

NEET UG-2023

[PAPER WITH ANSWER KEY]

HELD ON SUNDAY 07TH MAY 2023

BOTANY

SECTION-A

[Q.101] In tissue culture experiments, leaf mesophyll cells are put in a culture medium to form callus. This phenomenon may be called as :

- [1] Development
- [2] Senescence
- [3] Differentiation
- [4] Dedifferentiation

[ANS] 4

[Q.102] In the equation

$$GPP - R = NPP$$

GPP is Gross Primary Productivity

NPP is Net Primary Productivity

R here is _____.

- [1] Respiratory loss
- [2] Reproductive allocation
- [3] Photosynthetically active radiation
- [4] Respiratory quotient

[ANS] 1

[Q.103] Given below are two statements :

Statement I : The forces generated by transpiration can lift a xylem-sized column of water over 130 meters height.

Statement II : Transpiration cools leaf surfaces sometimes 10 to 15 degrees, by evaporative cooling.

In the light of the above statements, choose the most appropriate answer from the options given below :

- [1] Statement I is correct but Statement II is incorrect.
- [2] Statement I is incorrect but Statement II is correct.
- [3] Both Statement I and Statement II are correct.
- [4] Both Statement I and Statement II are incorrect.

[ANS] 3

[Q.104] In angiosperm, the haploid, diploid and triploid structures of a fertilized embryo sac sequentially are :

- [1] Synergids, Zygote and Primary endosperm nucleus
- [2] Synergids, antipodals and Polar nuclei
- [3] Synergids, Primary endosperm nucleus and zygote
- [4] Antipodals, synergids, and primary endosperm nucleus

[ANS] 1

[Q.105] Given below are two statements :

Statement-I : Endarch and exarch are the terms often used for describing the position of secondary xylem in the plant body.

Statement-II : Exarch condition is the most common feature of the root system.

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

- [1] Statement-I is correct but Statement-II is false.
- [2] Statement-I is incorrect but Statement-II is true.
- [3] Both Statement-I and Statement-II are true.
- [4] Both Statement-I and Statement-II are false.

[ANS] 2

[Q.106] How many ATP and NADPH_2 are required for the synthesis of one molecule of Glucose during Calvin cycle ?

- [1] 12 ATP and 16 NADPH_2
- [2] 18 ATP and 16 NADPH_2
- [3] 12 ATP and 12 NADPH_2
- [4] 18 ATP and 12 NADPH_2

[ANS] 4

[Q.107] Spraying of which of the following phytohormone on juvenile conifers helps in hastening the maturity period, that leads to early seed production?

- [1] Zeatin
- [2] Absciscic Acid
- [3] Indole-3-butyric Acid
- [4] Gibberellic Acid

[ANS] 4

[Q.108] Among eukaryotes, replication of DNA takes place in

- [1] G_1 phase
- [2] G_2 phase
- [3] M phase
- [4] S phase

[ANS] 4

[Q.109] Identify the correct statements:

- A. Detritivores perform fragmentation.
- B. The humus is further degraded by some microbes during mineralization.
- C. Water soluble inorganic nutrients go down into the soil and get precipitated by a process called leaching.
- D. The detritus food chain begins with living organisms.
- E. Earthworms break down detritus into smaller particles by a process called catabolism .

Choose the correct answer from the options given below:

- [1] C, D, E only
- [2] D, E, A only
- [3] A, B, C only
- [4] B, C, D only

[ANS] 3

[Q.110] Identify the pair of heterosporous pteridophytes among the following:

- [1] Psilotum and Salvinia
- [2] Equisetum and Salvinia
- [3] Lycopodium and Selaginella
- [4] Selaginella and Salvinia

[ANS] 4

[Q.111] Given below are two statements : One is labelled as **Assertion A** and the other is labelled as **Reason R** :

Assertion A : ATP is used at two steps in glycolysis.

Reason R : First ATP is used in converting glucose-6-phosphate and second ATP is used in conversion of fructose-6-phosphate into fructose-1-6-diphosphate. In the light of the above statements, choose the **correct** answer from the options given below :

- [1] A is true but R is false.
- [2] A is false but R is true.
- [3] Both A and R are true and R is the correct explanation of A.
- [4] Both A and R are true but R is NOT the correct explanation of A.

[ANS] 3

[Q.112] Among 'The Evil Quartet', which one is considered the most important cause driving extinction of species ?

- [1] Alien species invasions
- [2] Co-extinctions
- [3] Habitat loss and fragmentation
- [4] Over exploitation for economic gain

[ANS] 3

[Q.113] Unequivocal proof that DNA is the genetic material was first proposed by

- [1] Avery, Macleoid and McCarthy
- [2] Wilkins and Franklin
- [3] Fredeerick Griffith
- [4] Alfred Hershey and Martha Chase

[ANS] 4

[Q.114] The thickness of ozone in a column of air in the atmosphere is measured in terms of :

- [1] Decameter
- [2] Kilobase
- [3] Dobson units
- [4] Decibels

[ANS] 3

[Q.115] Which micronutrient is required for splitting of water molecule during photosynthesis ?

- [1] magnesium
- [2] copper
- [3] manganese
- [4] molybdenum

[ANS] 3

[Q.116] Family Fabaceae differs from Solanaceae and Liliaceae. With respect to the stamens, pick out the characteristics specific to family Fabaceae but not found in Solanaceae or Liliaceae.

- [1] Monodelphous and Monothealous anthers
- [2] Epiphyllous and Dithealous anthers
- [3] Diadelphous and Dithealous anthers
- [4] Polyadelphous and epipetalous stamens

[ANS] 3

[Q.117] Given below are two statements : One is labelled as Assertion A and the other is labelled as Reason R :

Assertion A : The first stage of gametophyte in the life cycle of moss is protonema stage.

Reason R : Protonema develops directly from spores produced in capsule.

In the light of the above statements, choose the most appropriate answer from the options given below:

- [1] A is correct but R is not correct.
- [2] A is not correct but R is correct.
- [3] Both A and R are correct and R is the correct explanation of A.
- [4] Both A and R are correct but R is NOT the correct explanation of A.

[ANS] 3

[Q.118] Expressed Sequence Tags (ESTs) refers to

- [1] All genes whether expressed or unexpressed
- [2] Certain important expressed genes.
- [3] All genes that are expressed as RNA
- [4] All genes that are expressed as proteins.

[ANS] 3

[Q.119] Frequency of recombination between gene pairs on same chromosome as a measure of the distance between genes to map their position on chromosome, was used for the first time by

- [1] Alfred Sturtevant
- [2] Henking
- [3] Thomas Hunt Morgan
- [4] Sutton and Boveri

[ANS] 1

[Q.120] Large, colourful, fragrant flowers with nectar are seen in :

- [1] bat pollinated plants
- [2] wind pollinated plants
- [3] insect pollinated plants
- [4] bird pollinated plants

[ANS] 3

[Q.121] Movement and accumulation of ions across a membrane against their concentration gradient can be explained by

- [1] Passive Transport
- [2] Active Transport
- [3] Osmosis
- [4] Facilitated Diffusion

[ANS] 2

[Q.122] Upon exposure to UV radiation, DNA stained with ethidium bromide will show

- [1] Bright yellow colour
- [2] Bright orange colour
- [3] Bright red colour
- [4] Bright blue colour

[ANS] 2

[Q.123] Given below are two statements: One is labelled as **Assertion A** and the other is labelled as **Reason R**.

Assertion A : Late wood has fewer xylary elements with narrow vessels.

Reason R: Cambium is less active in winters.

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

- [1] **A** is true but **R** is false.
- [2] **A** is false but **R** is true.
- [3] Both **A** and **R** are true and **R** is the correct explanation of **A**
- [4] Both **A** and **R** are true but **R** is NOT the correct explanation of **A**.

[ANS] 3

[Q.124] Axile placentation is observed in

- [1] Tomato, Dianthus and Pea
- [2] China rose, Petunia and Lemon
- [3] Mustard, Cucumber and Primrose
- [4] China rose, Beans and Lupin

[ANS] 2

[Q.125] The phenomenon of pleiotropism refers to

- [1] a single gene affecting multiple phenotypic expression.
- [2] more than two genes affecting a single character.
- [3] presence of several alleles of a single gene controlling a single crossover.
- [4] presence of two alleles, each of the two genes controlling a single trait

[ANS] 1

[Q.126] During the purification process for recombinant DNA technology, addition of chilled ethanol precipitates out

- [1] Histones
- [2] Polysaccharides
- [3] RNA
- [4] DNA

[ANS] 4

[Q.127] Which hormone promotes internode / petiole elongation in deep water rice ?

- [1] Ethylene
- [2] 2, 4-D
- [3] GA₃
- [4] Kinetin

[ANS] 1

[Q.128] The process of appearance of recombination nodules occurs at which sub stage of prophase I in meiosis ?

- [1] Diplotene
- [2] Diakinesis
- [3] Zygotene
- [4] Pachytene

[ANS] 4

[Q.129] What is the role of RNA polymerase III in the process of transcription in Eukaryotes?

- [1] Transcription of precursor of mRNA
- [2] Transcription of only snRNAs
- [3] Transcription of rRNAs (28S, 18S ;and 5.8S)
- [4] Transcription of tRNA, 5 srRNA and snRNA

[ANS] 4

[Q.130] What is the function of tassels in the corn cob?

- [1] To disperse pollen grains
- [2] To protect seeds
- [3] To attract insects
- [4] To trap pollen grains

[ANS] 4

[Q.131] In gene gun method used to introduce alien DNA into host cells, microparticles of _____metal are used.

- [1] Tungsten or gold
- [2] Silver
- [3] Copper
- [4] Zinc

[ANS] 1

[Q.132] Cellulose does not form blue colour with Iodine because

- [1] It does not contain complex helices and hence cannot hold iodine molecules.
- [2] It breaks down when iodine reacts with it.
- [3] It is a disaccharide
- [4] It is a helical molecule.

[ANS] 1

[Q.133] Which of the following stages of meiosis involves division of centromere ?

- [1] Anaphase II
- [2] Telophase
- [3] Metaphase I
- [4] Metaphase II

[ANS] 1

[Q.134] The reaction centre in PS II has an absorption maxima at

- [1] 660 nm
- [2] 780 nm
- [3] 680 nm
- [4] 700 nm

[ANS] 3

[Q.135] The historic Convention on Biological Diversity. 'The Earth Summit' was held in Rio de Janeiro in the year:

- [1] 1986
- [2] 2002
- [3] 1985
- [4] 1992

[ANS] 4

SECTION-B

[Q.136] Match List I with List II

List I

- A. M Phase
- B. G₂ phase
- C. Quiescent stage

List II

- I. Proteins are synthesized
- II. Inactive phase
- III. Interval between mitosis and initiation of DNA replication
- IV. Equational; division

D. G₁ phase

Choose the correct answer from the options given below:

- [1] A-IV, B-I, C-II, D-III
- [2] A-II, B-IV, C-IV, D-III
- [3] A-III, B-II, C-IV, D-I
- [4] A-IV, B-II, C-I, D-III

[ANS] 1

[Q.137] Given below are two statements:

Statement I : Gause 's 'Competitive Exclusion Principle' states that two closely related species competing for the same resources cannot co -exist indefinitely and competitively inferior one will be eliminated eventually.

Statement II: In general, carnivores are more adversely affected by competition than herbivores.

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

- [1] Statement I is correct but Statement II is false.
- [2] Statement I is incorrect but Statement II is true.
- [3] Both Statement I and Statement II are true
- [4] Both Statement I and Statement II are false

[ANS] 1

[Q.138] How many different proteins does the ribosome consist of ?

- [1] 40
- [2] 20
- [3] 80
- [4] 60

[ANS] 3

[Q.139] Match **List I** with **List II** :

List I

- A. Oxidative decarboxylation
- B. Glycolysis
- C. Oxidative phosphorylation
- D. Tricarboxylic acid cycle

List II

- I. Citrate synthase
- II. Pyruvate dehydrogenase
- III. Electron transport system
- IV. EMP pathway

Choose the correct answer from the options given below :

- [1] A-III, B-I, C-II, D-IV
- [2] A-II, B-IV, C-III, D-I
- [3] A-II, B-IV, C-II, D-I
- [4] A-II, B-IV, C-I, D-III

[ANS] 2

[Q.140] Which of the following statements are correct about Klinefelter's Syndrome ?

- A. This disorder was first described by Langdon Down (1866).
- B. Such an individual has overall masculine development. however, the feminine development is also expressed.
- C. The affected individual is short statured,
- D. Physical, psychomotor and mental development is retarded.
- E. Such individuals are sterile.

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

- [1] B and E only [2] A and E only [3] A and B only [4] C and D only

[ANS] 1

[Q.141] Melonate inhibits the growth of pathogenic bacteria by inhibiting the activity of

- [1] Lipase
- [2] Dinitrogenase
- [3] Succinic dehydrogenase
- [4] Amylase

[ANS] 3

[Q.142] Which of the following combinations is required for chemiosmosis ?

- [1] proton pump, electron gradient, ATP synthase
- [2] proton pump, electron gradient, NADP synthase
- [3] membrane, proton pump, proton gradient, ATP synthase
- [4] membrane, proton pump, proton gradient, NADP synthase

[ANS] 3

[Q.143] Match List I with List II :

- | List I | List II |
|--------------------|---|
| A. Cohesion | I. More attraction in liquid phase |
| B. Adhesion | II. Mutual attraction among water molecules |
| C. Surface tension | III. Water loss in liquid phase |
| D. Guttation | IV. Attraction towards polar surfaces |

Choose the correct answer from the options given below :

- [1] A-III, B-I, C-IV, D-II
- [2] A-II, B-I, C-IV, D-III
- [3] A-II, B-IV, C-I, D-III
- [4] A-IV, B-III, C-II, D-I

[ANS] 3

[Q.144] Match List I with List II:

- | List I | List II |
|---------------|---|
| A. Iron | I. Synthesis of auxin |
| B. Zinc | II. Component of nitrate reductase |
| C. Boron | III. Activator of catalase |
| D. Molybdenum | IV. Cell elongation and differentiation |

Choose the correct answer from the options given below.

- [1] A – III, B – I , C – IV, D - II
- [2] A – II, B – IV, C – I, D - III
- [3] A – III, B – II, C – I, D - IV
- [4] A – II, B – III,, C – IV, D - I

[ANS] 1

[Q.145] Main steps in the formation of Recombinant DNA are given below. Arrange these steps in a correct sequence.

- A. Insertion of recombinant DNA into the host cell.
- B. Cutting of DNA at specific location by restriction enzyme.
- C. Isolation of desired DNA fragment.
- D. Amplification of gene of interest using PCR.

Choose the correct answer from the options given below :

- [1] C, B, D, A [2] B, D, A, C [3] B, C, D, A [4] C, A, B, D

[ANS] 3

[Q.146] Match List I with List II :

- | List I | List II |
|-----------------|-----------------|
| A. Mutualism | I. + (A), O(B) |
| B. Commensalism | II. – (A), O(B) |
| C. Amensalism | III. +(A), –(B) |
| D. Parasitism | IV. +(A), +(B) |

Choose the correct answer from the options given below :

- [1] A-IV, B-III, C-I, D-II
[2] A-III, B-I, C-IV, D-II
[3] A-IV, B-II, C-I, D-III
[4] A-IV, B-I, C-II, D-III

[ANS] 4

[Q.147] Given below are two statements : One is labelled as Assertion A and the other is labelled as Reason R :

Assertion A : A flower is defined as modified shoot where in the shoot apical meristem changes to floral meristem.

Reason R : Internode of the shoot gets condensed to produce different floral appendages laterally at successive nodes instead of leaves.

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

- [1] A is true but R is false.
[2] A is false but R is true.
[3] Both A and R are true and R is the correct explanation of A.
[4] Both A and R are true but R is NOT the correct explanation of A.

[ANS] 3

[Q.148] Which one of the following statements is NOT correct ?

- [1] Water hyacinth grows abundantly in eutrophic water bodies and leads to an imbalance in the ecosystem dynamics of the water body.
- [2] The amount of some toxic substances of industrial waste water increases in the organisms at successive trophic levels.
- [3] The micro-organisms involved in biodegradation of organic matter in a sewage polluted water body consume a lot of oxygen causing the death of aquatic organisms.
- [4] Algal blooms caused by excess of organic matter in water improve water quality and promote fisheries.

[ANS] 4

[Q.149] Identify the correct statements:

- A. Lenticels are the lens-shaped openings permitting the exchange of gases.
- B. Bark formed early in the season is called hard bark.
- C. Bark is a technical term that refers to all tissues exterior to vascular cambium.
- D. Bark refers to periderm and secondary phloem.
- E. Phellogen is single-layered in thickness.

Choose the correct answer from the options given below:

- [1] A, B and D only
- [2] B and C only
- [3] B, C and E only
- [4] A and D only

[ANS] 4

[Q.150] Given below are two statements: One is labeled as Assertion A and the other is labeled as Reason R:

Assertion A: In gymnosperms the pollen grains are released from the microsporangium and carried by air currents.

Reason R: Air currents carry the pollen grains to the mouth of the archegonia where the male gametes are discharged and pollen tube is not formed.

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

- [1] A is true but R is false
- [2] A is false but R is true.
- [3] Both A and R are true and R is the correct explanation of A.
- [4] Both A and R are true but R is NOT the correct explanation of A.

[ANS] 4