following plant secondary compounds with their uses and source plants.

Compound	Use	Plant Species
A. Guggulusterol	1. Anti-hypertensive	(i) <i>Lithospermum erythrorhizon</i>
B. Shikonin	2. Anti-rheumatic	(ii) <i>Catharanthus roseus</i>
C. Ajmalicine	3. Dye	(iii) <i>Glycyrrhiza glabra</i>
D. Glycyrrhizin	4. Sweetener	(iv) <i>Commiphora wightii</i>
	5. Anti-tumour	(v) <i>Swertia chirata</i>
	6. Anti-plaque	(vi) <i>Coptis japonica</i>

- (a) A-2-iv, B-3-i, C-1-ii, D-4-iii
(b) A-3-iv, B-1-i, C-5-ii, D-6-iii
(c) A-4-iv, B-3-i, C-1-v, D-2-vi
(d) A-4-iii, B-2-ii, C-5-i, D-6-iv

14. Match the gene of interest for various aspects of crop improvement.

Gene Insert	Aspects of Crop Improvement
A. <i>bar</i>	1. Tolerance to heavy metals
B. <i>vip 3A</i>	2. Nutritional improvement with increased vitamin-A
C. β - <i>lcy</i>	3. Insect resistance
D. <i>gsh-II</i>	4. Herbicide resistance
	5. Delayed ripening
	6. Resistance to fungal infection

Codes

- | | | | | | | | |
|-------|---|---|---|-------|---|---|---|
| A | B | C | D | A | B | C | D |
| (a) 4 | 3 | 5 | 6 | (b) 4 | 3 | 2 | 1 |
| (c) 2 | 4 | 5 | 3 | (d) 4 | 2 | 6 | 1 |

15. Match the plants with their storage proteins.

Plant	Protein
A. Rape seed	1. Kafirin
B. Pea	2. Vicilin
C. Sorghum	3. Gliadin
D. Wheat	4. Napin
	5. Zein
	6. Patatin

Codes

- | | | | | | | | |
|-------|---|---|---|-------|---|---|---|
| A | B | C | D | A | B | C | D |
| (a) 4 | 3 | 5 | 2 | (b) 2 | 3 | 6 | 1 |
| (c) 4 | 2 | 1 | 3 | (d) 3 | 2 | 4 | 5 |

16. Match the names of the disease with the causal organisms.

Disease	Causal Organism
A. False smut of rice	1. <i>Plasmopara viticola</i>
B. Ring rot of potato	2. <i>Colletotrichum falcatum</i>
C. Red rot of sugarcane	3. <i>Corynebacterium sepidonicum</i>
D. Downy mildew of grape	4. <i>Ustilagoidea virens</i>
	5. <i>Erwinia amylovora</i>
	6. <i>Synchytrium endobioticum</i>

Codes

- | | | | | | | | |
|-------|---|---|---|-------|---|---|---|
| A | B | C | D | A | B | C | D |
| (a) 1 | 5 | 2 | 4 | (b) 4 | 3 | 2 | 1 |
| (c) 6 | 2 | 4 | 1 | (d) 5 | 3 | 2 | 4 |

17. Identify the correct statements for phylogenetic systems of classification.

- A. The most popular phylogenetic systems of classification is that of George Bentham and Joseph Dalton Hooker and was published in 'Genera Plantarum'.
- B. A true phylogenetic system of classification was proposed by Adolf Engler and was published in 'Die Naturlichen Pflanzenfamilien'.
- C. The phylogenetic system of classification proposed by John Hutchinson was appeared in 'The Families of Flowering Plants'.
- D. The origin of dicot from primitive monocot was proposed by Arthur Cronquist in his book 'Systema Naturae'.
- (a) B and C (b) A and B
(c) C and D (d) A and D

18. Which of the following statements are true for the plastid genomes?

- A. Plastid genome is circular in nature with genome size of 120-160 kb.
- B. The plastid ribosomes are with sedimentation coefficient of 80 S.
- C. The gene for the small subunit of ribulose carboxylase (Rubisco) is located in the plastid.
- D. rRNAs in the plastid genome are arranged in one transcription unit.
- (a) A and B (b) B and D
(c) C and D (d) A and D

19. Identify the correct statements.

- A. Specialised parenchymatous cells with tannins and crystals of calcium oxalate are termed as sclereids.
- B. The sieve elements of angiosperms are surrounded by companion cells and are essential component of phloem loading.
- C. The exudation of water by guttation occurs through trichomes.
- D. The bulliform cells control the unrolling and hygroscopic movement of grass leaves.

(a) A and B

(b) A and C

(c) B and D

(d) A and D

20. Which of the following statements are incorrect on ecological point of view?

- A. Primary succession involving xerosere is initiated in a wet habitat.
- B. Halones commonly found in electronic equipment are one of the active force destroying the protective ozone layer in the stratosphere.
- C. Sympatric speciation occurs when the new species evolves in geographic isolation from the parent species.
- D. α -Diversity is the diversity of species within a habitat or community.

(a) A and B

(b) A and C

(c) B and C

(d) B and D