2025

BIOLOGY

(Theory)

Full Marks : 70

Pass Marks : 21

Time : Three hours

All the questions are compulsory.

The figures in the right margin indicate full marks for the questions.

For Question Nos. 1 to 8 select most appropriate one from the given alternatives A, B, C and D and rewrite the same.

1. Systema Naturae was published by – 1

(A) Linnaeus (B) Aristotle

(C) Lamarck (D) Whittaker

2. Which one of the following has a conjoint and closed type of vascular bundle? 1

(A) Dicot stem (B) Monocot stem

(C) Dicot root (D) Monocot root

3. The endoplasmic reticulum is in continuation with – 1

(A) Golgi body (B) Nuclear membrane

(C) Mitochondria (D) Chloroplast

4. Deuteromycetes are commonly known as imperfect fungi because – 1

(A) Both asexual and sexual phases are known

(B) Only sexual phase is known

(C) Only asexual or vegetative phases are known

(D) Both sexual and vegetative phases are known

5. Mustard flowers are considered as hypogynous flowers because the ovaries are said to be – 1

(A) Superior (B) Inferior

(C) Half–inferior (D) Half–superior

6. The cytokinesis in plant cells differ from that of animal cells in the formation of – 1

(A) Cell furrow (B) Cell inclusion

(C) Cell cytoplasm (D) Cell plate

7. C_4 plants have greater productivity of biomass than C_3 plants because – 1

(A) High photorespiration (B) Lack of photorespiration

(C) High photo-oxidation (D) Low photophosphorylation

8. Gout is caused due to accumulation of – 1

(A) Oxalic acid (B) Calcium carbonate

(C) Uric acid (D) Lactic acid

Question Nos. 9 and 10 consist of two statements each, printed as Assertion and Reason. While answering these questions, select the most appropriate one from the given aternatives A, B , C and D and rewrite the same :

(A) If both Assertion and Reason are true and Reason is a correct explanation of the Assertion.

(B) If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion.

(C) If Assertion is true but Reason is false.

(D) If both Assertion and Reason are false.

9. Assertion : In reticulate venation , veinlets are repeatedly branched and form a complex network.

Reason : In parallel venation , the veins run parallel to each other within a lamina. 1

10. Assertion : In C_4 plants ,end product of CO_2 fixation is oxalo-acetic acid.

Reason : Oxalo-acetic acid is formed in bundle sheath chloroplasts. 1

Question Nos. 11 to 17 are very short answer type questions carrying 1 mark each :

11 What is scutellum? 1

12. Name the components of a nucleoside. 1

13. How does gaseous exchange take place during aestivation and hibernation in frogs? 1

14. Give one difference between primary metabolites and secondary metabolites. 1

15. Why is the concentration of CO_2 in the atmosphere considered to be a limiting factor for C_3 plants? 1

16. " Cymose inflorescense has limited growth". Comment. 1

17. What would happen if there was no proton gradient across the thylakoid membrane in chloroplast ? 1

Question Nos. 18 to 27 are short answer type-II questions carrying 2 marks each :

18. What are trichomes ? Mention its function. 1+1=2

19. Why are the spread of living pteridophytes limited and restricted to narrow geographical region ? 2

20. Give two points of difference between palisade and spongy parenchyma. 2

21. Why is interphase the most important phase of the cell cycle? 2

22. Differentiate between ammonotelism and ureotelism by giving two points. 2

23. "Frogs exhibit sexual dimorphism". Justify the statement by giving two points. 2

24. "The concentration of ions is higher inside the vacuole than in the cytoplasm of plant cells". Give reason. 2

25. What will happen if pituitary gland is removed from the human body? Write two points. 2

26. Draw a neat diagram of a sectional view of chloroplast and label granum. 2

27. Draw a neat diagram of a nephron and label Henle's loop. 2

Question Nos. 28 to 33 are short answer type–I questions carrying 3 marks each :

28. List the characteristics of the three phases in the sigmoid growth curve. 3

29 Why are the mammals considered as the most advanced of all animals ? Give three points. 3

30. Differentiate between fermentation and aerobic respiration by giving three points . 3

31. How does the condition of erythroblastosis foetalis occur in a new born baby? 3

Or

How are respiratory gases transported in human blood ? Give three points.

32. "The respiratory pathway is an amphibolic pathway". Justify. 3

Or

"Both growth and differentiation in higher plants are open". Justify.

Question No. 33 is a case study based question carrying three marks :

33. An old woman is admitted to the hospital for a routine surgery . Her medical history reveals that she has blood group , B-negative. The hospital's blood bank has only A-positive and O-positive blood units available. She requires a blood transfusion during surgery.

Questions :

(a) State the potential risks of transfusing A-positive blood into the old woman. 1

(b) What alternative options are available to the medical team to ensure compatible blood transfusion for the old woman? Wrtie two points. 2

Or

A patient is complaining of frequent urination , excessive thirst, hunger and tiredness. On examination his fasting blood sugar level is found higher than 130 mg/dL on two occasions. He also experiences fatigue and abdominal pain.

Questions :

(a) State the main cause of the patient's worsening symptoms. 1

(b) What treatment options would you recommend for the patient ? 2

Write two points.

Questions Nos. 34 to 36 are essay type questions carrying five marks each :

34. Differentiate between prokaryotic and eukaryotic cells by giving five points. 5

Or

Distinguish between mitosis and meiosis by giving five points.

35. Explain the role of renal corpuscle and renal tubule in the formation of urine in humans. 5

Or

Explain the mechanism of sliding filament theory of muscle contraction.

36. "Abscisic acid acts as an antagonist to gibberellins". Analyse. 5

Or

" RuBisCO is an enzyme that acts both carboxylase and oxygenase". Analyse.