Sample Paper-02

Dropper NEET (2024)

BOTANY

SECTION-A

1. Identify the **incorrect** statement.

(1) Gause's competitive exclusion principle may be true if resources are limiting, but not otherwise.

(2) Parasites evolved special adaptations such as low reproductive capacity, development of digestive system etc.

(3) Competition is best defined as a process in which the fitness of one species is significantly lower in the presence of another species.

(4) The Mediterranean orchid *Ophrys* employs 'sexual deceit' to get pollination done by a species of bee.

2. Unicellular root hairs arise from:

(1) Zone of elongation

(2) Zone of maturation

(3) Meristematic zone

(4) Root cap

3. **Statement I:** *Puccinia* lacks sex organs but proceeds sexual reproduction.

Statement II: *Puccinia* causes rust of wheat.

(1) Statement I and Statement II both are correct.

(2) Statement I is correct but Statement II is incorrect.

(3) Statement I is incorrect but Statement II is correct.

(4) Statement I and Statement II both are incorrect.

4. Match **List I** and **List II** and choose the **correct** option.

List-I		List-I	
I	Chemotaxonomy	A	used in plant taxonomy to resolve confusions
II	Numerical taxonomy	B	based on chromosome number
III	Cytotaxonomy	C	each character is given equal importance

(1) I-C, II-B, III-A (2) I-A, II-C, III-B

(3) I-A, II-B, III-C (4) I-C, II-A, III-B

5. A common test to find the genotype of hybrid is by;

(1) Crossing of F_2 progeny with male parent.

(2) Crossing of F_2 progeny with female parent.

(3) Crossing of F_1 progeny with dominant parent.

(4) Crossing of F_1 progeny with recessive parent.

6. **Assertion (A):** Two leaves arise at each node and lie opposite to each other in guava.

Reason (R): In guava flower, gynoecium is situated at the centre and other parts are located at the rim of thalamus.

(1) Both **Assertion (A)** and **Reason (R)** are true and **Reason (R)** is the correct explanation of **Assertion (A)**.

(2) Both **Assertion (A)** and **Reason (R)** are true but **Reason (R)** is not the correct explanation of **Assertion (A)**.

(3) **Assertion (A)** is true and **Reason (R)** is false.

(4) **Assertion (A)** is false and **Reason (R)** is true.

7. **Statement I:** In an ecosystem, abiotic factors include the living components.

Statement II: In an ecosystem biotic factors include the non-living components.

(1) Both Statement I and Statement II are correct.

(2) Statement I is correct but Statement II is incorrect.

(3) Statement I is incorrect but Statement II is correct.

(4) Both Statement I and Statement II are incorrect.

8. When NADH + H^+ and $FADH_2$ donate their electrons in the ETS, the protons move from;

(1) mitochondrial matrix to cytoplasm.

(2) mitochondrial matrix to intermembrane space.

(3) intermembrane space to mitochondrial msatrix.

(4) inner membrane to outer membrane.

9. **Assertion (A):** Only ATP is synthesized in stroma lamellae.
Reason (R): Stroma lamellae membranes lack P_{680} as well as NADP reductase enzyme.
(1) Both **Assertion (A)** and **Reason (R)** are true and **Reason (R)** is the correct explanation of **Assertion (A)**.
(2) Both **Assertion (A)** and **Reason (R)** are true but **Reason (R)** is not the correct explanation of **Assertion (A)**.
(3) **Assertion (A)** is true and **Reason (R)** is false.
(4) **Assertion (A)** is false and **Reason (R)** is true.

10. Polymorphism in DNA sequence is the basis of which of the following?
A. Genetic mapping of the human genome.
B. DNA fingerprinting.
C. Similarities among human beings.
(1) Only A (2) Only B
(3) Only A and B (4) Only B and C

11. Match List I with List II and select the **correct** option w.r.t bacterial cell.

List I		List II	
I.	Pili	A.	Helps in locomotion
II.	Mesosome	B.	Helps in adhesion and host invasion
III.	Flagella	C.	Helps to attach on rocks
IV.	Fimbriae	D.	Helps in ATP synthesis

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

12. **Statement I:** For knowing our bio-resources, taxonomical studies have to be done.
Statement II: Billions of plants & animals have been identified & described but a large number still remains unknown.
(1) Statement I and Statement II both are correct.
(2) Statement I is correct but Statement II is incorrect.
(3) Statement I is incorrect but Statement II is correct.
(4) Statement I and Statement II both are incorrect.

13. Match List I and List II and choose the **correct** option.

List I (Genes of *lac* operon)		List II (Function)	
I.	Operator	A.	Interacts with repressor protein
II.	Promoter	B.	Transcribes mRNA for polypeptide
III.	Structural	C.	Provides attachment site for RNA polymerase
IV.	Regulator	D.	Controls the activity of operator gene

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

14. Zygotene is characterized by how many of the following events?
A. Chromosomes start pairing.
B. Non-homologous chromosomes paired.
C. Synapsis occurs between homologous chromosomes.
D. Formation of synaptonemal complex in homologous chromosomes.
E. Formation of synaptonemal complex in non-homologous chromosomes.
(1) 5 (2) 2
(3) 3 (4) 4

15. **Assertion (A):** Secondary treatment of sewage is commonly referred to as physical treatment.
Reason (R): Secondary treatment of sewage involves usage of microbes.
(1) Both **Assertion (A)** and **Reason (R)** are true and **Reason (R)** is the correct explanation of **Assertion (A)**.
(2) Both **Assertion (A)** and **Reason (R)** are true but **Reason (R)** is not the correct explanation of **Assertion (A)**.
(3) **Assertion (A)** is true and **Reason (R)** is false.
(4) **Assertion (A)** is false and **Reason (R)** is true.

16. **Statement I:** The central cell of an embryo sac after triple fusion becomes the zygote and further develops into an embryo.
Statement II: The coconut water is nothing but free-nuclear endosperm and the surrounding white kernel is the cellular endosperm.
(1) Statement I and Statement II both are correct.
(2) Statement I is correct but Statement II is incorrect.
(3) Statement I is incorrect but Statement II is correct.
(4) Statement I and Statement II both are incorrect.

17. Identify the **incorrect** statement w.r.t ethylene.
(1) Synthesised in large amount in senescing tissues.
(2) Enhances respiration rate during ripening of fruits.
(3) Promotes rapid internode elongation in deep water sugarcane plants.
(4) Promotes formation of root hair.

18. Select the **wrongly** matched pair:
(1) Morgan – Coined the term linkage
(2) Sutton and Boveri - Chromosomal theory of inheritance
(3) R. C. Punnett - Checker board
(4) Mendel - X body & Y chromosome

19. The linkage map of X- chromosome of fruit fly has 66 map units, with yellow body gene (y) at one end and bobbed hair (b) gene at the other end. The recombination frequency between these two genes (y and b) should be,
(1) 66% (2) > 50%
(3) ≤ 50% (4) 100%

20. Regarding species diversity on earth, which of the following statements is **wrong**?
(1) Number of orchid species is less than the number of fungi species.
(2) Number of all the vertebrate species is more than the number of all insect species.
(3) Combined total of mammals, reptiles and amphibians species is less than that of fish species.
(4) Number of algal species is more than the number of ferns species.

21. A few statements are given below:
A. Much before the actual flower is seen on a plant, the decision that the plant is going to flower has taken place.
B. Stamens show large variation in size in nature.
C. A group of compactly arranged heterogenous cells occupies the centre of each microsporangium.
D. MMC and PMC undergo meiosis to produce male and female gametes, respectively.
The **incorrect** statements are:
(1) A and B (2) B and C
(3) C and D (4) A and C

22. Substrate level phosphorylation does not occur in which of the following reactions of aerobic respiration?
(1) 1, 3-BPGA → 3-PGA
(2) 3-PGA → 2-PGA
(3) PEP → Pyruvate
(4) Succinyl CoA → Succinic acid

23. A colourblind male marries to a normal female and they have their first child as colourblind female. What will be the genotype of the father and mother respectively?
(1) X^CY, XX (2) X^CY, X^CX^C
(3) XY, X^CX^C (4) XY, X^CX

24. Which of the following will be translated completely?
A. AUG, UGA, UUA, AAG, AAA
B. AUG, AUA, UUG, CCC, UGA
C. AGU, UCC, AGA, CUC, UAA
D. AUG, UAC, AGU, AAC, UAG
(1) A and B
(2) B and D
(3) A and D
(4) B and C

25. The floral formula $\oplus ♂ K_{2+2}C_4 A_{2+4}+\underline{G}_{(2)}$ is for family:
(1) Cruciferae
(2) Solanaceae
(3) Leguminaceae
(4) Malvaceae

26. Identify the **incorrect** statement:

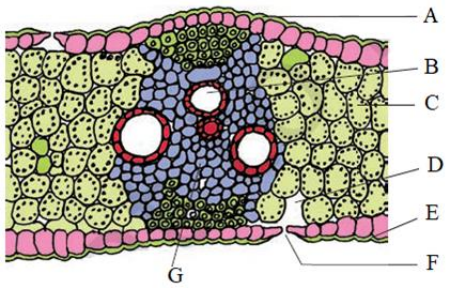
(1) Centrioles forms basal bodies of cilia or flagella.

(2) Centriole gives rise to spindle fibres at the time of cell division in animal cell.

(3) Centrosome is an organelle usually containing two cylindrical structures called centrioles.

(4) Both the centrioles in a centrosome lie parallel to each other in which each has an organisation like the cartwheel.

27. Observe the given diagram and read the given statements:



A. A is the upper epidermis (also called abaxial epidermis).

B. B is the chief water transporting structure.

C. G conducts food material.

D. C is the spongy parenchyma.

E. E consists of bulliform cells.

The **correct** statements are:

(1) A, D and E (2) A, B and C

(3) C, D and E (4) B and C

28. Select the **correct** statement from the following:

(1) Biogas, commonly called gobar gas is pure methane.

(2) Activated sludge sediment in settlement tanks of sewage treatment plant is a rich source of aerobic bacteria.

(3) Biogas is produced by the activity of aerobic bacteria on animal waste.

(4) *Methanobacterium* is an aerobic bacterium found in rumen of cattle.

29. Plant growth hormones extracted from a fungus and a fish, are respectively;

(1) Gibberellin and zeatin

(2) Ethylene and cytokinin

(3) Auxin and 2, 4-D

(4) Gibberellin and kinetin

30. **Assertion (A):** When *Streptococcus pneumoniae* (pneumococcus) bacteria are grown on a culture plate, some produce smooth shiny colonies (S) while others produce rough colonies (R).

Reason (R): The S strain bacteria have a mucous (polysaccharide) coat, while R strain does not.

(1) Both **Assertion (A)** and **Reason (R)** are the true, and **Reason (R)** is a correct explanation of **Assertion (A).**

(2) Both **Assertion (A)** and **Reason (R)** are the true, but **Reason (R)** is not a correct explanation of **Assertion (A)**.

(3) **Assertion (A)** is true, and **Reason (R)** is false.

(4) **Assertion (A)** is false, and **Reason (R)** is true.

31. Select the **wrong** statement from the following:

(1) Cell wall is present in members of kingdom fungi and plantae.

(2) Mushrooms belong to basidiomycetes.

(3) Pseudopodia are locomotory and feeding structures in sporozoans.

(4) Mitochondria are the powerhouse of the cell in all kingdoms except Monera.

32. Read the following statements and state them true (T) or false (F).

(A) In angiosperms, most of the pollen grains are shed at 3-celled stage.

(B) The outer hard layer of pollen is made up of sporopollenin.

(C) The pollen grain of members of Solanaceae family remain viable only for 30 minutes after their release.

(D) Pollen grains cannot be used as food supplement by humans.

	A	**B**	**C**	**D**
(1)	T	F	T	T
(2)	F	T	T	F
(3)	F	T	F	F
(4)	T	T	T	F

33. **Statement I:** Competition occurs only when closely related species compete for the same resources that are limiting.

Statement I: Goats do not browse on *Calotropis*.

(1) Statement I and Statement II both are correct.

(2) Statement I is correct but Statement II is incorrect.

(3) Statement I is incorrect but Statement II is correct.

(4) Statement I and Statement II both are incorrect.

34. **Statement I**: Leaf is a lateral outgrowth of stem developed endogenously at the node.
Statement II: Leaves exhibit marked variations in their shape, size, margin, apex and extent of incisions of lamina.
Select the **correct** option-
(1) Statement I and Statement II both are correct.
(2) Statement I is correct but Statement II is incorrect.
(3) Statement I is incorrect but Statement II is correct.
(4) Statement I and Statement II both are incorrect.

35. **Assertion (A):** As electrons move through the photosystems, protons are transported across the membrane.
Reason (R): The primary accepter of electron which is located towards the outer side of the membrane transfers its electron not to an electron carrier but to an H carrier.
(1) Both **Assertion (A)** and **Reason (R)** are the true, and **Reason (R)** is a correct explanation of **Assertion (A).**
(2) Both **Assertion (A)** and **Reason (R)** are the true, but **Reason (R)** is not a correct explanation of **Assertion (A)**.
(3) **Assertion (A)** is true, and **Reason (R)** is false.
(4) **Assertion (A)** is false, and **Reason (R)** is true.

SECTION-B

36. Read the four statements (A-D) given below:
(A) Ernst Mayr has been called the Darwin of the 20th century.
(B) One single maize root apical meristem can give rise to more than 17,500 new cells per day.
(C) Binomial nomenclature system was given by R.H. Whittaker.
(D) In unicellular organisms, reproduction is synonymous with growth.
The two **correct** statements are:
(1) A and D
(2) A and B
(3) B and C
(4) C and D

37. Match the **List-I** with **List-II** and select the **correct** option from the codes given below:

List-I		**List-II**	
I.	Schwann	A.	Observed that all plants are composed of different kinds of cells
II.	Palade	B.	Reported the presence of cell wall is a unique character of the plant cells
III.	Camillo	C.	Discovered the organelle containing chromatin
IV.	Schleiden	D.	Discovered organelles responsible for protein synthesis
V.	Robert Brown	E.	Discovered one of the organelles of the endomembrane system

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

38. Match the following lists and choose the **correct** option w.r.t biodiversity in the forests considered to be the 'lungs of the planet'

List I		**List II**	
I.	Plants	A.	3,000
II.	Fishes	B.	378
III.	Amphibians	C.	427
IV.	Reptiles	D.	40,000

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

39. **Assertion (A):** Despite occupying about 70 per cent of the surface, the productivity of the oceans are only 55 billion tons.
Reason (R): This is because the sunlight reaches only up to a limited depth and hence photosynthesis is also limited.
(1) Both **Assertion (A)** and **Reason (R)** are the true, and **Reason (R)** is a correct explanation of **Assertion (A).**
(2) Both **Assertion (A)** and **Reason (R)** are the true, but **Reason (R)** is not a correct explanation of **Assertion (A)**.
(3) **Assertion (A)** is true, and **Reason (R)** is false.
(4) **Assertion (A)** is false, and **Reason (R)** is true.

40. **Assertion (A):** In anaphase I, homologus chromosomes move to the opposite poles with both their chromatids.
Reason (R): In anaphase II the sister chromatids separate. Thus, at the end of meiosis four diploid cells are formed.
(1) Both **Assertion (A)** and **Reason (R)** are the true, and **Reason (R)** is a correct explanation of **Assertion (A).**
(2) Both **Assertion (A)** and **Reason (R)** are the true, but **Reason (R)** is not a correct explanation of **Assertion (A)**.
(3) **Assertion (A)** is true, and **Reason (R)** is false.
(4) **Assertion (A)** is false, and **Reason (R)** is true.

41. **Statement-I:** Conservation in the natural habitat is called in situ conservation
Statement-II: Botanical garden is an example of In situ conservation
(1) Both statement I and II are correct.
(2) Statement I is correct but statement II is incorrect.
(3) Statement I is incorrect but statement II is correct.
(4) Both statement I and II are incorrect.

42. **Assertion (A):** The decomposition rate of lignin and chitin is slow in colder climates.
Reason (R): The rate of decomposition is controlled by chemical and climatic factors.
(1) Both **Assertion (A)** and **Reason (R)** are the true, and **Reason (R)** is a correct explanation of **Assertion (A).**
(2) Both **Assertion (A)** and **Reason (R)** are the true, but **Reason (R)** is not a correct explanation of **Assertion (A)**.
(3) **Assertion (A)** is true, and **Reason (R)** is false.
(4) **Assertion (A)** is false, and **Reason (R)** is true.

43. The annual net primary productivity of land is about
(1) 170 billion tons
(2) 70 billion tons
(3) 55 billion tons
(4) 115 billion tons

44. Which of the following statements are not correct ?
(i) Lower the taxon, more are the characteristics that the members within the taxon share.
(ii) Order is the assemblage of genera which exhibit a few similar characters.
(iii) Cat and dog are included in the same family Felidae.
(iv) Binomial nomenclature was introduced by Carolus Linnaeus.
(1) (i), (ii) and (iii)
(2) (ii), (iii) and (iv)
(3) (i) and (iv)
(4) (ii) and (iii)

45. Select the mismatched pair;
(1) Gibberellic acid – Increases yield of sugarcane
(2) Cytokinin – Promotes apical dominance
(3) Ethylene – Sprouting of potato tuber
(4) Abscisic acid – Inhibits seed germination

46. Similarity in Trichome and Root hair is;
(1) Epidermal outgrowth
(2) Unbranched
(3) Prevent Transpiration
(4) Secretory

47. In Kranz anatomy, the bundle sheath cells have:
(1) Thick walls, no intercellular spaces and large number of chloroplasts
(2) Thin walls, no intercellular spaces and several chloroplasts
(3) Thick walls, many intercellular spaces and few chloroplasts
(4) Thin walls, many intercellular spaces and no chloroplasts.

48. **Assertion (A):** Autogamy is pollination taking place or limited to the same flower.
Reason (R): Xenogamy is pollination between two flowers on different plants.
(1) Both Assertion and Reason are correct and Reason is the correct explanation for Assertion.
(2) Both Assertion and Reason are correct but Reason is not the correct explanation for Assertion
(3) Assertion is correct but Reason is incorrect
(4) Both Assertion and Reason are incorrect

49. Thalassemia and sickle cell anemia are caused due to a problem in globin molecule synthesis. Select the **correct** statement.

(1) Both are due to a qualitative defect in globin chain synthesis

(2) Thalassemia is due to less synthesis of globin molecules

(3) Sickle cell anemia is due to a quantitative problem of globin molecules

(4) Both are due to a quantitative defect in globin chain synthesis

50. **Statement-I:** 3 out of 64 genetic codes do not code for any amino acids.

Statement-II: Non-sense codons have no information about any amino acids.

(1) Both statement I and II are correct.

(2) Statement I is correct but statement II is incorrect.

(3) Statement I is incorrect but statement II is correct.

(4) Both statement I and II are incorrect.