DEPARTMENT OF SCHOOL EDUCATION (PRE-UNIVRSITY)
MODEL QUESTION PAPER (2024-25)
I PU SUBJECT-BIOLOGY

Duration: 3hr **Max Marks: 70**

General instructions:

This Question Paper consist of four parts A, B, C, D, E.

Part –A consists of I and II and Part D consists of V and VI.

All the parts are compulsory.

The answers for Part-A written in the first two pages of the answer booklet are only considered for evaluation.

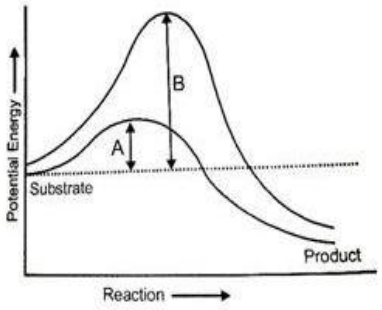
Part –E consists of questions for visually challenged students only.

PART-A

I. Select the correct alternative from the choices given below: **15×1=15**

1. In Hierarchial classification, order is placed between.
   a. Kingdom and phylum
   b. Genus and family
   c. Family and class
   d. Class and phylum
2. Which of the following is the correct sequence of class → Mycelium → fruiting body observed in the kingdom fungi ?
   a. Phycomycetes → septate, coencocytic → Not present
   b. Ascomycets → Aesptate and branched → Ascocarp
   c. Basidomycetes → Aseptate and branched → Basidocorp
   d. Deuteromycetes →Septate and branched → not present
3. Which of the following belong to class osteichthyes ?
   i. Scoliodon ii. Exocetus iii. Hippocampus iv. Carcharodon v. Clarias
   a) i.iii.iv b) ii.iii,v. c) ii,iii,iv d) i.iv.v
4. Read the statements with regard to types study of frog, and select the correct answer from below given options.
   i. Vasa efferentia are 10-12 in number that arise from testes
   ii. The medulla oblongata passes out through foramen magnum and continues as spinal cord.
   iii. Frogs are uricotelic
   iv. Ovaries have no functional connection with kedneys
   a. Statement ii and iii are correct, while statement i and iv are incorrect
   b. Statement i and iv are correct, while statement ii and iii are incorrect.
   c. Statement i, ii, and iii are correct while statement iv is incorrect
   d. Statement i, ii and iv are correct while statement iii is incorrect.

5. Which of the following given options describes the graph correctly?



   a. Endothermic reaction with energy – A in the presence of enzyme and B in the absence of enzyme.
   b. Exothermic reaction with energy – A in the presence of enzyme and B in the absence of enzyme.
   c. Endothermic reaction with energy – A in the absence of enzyme and B in the presence of enzyme.
   d. Exothermic reaction with energy –A in the absence of enzyme and B in the presence of enzyme.

6. Identify the sub stages of Prophase –I with respect to the given features

   I. Thin thread chromosomes with a beaded appearance.

   II. Appearance of recombination nodules

   III. Formation of bivalents /tetrads

   IV. Terminalisation of chiasmata

   V. Appearance of chiasmata

   And select the correct option below

   a. I- leptotene, II- Zygotene, III- pachytene
      IV-diplotene, V-Diakinesis
   b. I- leptotene, II- zygotene, III-Pachytene
      IV- Diakinesis, V- Diplotene
   c. I- leptotene, II- Pachytene, III- Zygotene
      IV- Diakinesis V- Diplotene
   d. I- leptotene, II- Pachytene, III- Diplotene
      IV- Zygotene, V- Diakinesis.

7. ATP and NADPH produced in light reaction of photosynthesis by the movement of electrons in ETC are used immediately for.
   a. Oxidation of carbohydrate
   b. Synthesis of sugar in biosynthetic phase
   c. Reduction of carbon dioxide
   d. Both (b) and (c)

8. Refer the given equation

$2\ (C_{51}H_{98}O_6) + 145O_2 \rightarrow 102\ Co_2 + 98H_2O + Energy$

The respiratory quotient in this case is

a) 1 b) 0.7 c) 1.45 d) 1.62

9. Efficiency index in the geometrical growth is the ability to produce.

a) Cell wall. b) New enzyme.

c) New plant material. d) Young ones through mitosis.

10. During expiration process of breathing.

a) Thoracic volume increase and diaphragm contracts.

b) Intrapulmonary pressure increase above the atmospheric pressure.

c) Sternum is present at normal position.

d) Both b and c

11. Arrange the given steps of human respiration in the sequence they occur

I. Diffusion of gases O_2 and CO_2 across the alveolar membrane.

II. Transport of gases by the blood.

III. Utilisation of O_2 by the cells for catabolic reactions and the resultant release of CO_2.

IV. Pulmonary ventilation by which atmospheric air is drawn in and CO_2 rich alveolar air is released out.

V. Diffusion of O_2 and CO_2 between the blood & tissue.

Choose the correct option

a. IV→ I→ II→ V→ III c) V → IV→ III→ II→ I

b. III → II→ V→ I→ IV d) I→ III→ IV→ →II→ V

12. Match the following column I with column II

Column I (Heart vessels)	Column II (Functions)
A. Superior vena cava	1. Carries oxygenated blood
B. Inferior Vena Cava	2. Carries deoxygenated blood
C. Pulmonary Artery	3. Brings deoxygenated blood from lower part of body to right atrium.
D. Pulmonary vein	4. Brings deoxygenated blood from upper part of the body to right atrium.

Select the correct options.

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

13) Choose the mismatched part of nephron with its functions

a) Bowman's capsule-Glomerular filtration

b) PCT – Reabsorption of Na^+ and K^+

c) DCT - Reabsorption of glucose

d) Loop of Henle – Urine concentration

14) Select the correct statement regarding the specific disorder of muscular or skeletal system.

a) Muscular dystrophy – Age related shortening of muscles.

b) Osteoporosis – Decrease in bone mass and higher chances of fractures with advancing age.

c) Myasthenia gravis – Autoimmune disorder which inhibits sliding of myosin filaments.

d) Gout – Inflammation of joints due to extra deposition of calcium.

15) The system that transimits impules from the CNS to the involuntary organs and smooth muscles of the body

(a) Sympathetic neural system

(b) Parasympathetic neural system

c) somatic neural system

d) Autonomic neural system

II. Fill in the blanks by choosing the appropriate word / words from those given below; $5 \times 1 = 5$

[Casparian strips, Medulla, Melatonin, Nitrogenous wastes, Differentiation, Redifferentiation]

16) In dicot root the endodermal cells have a deposition of water impermeable, waxy material suberin in the form of _____.

17) The process when dedifferentiated cells again lose the ability to divide and get mature is known as _____

18) Respiratory rhythm is maintained by the respiratory centre in the _____ region of the brain.

19) Dialysis fluid contains all the constituents as in plasma except_____.

20) _____ helps in maintaining the normal rhythms of sleep-wake cycle, body temperature in our body.

PART-B

III. Answer any five of the following questions in 3-5 sentences wherever applicable; $5 \times 2 = 10$

21) What are the advantages of giving scientific names to the organisms?

22) Name the animals exhibiting the below given characters.

a. Organism with sucking and circular mouth .

b. Organism in which notochord is present only in larval tail.

23) Frogs can live both on land and in freshwater. Write a note on respiratory system found in frog to survive in both the habitats.

24) Identify the cellular structures with the help of the following features.

a. Are the sites of aerobic respiration.

b. It destroys foreign substances .

c. It gives turgidity to the plant cells.

d. It initiates and regulates cell division.

25) Why is interphase of cell cycle called resting phase?

26) Abscisic acid is also known as 'stress hormone'. Give reason.

27) Define ; a) Tidal Volume b) Residual Volume

PART-C

IV. Answer any five of the following questions in 40-80 sentences wherever applicable; 5×3=15

28) Write the stored food present in different classes of algae.

29) The tissue between the upper and lower epidermis of a leaf is called mesophyll.

a. Write the type of cells found in this tissue in a dicot leaf. (1m)

b. Mention any two anatomical differences between a dicot leaf and monocot leaf. (2m)

30) Draw and label the parts of an organelle responsible for trapping light energy essential for photosynthesis in plants.

31) Plant cell undergo cytokinesis by a different mechanism than in animal cell, substantiate.

32) Write the characteristics of plant growth regulators (PGRs).

33) Draw a neat labeled diagram of nephron.

34) Briefly explain chemical transmission of Impulses.

PART-D

V. Answer any four of the following questions in about 200-250 words each wherever applicable; 4×5=20

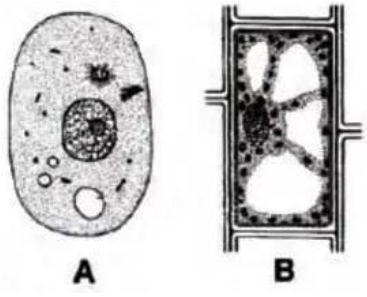
35) Enumerate the salient feature of Pteridophytes.

36) a) List two classes of chordates which are oviparous and the development is direct (2m)

b) Mammals are the highly evolved among animals, write any six distinguishing features of them. (3m)

37) Write the floral characters and floral formula of family Solanaceae.

38) Given below are the sketches of cell A and cell B.



(a) Which one of these is a plant cell?
Give reason in support of your answer. (1m)

(b) List the cell structures which are common to both the cell types. (2m)

(c) Name the structures found only in animal cells. (2m)

39) Give the schematic representation of Glycolysis.

40) Joints are essential for all types of movements involving the bony part of the body. Based on this mention the types and there location in human body.

41) Suma is afraid of spiders. On sudden encounter with this six legged animal, she experienced fright and flight emergency condition. Based on this, answer the following questions.

(a) Name the hormones secreted in response to this emergency condition. (1m)

(b) Name the source gland of these hormones and its location. (2m)

(c) Describe the effect of these hormones on circulatory and respiratory system of Suma. (2m)

VI. Answer any one of the following question in about 200-250 words each, wherever applicable: 1x5=5

42) Give reasons;

a) Both starch and cellulose are polysaccharides but iodine gives colour test with starch and not with cellulose.

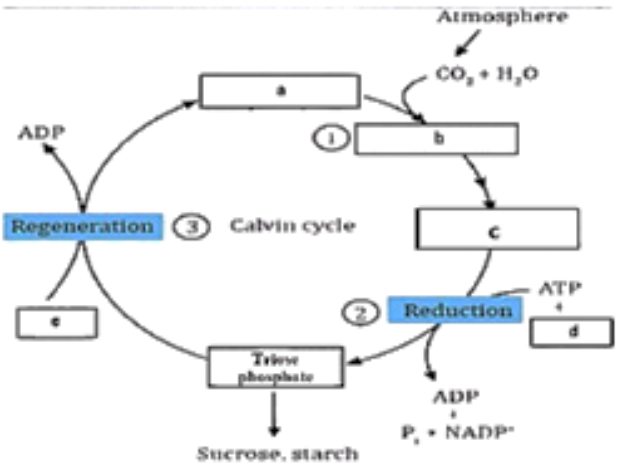
b) Proteins are called heteropolymers.

c) Presence of malonate inhibits the activity of succinate dehydrogenase enzyme.

d) Why do lipids, whose molecular weights do not exceed 800 Da, come under acid insoluble fraction i.e., macromolecular fraction?

e) In solutions of different p^H, the structure of amino acids changes.

43) Study the schematic representation of Calvin cycle and answer the question that follows.



(a) Which is the primary CO_2 acceptor?

(b) Name the enzyme required for carboxylation.

(c) Name the compound formed form the carboxylation.

(d) How many NADPH molecules are required for synthesis of one glucose molecule in reduction stage?

(e) How many ATP molecule are required for to form RuBP during regeneration?

44) A heart patient underwent an ECG, in his ECG report, time period between QRS complex was more than the normal. Based on this, answer the following questions

a) Mention whether his heart rate is high or low than the normal. (1m)

b) Give suitable explanation for your interpretation (1m)

c) What is the importance of QRS complex with respect to electrical activity of heart? (1m)

d) What does P&T waves represent in ECG (2m)

PART – E

(FOR VISUALLY CHALLENGED STUDENTS ONLY)

5) When the binding of the chemical shuts off enzyme activity, the process and the chemical are respectively called as

a) Inhibition, inhibitor
b) Competition, substrate
c) Initation, promoter
d) Inhibition, substrate

38) Explain the structure of Nucleus.

43) Give an account of the Calvin cycle.