ICAR AIEEA PG

QUESTION PAPER



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PREVIEW QUESTION BANK

Module Name : PLANT BIOTECHNOLOGY-ENG
Exam Date : 29-Jun-2024 Batch : 10:00-12:00

Sr. No.	Client Question ID	Question Body and Alternatives	Marks	Negative Marks
Objective Question				
1	10001	Which of the following molecules can be classified under glycosphingolipid category? 1. Sphingomylein 2. Ceramide 3. Sulfatide 4. Lecithin A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	
Objective Question				
2	10002	The bicarbonate buffer is a principal buffering system in blood plasma. The ratio of the bicarbonate to carbonic acid required to maintain pH of plasma at 7.4 is: 1. 1:2 2. 2:1 3. 20:1 4. 1:20 A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0	
Objective Question				
3	10003		4.0	

Given below are two statements, one is labelled as Assertion (A) and other one labelled as Reason (R).

Assertion (A) : The disruption of β-oxidation of fatty acids in plants can potentially reduce stress-induced ROS accumulation and improve its stress tolerance.

Reason (R) : In plants, β-oxidation of fatty acids takes place predominantly in peroxisomes, where first enzyme of β-oxidation viz. fatty acyl CoA oxidase produces large amounts of hydrogen peroxide.

In light of the above statements, choose the *correct* answer from the options given below.

1. Both (A) and (R) are true and (R) is the correct explanation of (A).
2. Both (A) and (R) are true but (R) is NOT the correct explanation of (A).
3. (A) is true but (R) is false.
4. (A) is false but (R) is true.

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

4	10004	The serum level of which of the following metabolites can effectively distinguish "Vitamin B12 deficiency" from "Folate deficiency " ? 1. Homocysteine 2. Methyl Malonyl CoA 3. Methionine 4. Thymine A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0

Objective Question

5	10005		4.0

Match **List-I** with **List-II**

List-I	**List-II**
Name of the Enzyme	**Class of the enzyme**
(A). Pyruvate carboxylase	(I). Oxidoreductase
(B). Fumarase	(II). Hydrolase
(C). Phospholipase	(III). Lyase
(D). Nitrogenase	(IV). Ligase

Choose the **correct** answer from the options given below:

1. (A) - (I), (B) - (II), (C) - (III), (D) - (IV)
2. (A) - (IV), (B) - (III), (C) - (II), (D) - (I)
3. (A) - (I), (B) - (III), (C) - (IV), (D) - (II)
4. (A) - (IV), (B) - (I), (C) - (III), (D) - (II)

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

6 10006 4.0

Match **List-I** with **List-II**

List-I	List-II
Method	**Use in Protein Chemistry**
(A). Hydrazinolysis	(I). Site-specific cleavage of a polypeptide or protein
(B). Acid/Alkaline Hydrolysis	(II) Amino acid composition analysis of a polypeptide or protein
(C). Tryptic Digestion	(III). N-terminal determination of a polypeptide or protein
(D). Sanger Degradation	(IV).C-terminal determination of a polypeptide or protein

Choose the **correct** answer from the options given below:

1. (A) - (I), (B) - (II), (C) - (III), (D) - (IV)
2. (A) - (I), (B) - (III), (C) - (II), (D) - (IV)
3. (A) - (IV), (B) - (II), (C) - (I), (D) - (III)
4. (A) - (IV), (B) - (III), (C) - (I), (D) - (II)

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

7 10007 4.0

The chemical linkage(s) between the β-D-glucopyranose residues in the structure of β-glucans isolated from different sources such as cereals, mushroom, bacteria and yeast could be:

(A). Both β-(1,3) and β-(1,6)

(B). Both β-(1,3) and β-(1,4)

(C). β-(1,3) only

(D). Both β-(1,4) and β-(1,6)

Choose the ***correct*** answer from the options given below:

1. (A), (B) and (D) only.
2. (A), (B) and (C) only.
3. (C) only.
4. (B)and (D) only.

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

8 | 10008 | 4.0

Given below are two statements, one is labelled as Assertion (A) and other one labelled as Reason (R).

Assertion (A) : Iodoacetate selectively inhibits the glycolytic enzyme glyceraldehyde-3-phosphate dehydrogenase.

Reason (R) : Iodoacetate is a chelating agent that chelates the magnesium ion and makes it unavailable for the catalytic action of glyceraldehyde-3-phosphate dehydrogenase.

In light of the above statements, choose the *correct* answer from the options given below.

1. Both (A) and (R) are true and (R) is the correct explanation of (A).
2. Both (A) and (R) are true but (R) is NOT the correct explanation of (A).
3. (A) is true but (R) is false.
4. (A) is false but (R) is true.

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

9 | 10009 | 4.0

Which of the following statements is true about the Citrate?

(A). It is a secondary alcohol

(B). It is a chiral molecule

(C). It is formed by Claisan condensation reaction

(D). It is prochiral and a tertiary alcohol

Choose the ***correct*** answer from the options given below:

1. (A), (B) and (C) only.
2. (C) and (D) only.
3. (A) and (C).
4. (B) and (C) only.

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

10 | 10010 | 4.0

The Dihomo-Gamma-Linolenic acid (DGLA, cis,cis,cis-8,11,14-eicosatrienoic acid) is:

(A). an ω−6 fatty acid

(B). formed by conjugation of two linolenic acid molecules

(C). formed by elongation of γ-linolenic acid

(D). formed by isomerization of α-Linolenic acid

Choose the ***correct*** answer from the options given below:

1. (A) and (D) only
2. (A) only
3. (A) and (C) only
4. (B) only

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

11	10011	In spectrophotometry, if transmittance value of a solution is 75%, then its absorbance would be equal to: 1. 0.125 2. 0.301 3. 0.602 4. 0.699 A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0

Objective Question

12	10012	A dual affinity nitrate transporter (NPF 6.3) operates as both a low- and high-affinity transporter. Its ability to switch between two affinity modes depends upon its: 1. Redox state 2. Nitration state 3. Phosphorylation state 4. Cellular location and interaction with other proteins A1 : 1 A2 : 2	4.0

A3 : 3

A4 : 4

Objective Question

13 | 10013 | 4.0

Match **List-I** with **List-II**

List-I	**List-II**
(Enzyme)	**(Post Translation modification for regulation)**
(A). Nitrogenase	(I). Phosphorylation and 14 3 3 proteins
(B). Glutamine synthetase	(II). ADP-ribosylation
(C). Nitrate reductase	(III). Adenylylation
(D). Rubisco	(IV). S-Nitrosylation

Choose the **correct** answer from the options given below:

1. (A) - (I), (B) - (II), (C) - (III), (D) - (IV)
2. (A) - (II), (B) - (I), (C) - (III), (D) - (IV)
3. (A) - (II), (B) - (III), (C) - (IV), (D) - (I)
4. (A) - (III), (B) - (II), (C) - (I), (D) - (IV)

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

14 | 10014 | 4.0

The pyruvate caroxylase catalyzed conversion of pyruvate to oxaloacetate is a(an)

1. Anaplerotic reaction
2. Cataplerotic
3. Elimination reaction
4. Hydrolytic reaction

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

15 | 10015 | 4.0

Amyloids- the insoluble fibrous aggregates deposited in certain tissues- which result in the development of fatal human diseases, can chemically be regarded as:

1. Resistant starch
2. Prebiotics
3. Glycolipids
4. Misfolded proteins

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

16 | 10016 | 4.0

Given below are two statements, one is labelled as Assertion (A) and other one labelled as Reason (R).

Assertion (A) : Peptidoglycan-containing bacterial cell wall is resistant to hydrolytic action of many proteases.

Reason (R) : The presence of D-amino amino acids in the peptidoglycan structure of bacterial cell wall makes it resistant to most proteases.

In light of the above statements, choose the *correct* answer from the options given below.

1. Both (A) and (R) are true and (R) is the correct explanation of (A).
2. Both (A) and (R) are true but (R) is NOT the correct explanation of (A).
3. (A) is true but (R) is false.
4. (A) is false but (R) is true.

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

17 | 10017 | 4.0

Match **List-I** with **List-II**

List-I	List-II
(Compound)	(Vitamin D derivative)
(A). Ergocalciferol	(I). Vitamin D2
(B). Cholecalciferol	(II). 25-Hydroxy Vitamin D3
(C). Calcidiol	(III). 1,25-Dihydroxy Vitamin D3
(D). Calcitriol	(IV). Vitamin D3

Choose the **correct** answer from the options given below:

1. (A) - (I), (B) - (II), (C) - (III), (D) - (IV)
2. (A) - (I), (B) - (III), (C) - (II), (D) - (IV)
3. (A) - (I), (B) - (IV), (C) - (II), (D) - (III)
4. (A) - (I), (B) - (IV), (C) - (III), (D) - (II)

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

18 10018

Given below are two statements, one is labelled as Assertion (A) and other one labelled as Reason (R).

Assertion (A) : During evolution, some species, including humans, became dependent on dietary vitamin C due to loss of their ability to biosynthese ascorbic acid (AA) on their own.

Reason (R) : The loss of ability for the biosynthesis of ascorbic acid in human is due to the inactivation of an important enzyme viz. L-Gulono-Lactone Oxidase (GLO).

In light of the above statements, choose the *correct* answer from the options given below.

1. Both (A) and (R) are true and (R) is the correct explanation of (A).
2. Both (A) and (R) are true but (R) is NOT the correct explanation of (A).
3. (A) is true but (R) is false.
4. (A) is false but (R) is true.

4.0

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

19 | 10019 | 4.0

Rubisco activase is a (an)

(A). Catalytic chaperone

(B). ATP-dependant enzyme

(C). Enzyme that activates Rubisco by promoting the entry of sugar phosphates to its active site

(D). Enzyme that activates Rubisco by increasing its carbamylation

Choose the ***correct*** answer from the options given below:

1. (A), (B) and (D) only
2. (A), (B) and (C) only
3. (B) and (C) only
4. (A) and (D) only

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

20 | 10020

The enzyme glutamine oxoglutarate amino transferase (GOGAT) is also known as

1. Glutamate dehydrogenase
2. Glutamine synthetase
3. Glutamate synthase
4. Ureide Synthase

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

21 | 10021 | 4.0

Which of the following molecules can be considered as a lipid?

(A). Ubiquinone

(B). Retinol

(C). Dolichol

(D). β-Carotene

Choose the ***correct*** answer from the options given below:

1. (A), (B) and (D) only
2. (B) and (D) only
3. (A), (B), (C) and (D)
4. (B), (C) and (D) only

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

22 | 10022 | 4.0

The sequence of action of following enzymes of plant fatty acid synthase complex is

(A). β-Ketoacyl-ACP reductase

(B). β-Ketoacyl-ACP synthase

(C). β-Hydroxyacyl-ACP dehydratase

(D). Enoyl-ACP reductase

Choose the **correct** answer from the options given below:

1. (A), (B), (C), (D)
2. (B), (A), (C), (D)
3. (A), (C), (D), (B)
4. (D), (A), (B), (C)

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

23 | 10023 | 4.0

Given below are two statements, one is labelled as Assertion (A) and other one labelled as Reason (R).

Assertion (A) : Sorghum is a C3 plant.

Reason (R) : In Sorghum, the primary CO_2 acceptor is a 3-carbon molecule Phosphoenolpyruvate

In light of the above statements, choose the correct answer from the options given below.

1. Both (A) and (R) are true and (R) is the correct explanation of (A).
2. Both (A) and (R) are true but (R) is NOT the correct explanation of (A).
3. (A) is true but (R) is false.
4. (A) is false but (R) is true.

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

24 | 10024 | 4.0

Acrylamide, a toxic and potentially carcinogenic compound, can be formed in high heated starchy food products such as potato chips by which of the following precursor molecules?

1. Asparagine
2. Acrylic acid
3. Sucrose
4. Raffinose

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

25 | 10025 | 4.0

The order of elution (first to last) of amino acids Histidine (H), Glutamic acid (E), and Lysine (K) from a cation exchange column with a buffer having pH 6.0 is (Given: The pK values of H, E, and K is 6.0, 4.25, and 10.5 respectively):

1. Glutamic acid, Histidine and Lysine
2. Lysine, Histidine and Glutamic acid
3. Histidine, Lysine and Glutamic acid
4. Glutamic acid, Lysine and Histidine

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

26	10026	The products of which of the following pair of *nif* genes control the expression of other nif genes? 1. *nif D* and *nif K* 2. *nif* A and *nif* L 3. *nif* N and *nif* Q 4. *nif* H and *nif* E A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0

Objective Question

27	10027	The DNA of the microorganisms living under conditions of extreme temperature is predominantly 1. Negatively supercoiled 2. Positively supercoiled 3. Relaxed 4. Extensively methylated A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0

Objective Question

28	10028		4.0

Match **List-I** with **List-II**

List-I	List-II
Form of DNA	**Characteristic of DNA**
(A). A-DNA	(I). Triplex DNA
(B). B-DNA	(II).Short, broad and right-handed
(C). Z-DNA	(III). Longer, thinner and right-handed.
(D). H-DNA	(IV). The conformation of glycosyl bond is *anti* at Cytosine and *syn* at Guanine in alternating pyrimidine-purine sequence

Choose the **correct** answer from the options given below:

1. (A) - (I), (B) - (II), (C) - (III), (D) - (IV)
2. (A) - (III), (B) - (II), (C) - (I), (D) - (IV)
3. (A) - (II), (B) - (III), (C) - (IV), (D) - (I)
4. (A) - (III), (B) - (IV), (C) - (I), (D) - (II)

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

29 | 10029 | 4.0

Fishermen, in certain parts of the world follow a practice of beating the roots of tree along riverbanks in a manner that transfers the extract of the roots into water. This practice paralyzes fishes and makes them easy prey. The most acceptable reason for this observation is:

1. Rotenone is released from the roots of the plants that blocks the Electron Transport Chain
2. Heavy metal toxicity of the fishes
3. Inhibition of dopamine synthesis
4. Inhibition of GABA-a neurotransmitter- synthesis

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

30 | 10030 | 4.0

Match **List-I** with **List-II**

List-I	List-II
(Protein)	Feature
(A) α-Keratin	(I). Contains predominantly α-helices in its secondary structure
(B). Collagen	(II). Rich in Cysteine residues
(C). Myoglobin	(III). Rich in Glycine, Proline and Hydroxyproline
(D). Concanavalin A	(IV). Contains β-pleated sheets in high abundance in its secondary structure

Choose the **correct** answer from the options given below:

1. (A) - (I), (B) - (II), (C) - (III), (D) - (IV)
2. (A) - (II), (B) - (III), (C) - (I), (D) - (IV)
3. (A) - (III), (B) - (II), (C) - (IV), (D) - (I)
4. (A) - (III), (B) - (IV), (C) - (I), (D) - (II)

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

31 | 10031 | 4.0

Which of the following cannot be the form of a plant tissue culture method

1. Callus culture
2. Suspension culture
3. Organ culture
4. Viticulture

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

32 | 10032 | 4.0

Which of the following will be present in the highest amount in the plant tissue culture media

1. H_3BO_4
2. NH_4NO_3
3. NAA
4. Glycine

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

33 | 10033 | 4.0

Clonal propagation should not be used for the multiplication of following species

1. Slow growing
2. Male-sterile lines
3. Wheat seedlings
4. Vegetatively propagated

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

34 | 10034 | 4.0

Which of the following enzyme finally transfers ubiquitin to the target protein

1. 26S protease complex
2. E2
3. E3
4. E1

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

35 | 10035 | 4.0

Which of the following condition will favour synthesis of β galactosidase in *E. coli* cells

1. Growing them in a nutrient medium containing glucose as a C source
2. Growing them in a nutrient medium containing glycerol as a C source
3. Growing them in a nutrient medium containing lactose as a C source
4. Growing them in a nutrient medium containing some antibiotic into it

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

36 | 10036 | 4.0

Conventionally the -10 (5' TATAAT) and -35 (5' TTGACA) regions are denoted in

1. On the same strand which is used a template strand of DNA
2. On the same strand which is used a coding strand of DNA
3. On the same strand which is used a sense strand of DNA
4. On the same strand which is used a coding strand of DNA downstream to the +1 site

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

37 | 10037 | 4.0

Which of the following enzyme is used in second strand cDNA synthesis

1. RNase A
2. S1 nuclease
3. RNase H
4. AMV-RT

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

38 | 10038 | 4.0

Which of the following formulae may be used to estimate the concentration of RNA by UV spectrophotometer

1. 40 x A_{260}
2. 50 x A_{260}
3. 40 x A_{280}
4. 50 x A_{280}

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

39 10039 4.0

Large fragment of DNA (chromosome) is separated by

1. Pulsed Field Gel Electrophoresis
2. Agarose Gel Electrophoresis
3. Polyacrylamide Gel Electrophoresis
4. SDS- Polyacrylamide Gel Electrophoresis

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

40 10040 4.0

Which of the following step of Polymerase Chain Reaction cycle operates at highest temperature

1. Polymerization
2. Primer annealing
3. Denaturation
4. Primer extension

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

41 10041 4.0

		Which of the following DNA sequencing method uses dideoxyadenosine triphosphate 1. Maxam and Gilbert 2. Sanger 3. Chemical 4. Direct PCR sequencing A1 : 1 A2 : 2 A3 : 3 A4 : 4	
Objective Question			
42	10042	A protein coding gene of an organism with unknown genome sequence can be isolated from 1. Genomic library 2. cDNA library 3. Amplification with gene specific primer 4. Amplification with degenerate primers A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0
Objective Question			
43	10043	Expression of a gene can be measured by 1. Amplifying the gene by PCR 2. Reverse transcribing the cDNA of the gene followed by polymerization 3. Hybridizing the gene with a specific probe 4. Cloning the gene in a heterologous system A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0
Objective Question			
44	10044		4.0

Which of the following statement(s) is/are true:

(A). RNA polymerase lacks nuclease activity

(B). The error rate of RNA synthesis much higher than DNA synthesis

Choose the ***correct*** answer from the options given below:

1. (A) only
2. (B) only
3. Both (A) and (B)
4. Neither (A) nor (B)

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

45	10045	Which of the following is true for 35S promoter 1. Constitutive promoter 2. Seed-specific promoter 3. Salt-stress specific promoter 4. Heat-specific promoter A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0

Objective Question

46	10046	Which of the following scorable marker fluoresces bright green color 1. *uidA* 2. GFP 3. lux 4. nptII A1 : 1 A2 : 2 A3 : 3	4.0

A4 : 4

Objective Question

47 | 10047 | 4.0

The term "heterosis" was first used by

1. Powers
2. Shull
3. Davenport
4. Keeble and Pellew

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

48 | 10048 | 4.0

The type of chromosome in which the centromere is located at the end of the chromosome is known as

1. Acrocentric
2. Telocentric
3. Metacentric
4. Subterminal

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

49 | 10049 | 4.0

Which of the following method of recombination in bacteria is DNase sensitive

1. Transformation
2. Transduction
3. Conjugation
4. Sexduction

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

50	10050	Which of the following method requires availability of antibody 1. Yeast Two Hybrid Assay 2. Pull Down Assay 3. Split Ubiquitin Assay 4. BiFC A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0

Objective Question

51	10051	The head quarter of ICAR is located at 1. New Delhi 2. Hyderabad 3. Lucknow 4. Karnal A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0

Objective Question

52	10052	Which of the following cell organelle has connection with male sterility 1. Mitochondria 2. Chloroplast 3. Peroxisome 4. ER A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0

Objective Question

53	10053		4.0

Which of the following is required in CRISPR-Cas9 approach of gene editing

1. Guide RNA
2. Micro RNA
3. Small RNA
4. Long non coding RNA

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

54 | 10054 | 4.0

Which of the following are applications of proteomics

(A). Mining of the proteins in a sample

(B). Protein-expression profiling

(C). Determination of native structure of a protein

(D). Mapping of protein modification

Choose the ***correct*** answer from the options given below:

1. (A), (B) and (C) only
2. (B), (C) and (D) only
3. (A), (C) and (D) only
4. (A), (B) and (D) only

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

55 | 10055 | 4.0

Match **List-I** with **List-II**

List-I	List-II
(A). Semiconservative DNA replication	(I). Temin and Baltimore
(B). Reverse transcriptase	(II). Charpentier and Doudna
(C). Gene Editing	(III). Sanger
(D). Insulin	(IV). Watson and Crick
	(V). Harshey and Chase

Choose the **correct** answer from the options given below:

1. (A) - (V), (B) - (I), (C) - (III), (D) - (IV)
2. (A) - (I), (B) - (II), (C) - (III), (D) - (IV)
3. (A) - (IV), (B) - (I), (C) - (II), (D) - (III)
4. (A) - (III), (B) - (IV), (C) - (I), (D) - (II)

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

56 | 10056 | 4.0

In a monohybrid cross, which of the following is always completely heterozygous?

1. F_1 generation
2. F_2 generation
3. F_3 generation
4. P generation

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

57 | 10057 | 4.0

Tallness (T) is dominant to dwarfness (t), while red (R) flower color is dominant to white (r). The heterozygous condition results in pink (Rr) flower color. A dwarf, red snapdragon is crossed with a plant homozygous for tallness and white flowers. What are the genotype and phenotype of the F1 individuals?

1. ttRr-dwarf and pink
2. ttrr-dwarf and white
3. TtRr-tall and red
4. TtRr-tall and pink

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

58	10058	The process in eukaryotes that results in the production of gametes is 1. Mitosis 2. Meiosis 3. Cytokinesis 4. Karyokinesis A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0

Objective Question

59	10059	A situation where each allele produces a protein that can be detected in the heterozygote is called 1. Dominance 2. Incomplete dominance 3. Co Dominance 4. Over Dominance A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0

Objective Question

60	10060		4.0

Prions are

1. RNA viruses
2. Eukaryotes
3. Proteinaceous infectious particle
4. Archea

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

61 | 10061 | 4.0

In lac operon, the regulatory protein called repressor binds to :

1. Promoter
2. Operator
3. Enhancer
4. Regulator

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

62 | 10062 | 4.0

The sugarcane smut is caused by

1. *Sporisorium scitamineum*
2. *Puccinia erianthi*
3. *Glomerella tucumanensis*
4. *Fusarium sacchari*

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

63 | 10063 | 4.0

Haploids when treated with colchicine results in

1. Completely homozygous plants
2. Completely heterozygous plants
3. Homogeneous plants
4. Tetraploids

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

64 | 10064 | 4.0

The number of linkage group in a particular plants species is equal to the

1. Gametic chromosome number
2. Number genes present in that species
3. Half the number of genes present in that species
4. Somatic chromosome number of that species

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

65 | 10065 | 4.0

In eukaryotes, the immediate product of transcription of structural genes is

1. mRNA
2. hnRNA
3. tRNA
4. rRNA

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

66 | 10066 | 4.0

		High cytokinin concentration in the tissue culture media will lead to 1. Apical dominance 2. Inhibition of apical dominance 3. Leaf growth 4. Root growth A1 : 1 A2 : 2 A3 : 3 A4 : 4	
Objective Question			
67	10067	If nucleotide sequence on one strand is given, the nucleotides on the other strand can be found out because of 1. Complementary base pairing property 2. Antiparallel nature 3. Hydrogen bond formations between two strands 4. Phosphodiester bond A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0
Objective Question			
68	10068	In the cross AaBb x aabb if incomplete dominance is exhibited at both the loci, what genotypic ratio is expected in the resulting offspring? 1. 1:1:1:1 2. 9:3:3:1 3. 3:6:3:1:2:1 4. 1:2:1:2:4:2:1:2:1 A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0
Objective Question			
69	10069		4.0

		Identify the wrong statement about meiosis 1. Pairing of homologous chromosomes occur 2. Four haploid cells are formed 3. Chromosome number is reduced by half 4. Two cycles of DNA replication occurs A1 : 1 A2 : 2 A3 : 3 A4 : 4	
Objective Question			
70	10070	Which of the following is a symbiotic nitrogen fixer? 1. *Ensifer fredii* 2. *Acetobacter diazotrophicus* 3. *Azospirillum lipoferrum* 4. *Pseudomonas marginalis* A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0
Objective Question			
71	10071	In both mitosis and meiosis, sister chromatids separate during anaphase. But the number of haploid and diploid cells produced by meiosis and mitosis are 1. 6 and 3 2. 4 and 2 3. 2 and 4 4. 3 and 6 A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0
Objective Question			

72	10072	Which of the following statements about mitochondria is wrong? 1. They have their own DNA which can replicate independently 2. Mitochondrial matrix posesses its own ribosomes 3. They do not synthesize any proteins 4. Mitochondria divide similarway as prokaryotic binary fission A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0

Objective Question

73	10073	Which of the following mechanisms is not employed by bacteria that move by gliding ? 1. Polysaccharide excretion 2. Twitching 3. Rotating glide proteins 4. Rotating flagella A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0

Objective Question

74	10074		4.0

Match **List-I** with **List-II**

List-I	List-II
(A). Incomplete dominance	(I). Albinism in plants
(B). Co dominance	(II). Heterozygous phenotype is intermediate to homozygous parents
(C). Multiple alleles	(III). Heterozygote phenotype is mixture of phenotypes of homozygous parents
(D). Lethal alleles	(IV). Coat colour in rabbits

Choose the **correct** answer from the options given below:

1. (A) - (III), (B) - (II), (C) - (IV), (D) - (I)
2. (A) - (II), (B) - (III), (C) - (I), (D) - (IV)
3. (A) - (II), (B) - (III), (C) - (IV), (D) - (I)
4. (A) - (III), (B) - (II), (C) - (I), (D) - (IV)

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

75	10075	C value refers to the DNA content in haploid cell and has no correlation with the complexity of the organism. Which of the following explains this C value paradox? 1. Polyploidy 2. Mutations 3. Non coding DNA 4. Coding DNA A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0

Objective Question

76	10076		4.0

Which one of the below statements is not true with respect to DNA microarray?

1. DNA microarrays comprise known DNA sequences spotted on a small chip
2. Genome wide transcription analysis can be performed using this technology
3. Arrays can be designed and used for genome wide genotyping single nucleotide polymorphism
4. Array comparative genomic hybridization cannot be used to detect copy number changes in any DNA sequence between two samples

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

77	10077	Which one of the following is not true of the attenuation that controls gene expression? 1. It is seen in tryptophan operon 2. It is a mechanism whereby transcription is controlled before the initiation of of the mRNA synthesis 3. Attenuation depends on the stem and loop structures in the mRNA 4. In eukaryotes, there is no exact equivalent of attenuation as transcription and translation are spatially separated. A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0

Objective Question

78	10078	Which one of the following is not true of mycoplasmas? 1. They do not have cell wall 2. They cannot be cultured in laboratory 3. Lipogylcans in mycoplasma help in attachment to cell surface receptors of animal cells 4. They do not stain gram positively A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0

Objective Question

79	10079		4.0

Which one of the following is not true of the genetic code?

1. Changes in the universal genetic code have occurred in some species
2. Modifications in the anticodon do not affect the pattern of wobble pairing
3. Some of the codons cause termination of translation
4. In *Euplotes crassus*, UGA codon specifies both selenocysteine and cysteine

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

80 | 10080 | 4.0

Heat shock method is used to bring about

1. Electroporation
2. Transduction
3. Transformation
4. Conjugation

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

81 | 10081 | 4.0

Which hormone is primarily responsible for the inhibition of lateral bud growth and maintenance of apical dominance?

1. Gibberellins
2. Auxins
3. Cytokinins
4. Abscisic Acid

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

82 | 10082 | 4.0

What type of plants require a period of uninterrupted darkness to induce flowering?

1. Short-day plants
2. Long-day plants
3. Day-neutral plants
4. Facultative Long-day plants

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

83	10083	Which one of the following is vascular tissue? 1. Collenchyma tissue 2. Epidermal tissue 3. Xylem 4. Palisade parenchyma A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0

Objective Question

84	10084	What is the primary environmental cue that triggers flowering in many plants? 1. Temperature 2. Light intensity 3. Soil pH 4. Humidity A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0

Objective Question

85	10085		4.0

Exudation of sap from the cut surface of the stem of a well-watered herbaceous plant is due to the positive pressure in the xylem, which is termed as

1. Transpiration pull
2. Root pressure
3. SPAC
4. Root hydraulic conductivity

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

86	10086	The amount of CO_2 assimilated by photosynthesis divided by amount of water transpired by transpiration process is known as 1. Water use efficiency 2. Transpiration ratio 3. Nutreint Use Efficiency 4. Quantum efficiency A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0

Objective Question

87	10087	Identify the crop with correct matching. A. Sugarcane: Kranz anatomy B. Pineapple: C4 plant C. Mulberry: C3 plant D. Sunflower: C3 plant 1. A, C and D only 2. A, B and D only 3. A and B only 4. B and D only A1 : 1 A2 : 2	4.0

A3 : 3

A4 : 4

Objective Question

88 | 10088 | 4.0

The breakdown product of DNA (capable of inducing cell division) which was later identified as cytokinin is

1. *trans*-Zeatin
2. Kinetin
3. Benzyladenine
4. Thidiazuron

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

89 | 10089 | 4.0

Match **List-I** with **List-II**

List-I	**List-II**
(Physiological process)	**(Site of the reaction in plant cells)**
(A) Glycolysis	(I). Mitochondrial Matrix
(B). Citric Acid Cycle	(II). Storma of Chloroplast
(C). F_0-F_1 ATP synthase	(III). Inner memberane of Mitochondria
(D). Calvin Cycle	(IV). Cytoplasm

Choose the **correct** answer from the options given below:

1. (A) - (IV), (B) - (I), (C) - (III), (D) - (II)
2. (A) - (I), (B) - (II), (C) - (III), (D) - (IV)
3. (A) - (I), (B) - (II), (C) - (IV), (D) - (III)
4. (A) - (III), (B) - (IV), (C) - (I), (D) - (II)

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

90	10090	Which one of the following is not a component of thylakoid integral membrane protein? 1. Light Harvesting Complex (LHC) 2. ATP synthase 3. Alternative oxidase (AOX) 4. O_2-Evolving complex (OEC) A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0

Objective Question

91	10091	Pressure potential in the xylem of an actively transpiring plant is 1. Zero (0) 2. Negative (-) 3. Positive (+) 4. + 0.1 MPa A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0

Objective Question

92	10092	Which one the following statements is correct? (A). Seeds can remain dormant for indefinite periods until environmental conditions are favorable for germination (B). Seed dormancy in crops can be broken by mechanical scarification or chemical treatments (C). Light is a necessary environmental factor for the germination of all seeds (D). A thick seed coat and impermeability can prevent water and gases from entering the seed, delaying germination Choose the ***correct*** answer from the options given below: 1. (A) and (D) 2. (B) only 3. (C) only 4. (B) and (C)	4.0

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

93 | 10093 | 4.0

Ethylene is a plant hormone known to influence post-harvest ripening. Which of the following fruits is not sensitive to ethylene?

1. Banana
2. Tomato
3. Mango
4. Grapes

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

94 | 10094

The organelles involved in the process of photorespiration are

(A). Chloroplast

(B). Mitochondria

(C). Peroxisomes

(D). Vacuole

Choose the ***correct*** answer from the options given below:

1. (A), (B) and (C)
2. (A), (B) and (D)
3. (A), (B), (C) and (D)
4. (B), (C) and (D)

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

95 | 10095 | 4.0

		The water conetnt in highly perishable with short shelf-life horticultural produce is 1. 30-40 per cent 2. 20-30 per cent 3. 80-90 per cent 4. 3-8 per cent A1 : 1 A2 : 2 A3 : 3 A4 : 4	
Objective Question			
96	10096	The maturity stage at which fruits/vegetables reach the ideal condition required for consumers, develop acceptable flavour or appearance and have an adequate shelf life is called 1. Pre-harvest maturity 2. Physiological maturity 3. Over maturity 4. Critical maturity A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0
Objective Question			
97	10097	In field crops Harvest Index is calculated using the growth parameters 1. Total photosynthesysing area and biomass 2. Total biological mass and economical yield 3. Total leaf area and grain yield 4. Plant height and total leaf area A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0
Objective Question			
98	10098		4.0

		What is totipotency in biology? 1. The ability of a cell to differentiate into various specialized cell types 2. The ability of a cell to divide by mitosis 3. The ability of a cell to replicate its celluar components 4. The ability of a cell to replicate its DNA A1 : 1 A2 : 2 A3 : 3 A4 : 4	
Objective Question			
99	10099	Which wavelength of light is primarily responsible for inducing the opening of stomata in plant leaves? 1. Red light 2. Blue light 3. Green light 4. Ultraviolet light A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0
Objective Question			
100	10100	How does the pressure flow hypothesis explain the movement of sugars in the phloem? 1. Sugars move from areas of low pressure to high pressure 2. Sugars move from areas of high pressure to low pressure 3. Sugars move in resposne to the force of gravity 4. Sugars move passively through diffusion A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0
Objective Question			
101	10101		4.0

		The extent of water aborbed by plant roots, carried through the plant and that gets evaporated from leaf surface is 1. (~ 20%) 2. (~ 40%) 3. (~ 60%) 4. (~ 90%) A1 : 1 A2 : 2 A3 : 3 A4 : 4	
Objective Question			
102	10102	In crops that grow upto a height of about 1 meter, component of water potential that become non-significant for cell growth after cell division is (A). Solute potential (B). Pressure potential (C). Matric potential (D). Gravitational potential Choose the ***correct*** answer from the options given below: 1. (A), (B) and (D) only 2. (C) and (D) only 3. (A), (B) and (C) only 4. (B), (C) and (D) only A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0
Objective Question			
103	10103		4.0

Identify the long day plants

(A). Sugarbeet

(B). Tobacco

(C). Cotton

(D). Potato

Choose the ***correct*** answer from the options given below:

1. (A), (B) and (D) only
2. (B) and (C) only
3. (A) and (D) only
4. (B) and (D) only

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

104	10104	The specialized plastids -serving as gravity sensors, that direct root growth downward into the soil, are 1. Chromoplasts 2. Chloroplasts 3. Gerontoplasts 4. Amyloplasts A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0

Objective Question

105	10105		4.0

Identify crops based on water requirement

(A). Maize < Sugarcane < Cowpea

(B). Sunflower < Pearlmillet < Soybean

(C). Rice < Sorghum < Redgram

(D). Pineapple < Amaranthus < Cotton

Choose the ***correct*** answer from the options given below:

1. (A) and (C) only.
2. (B) and (D) only.
3. (C) and (D) only
4. (D) only.

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

106	10106	During seed germination, large quantities of triacylglycerol in the form of oil are accumulated in this organelle 1. Pro-vacuoles 2. Sperosomes 3. Oleosins 4. Secretary vesicles A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0

Objective Question

107	10107		4.0

Idetify the the crops with low "Light Compensation Point"

(A). Lettuce

(B). Soybean

(C). Betelvine

(D). Fingermillet

Choose the ***correct*** answer from the options given below:

1. (B) and (D) only.
2. (A) and (C) only.
3. (D) only
4. (B) only.

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

108	10108	Identify the anaerobic nitrogen fixing bacteria (A). *Azatobacter* (B). *Rhodospirillum* (C). *Clostridium* (D). *Gloeotheca* Choose the ***correct*** answer from the options given below: 1. (B) and (C) only. 2. (D) only. 3. (A) only 4. (A) and (D) only. A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0

Objective Question

109	10109		4.0

Match **List-I** with **List-II**

List-I	**List-II**
(Enzyme / Process)	**(Electron donor / Requirement)**
(A). Nitrite reductase	(I). NADH
(B). APS sulfotransferase	(II). NADPH
(C). Fatty acid synthesis	(III). Glutathion
(D). Nitrate reductase	(IV). Ferridoxin (Reduced)

Choose the **correct** answer from the options given below:

1. (A) - (II), (B) - (IV), (C) - (III), (D) - (I)
2. (A) - (III), (B) - (II), (C) - (IV), (D) - (I)
3. (A) - (IV), (B) - (III), (C) - (II), (D) - (I)
4. (A) - (III), (B) - (IV), (C) - (I), (D) - (II)

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

110	10110		4.0

Match **List-I** with **List-II**

List-I	**List-II**
(Process / Enzyme)	**(Location in the cell)**
(A). Triacylglycerol synthesis	(I). Mitochondria
(B). Glycolate oxidase	(II). Plastids
(C). Hexose Monophosphate Shunt	(III). Endoplastic reticulum
(D). Serine synthesis in photorespiration	(IV). Peroxisome

Choose the **correct** answer from the options given below:

1. (A) - (IV), (B) - (III), (C) - (I), (D) - (II)
2. (A) - (II), (B) - (III), (C) - (IV), (D) - (I)
3. (A) - (III), (B) - (IV), (C) - (II), (D) - (I)
4. (A) - (III), (B) - (IV), (C) - (I), (D) - (II)

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

111	10111		4.0

Match **List-I** with **List-II**

List-I	List-II
(Time of opening/closure of stomata)	(Crop/plant examples)
(A). Stomata open throught the day and close during night	(I). Cabbage, Banana, Allium
(B). Stomata close for a few hours in the evening	(II). Amphibious plants: Emergent hydrophytes
(C). Stomata open for a few hours during the day	(III). Pea, Bean, Mustard
(D). Stomata remain open during day and night	(IV). Cereals

Choose the **correct** answer from the options given below:

1. (A) - (IV), (B) - (III), (C) - (II), (D) - (I)
2. (A) - (II), (B) - (IV), (C) - (I), (D) - (III)
3. (A) - (I), (B) - (III), (C) - (IV), (D) - (II)
4. (A) - (III), (B) - (I), (C) - (IV), (D) - (II)

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

112 10112

Identify the compound found to aid in defense against invading organisms in plants

(A). Jasmonates

(B). Salicylic acid

(C). Polyamines

(D). Brassinolates

Choose the ***correct*** answer from the options given below:

1. (A) and (D) only
2. (B) and (D) only
3. (C) and (D) only
4. (A) and (B) only

4.0

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

113	10113	Identify the popular farming method gaining popularity among farmers that uses technology to manage crop production to maximize crop yield in the present day context 1. Hydroponics 2. Aquaponics 3. Precission farming 4. Verical farming A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0

Objective Question

114	10114	Major foreign exchange earner for India 1. Wheat 2. Rice 3. Coffee 4. Tea A1 : 1 A2 : 2 A3 : 3 A4 : 4	

Objective Question

115	10115	Hand refractometer "Brix" value at physiological maturity in sugarcane is 1. 4 to 8% 2. 10 to 12% 3. 18 to 20% 4. 28 to 30% A1 : 1	4.0

A2 : 2

A3 : 3

A4 : 4

Objective Question

116 | 10116 | 4.0

In the light reactions of photosynthesis, the sequence of electron flow from the exited P680 (PS II) to P700 (PSI) during non-cyclic photophosphorylation is:

1. P680* → Q_A → Q_B → Pheo → Cyt b_6f complex → Fd → P700
2. P680* → Pheo → Q_A → Q_B → Cyt b_6f complex → PC → P700
3. P680* → Q_A → Q_B → Pheo → PC → Cyt b_6f complex → Fd → P700
4. P680* → A_O → A_1 → FeS_x → Fd → Cyt b_6f complex → PC → P700

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

117 | 10117

Match **List-I** with **List-II**

List-I	**List-II**
(Physiological activity/action in cell)	**(Nutrient involved)**
(A). Specific inhibitor of acid phosphatase	(I). Potassium
(B). Activation of α-amylase activity	(II) Copper
(C). Constituent of ascorbic acid oxidase	(III). Molybdenum
(D). Accumulation of putriscine under nutrient deficiency	(IV). Chlorine

Choose the **correct** answer from the options given below:

1. (A) - (IV), (B) - (III), (C) - (I), (D) - (II)
2. (A) - (III), (B) - (IV), (C) - (II), (D) - (I)
3. (A) - (II), (B) - (I), (C) - (IV), (D) - (III)
4. (A) - (IV), (B) - (I), (C) - (II), (D) - (III)

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

118	10118	Identify the compounds used as germicides in vase solutions to improve quality and longevity of cut flowers (A). Aluminium sulfate (B). Silver nitrate (C). 8 - Hydroxyquinoline sulfate (D). Aminocyclopropane carboxylic acid Choose the ***correct*** answer from the options given below: 1. (A) and (C) only 2. (A), (B) and (D) only 3. (B), (C) and (D) only 4. (A), (B) and (C) only A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0

Objective Question

119	10119	Examples of circadian rythm (A). Seed germination in cereals once favourable conditions are met (B). Root growth of plants into the soil (C). Opening and closing of stomata (D). Photosynthetic activity Choose the ***correct*** answer from the options given below: 1. (A) and (B) only 2. (B) and (C) only 3. (C) and (D) only 4. (A) only A1 : 1 A2 : 2 A3 : 3	4.0

A4 : 4

Objective Question

120	10120	In higher plants, zeatin is the most abundant cytokinin. In addition, cytokinins can also occur as (A). Riboside (B). Thidiazuron (C). Ribotide (D). Glycoside Choose the ***correct*** answer from the options given below: 1. (A) only 2. (A), (C) and (D) only 3. (A) and (C) only 4. (C) and (D) only A1 : 1 A2 : 2 A3 : 3 A4 : 4	4.0

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