

## 1 Mark Questions

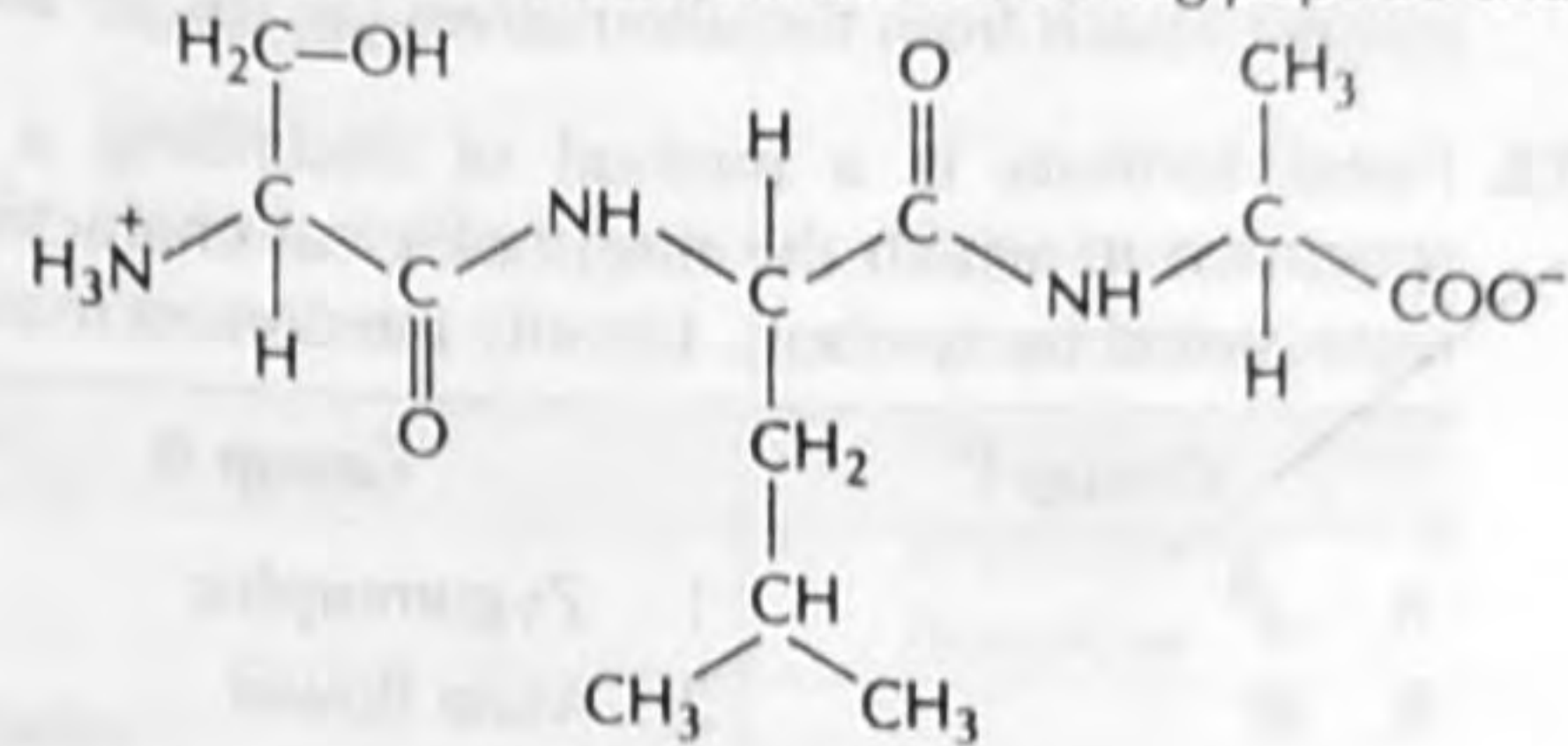
1. Kyoto protocol is related to  
(a) acid rain  
(b) photochemical smog  
(c) ozone hole  
(d) global warming
2. Phagotrophs are organisms  
(a) that feed on dead organic matter  
(b) that absorbs dissolved organic matter  
(c) that ingest other organisms or particulate organic matter  
(d) that manufacture food from simple inorganic substances
3. Identify the incorrect statement.  
(a) 2, 4-dichlorophenoxyacetic acid (2, 4-D) is the most commonly used chemical analogue of indole-3-acetic acid  
(b) In somatic embryogenesis, embryo initiation needs a high concentration of 2, 4-D  
(c) Crown-gall disease depends on the presence of  $T_1$ -plasmid in *Agrobacterium tumefaciens*  
(d) *Agrobacterium tumefaciens* is responsible for hairy root formation in plants
4. Choose the correct relation between Angstrom ( $\text{\AA}$ ) and nanometer (nm).  
(a)  $1 \text{\AA} = 10^1 \text{ nm}$   
(b)  $1 \text{\AA} = 10^{-1} \text{ nm}$   
(c)  $1 \text{\AA} = 10^{-2} \text{ nm}$   
(d)  $1 \text{\AA} = 10^2 \text{ nm}$
5. In hypogynous flower,  
(a) ovary occupies the highest position on the thallamus  
(b) ovary may be partially sunken in the thallamus  
(c) ovary is completely sunken in the thallamus  
(d) ovary is naked
6. Fill up the blanks with appropriate matches.  
The main axis of the inflorescence is known as .....  
and the stalk of the individual flower is called .....

- (a) pedicel; panicle  
(b) panicle; pedicel  
(c) pedicel; peduncle  
(d) peduncle; pedicel

7. Microorganisms responsible for nitrification are  
(a) *Nitrosomonas* and *Nitrobacter*  
(b) *Nostoc* and *Anabaena*  
(c) *Rhizobium* and *Azotobacter*  
(d) *Clostridium* and *Pseudomonas*

## 2 Marks Questions

8. Identify the amino acids in the following peptide chain.



- A. Iso-Leu-Ala
- B. Leu-Iso-Asn
- C. Ser-Leu-Ala
- D. Ser-Pro-Gln

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

9. Identify the correct statements.  
A. Vernalization is the process where flowering is promoted by heat-shock.  
B. The four different types of floral organs are initiated as separate whorls.  
C. The flowering stimulus is transported to the meristem via the xylem.  
D. Abscisic acid synthesis occurs via the carotenoid biosynthetic pathway.  
(a) A and B  
(b) B and D  
(c) C and D  
(d) A and C



10. Which of the following statements are incorrect?
- The frequency of recombination is a measure of linkage between genes on the same chromosome.
  - DNA polymerase I is the true DNA replicase in *E. coli*.
  - The conserved element closest to the transcription initiation site is called the CAAT box.
  - The introns in the nuclear pre-mRNAs are excised by spliceosomes.
- (a) A and B                      (b) B and C  
(c) A and C                      (d) A and D

11. Which of the following statements are true for transposable genetic elements?
- IS elements can be inserted at many different sites in bacterial chromosomes and plasmids.
  - In Tn5, the flanking IS elements are in the same orientation.
  - The Ac and Ds elements in maize were discovered by Barbara McClintock.
  - Tn10 consists of two IS elements flanking a gene for streptomycin resistance.
- (a) A and B                      (b) A and C  
(c) A and D                      (d) C and D

**Q. No. 12 to 20 are Matching Exercises**

In each question, each item A, B, C and D in Group I matches one of the items in Group II. Choose the correct match from the alternatives (a), (b), (c) and (d).

12. Floral formula is a method of describing a plant specimen in which the morphological characters are represented by symbols. Identify the correct matches.

Group I	Group II
A. ♂	1. Zygomorphic
B. ⊕	2. Male flower
C. C A	3. Epipetalous
D. ( )	4. Actinomorphic
	5. Superior ovary
	6. Inferior ovary

**Codes**

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

13. Identify the pathways where the following reactions occur.

Group I
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- Fatty acid + GTP + Co-A  $\rightleftharpoons$  Acyl Co-A + GDP + P<sub>i</sub>
- NH<sub>3</sub> + Glutamate + ATP  $\rightleftharpoons$  Glutamine + ADP + P<sub>i</sub>

- Succinate + E-FAD  $\rightleftharpoons$  Fumarate + E-FADH<sub>2</sub>
- Malonyl-S-Co-A + ACP-SH  $\rightleftharpoons$  Malonyl-S-ACP + Co-A-SH

**Group II**

- Fatty acid synthesis
- Fatty acid oxidation
- Oxidative phosphorylation
- Citric acid cycle
- Gluconeogenesis
- Amino acid biosynthesis

**Codes**

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

14.

Group I	Group II
A. <i>Ricinus communis</i>	1. Rice bran oil
B. <i>Jatropha curcas</i>	2. Mahua oil
C. <i>Pongamia pinnata</i>	3. Sunflower oil
D. <i>Madhuca indica</i>	4. Castor oil
	5. Karanja oil
	6. <i>Jatropha</i> oil

**Codes**

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

15.

Group I	Group II
A. Forster mechanism	1. The initial product inhibit the initial reaction
B. Ping-Pong reaction	2. The accumulation of end product inhibit the initial reaction
C. Feedback inhibition	3. Process of exciton transfer in chromophore molecule
D. DNA recombination	4. Double displacement reaction
	5. Michaelis-Menten enzyme kinetics
	6. Holliday model

**Codes**

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



Group I		Group II	
A. AG ↓ CT		1. <i>Eco</i> RI	
TC ↑ GA		2. <i>Alu</i> I	
B. GTPY ↓ PuAC		3. <i>Hpa</i> II	
CAPu ↑ PyTG		4. <i>Hind</i> III	
C. C ↓ C	AG	5. <i>Pst</i> I	
GG	C ↑ C	6. <i>Hinc</i> II	
D. A ↓ AGCTT			
TTC	GA ↑ A		

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

Group I		Group II	
A. Linnaeus		1. <i>Flora indica</i>	
B. William Roxburgh		2. Genera Plantarum	
C. Bentham and Hooker		3. Artificial-sexual system	
D. Engler		4. Sero diagnostic system	
		5. Phylogenetic system	
		6. The families of flowering plants	

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

Group I		Group II	
A. Monarch butterfly		1. Gene-gene matching	
B. Horizontal resistance		2. <i>Bt</i> crops	
C. Supper weed		3. Polygenic trait	
D. Biolistics		4. Tungsten/gold	
		5. Herbicide resistance	
		6. Pusztai affair	

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

Group I		Group II	
A. Water transport		1. Hydathodes	
B. Guttation		2. Xylem	
C. Harting net		3. Arbuscules	
D. Secondary active transport		4. Ectotrophic micorrhizal fungi	
		5. Proton motive force	
		6. Lenticels	

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

Group I		Group II	
A. Tobacco leaf curl bigeminivirus		1. <i>Culex tarsalis</i>	
B. Cauliflower mosaic caulimovirus		2. <i>Rhopalosiphium maidis</i>	
C. Rice tungro bacilliform badnavirus		3. <i>Bemisia tabaci</i>	
D. Wheat yellow leaf closterovirus		4. <i>Periplaneta americana</i>	
		5. <i>Nephotettis</i> sp.	
		6. <i>Brevicoryne brassicae</i>	

Codes							
A	B	C	D	A	B	C	D
(a) 2	3	6	4	(b) 3	6	5	2
(c) 3	4	6	5	(d) 2	4	5	6

21. Identify which of the following statements are incorrect?
- A. *Rhizoctonia solani* causes seedling blight of wheat.  
 B. *Gibberella zeae* causes root rot of wheat.  
 C. *Phytophthora infestans* causes late blight of potato.  
 D. *Tilletia caries* causes blunt of wheat.
- (a) A and B                      (b) A and C  
 (c) A and D                      (d) B and D