

ARMY PUBLIC SCHOOL SHILLONG
ANNUAL EXAMINATION 2022-23
CLASS: XISC
SUBJECT: BIOLOGY

Time: 3 Hours

Maximum Marks: 70

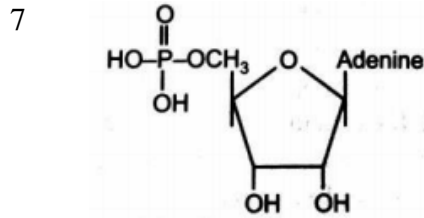
General Instructions:

- (i) All questions are compulsory.
- (ii) The question paper has five sections and 33 questions.
- (iii) Section–A has 16 questions of 1 mark each; Section–B has 5 questions of 2 marks each; Section– C has 7 questions of 3 marks each; Section– D has 2 case-based questions of 4 marks each; and Section–E has 3 questions of 5 marks each.
- (iv) There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.
- (v) Wherever necessary, neat and properly labelled diagrams should be drawn.

SECTION – A

- | | | |
|---|--|---|
| 1 | Conjoint and closed vascular bundles are found in:
(a) Monocot stem
(b) Monocot root
(c) Dicot stem
(d) Dicot root | 1 |
| 2 | Which of the following characteristic is common both in humans and adult frogs?
(a) Internal fertilization
(b) Nucleated RBCs
(c) Four-chambered heart
(d) Ureotelic mode of excretion | 1 |
| 3 | Apical dominance means:
(a) Stimulation of growth of apical bud by removal of axillary buds
(b) Suppression of growth of apical bud by axillary buds
(c) Suppression of growth of axillary buds by the presence of apical bud
(d) Inhibition of growth of axillary buds by the removal of apical bud | 1 |
| 4 | Bryophytes are also called amphibians of the plant kingdom because:
(a) Plants can live in soil but are dependent on water for sexual reproduction
(b) They play an important role in plant succession on bare rocks/soil
(c) They usually occur in damp, humid and shaded localities
(d) All of these | 1 |
| 5 | In a child of 15 years of age, plasma calcium level is diagnosed below optimum level. Which organ is malfunctioning?
(a) Posterior lobe of pituitary
(b) Parathyroid
(c) Thyroid gland
(d) Liver | 1 |

- 6 Which among the following is not a genus? 1
- (a) Solanum
 (b) Felis
 (c) indica
 (d) Homo



- The given structural formula represents 1
- (a) adenine
 (b) adenosine
 (c) guanine
 (d) adenylic acid

- 8 Read the following statements and identify the group of organisms, the mentioned characters belong to 1
- (i) Unicellular, colonial, filamentous aquatic or terrestrial
 (ii) The colonies are more often surrounded by a gelatinous sheath.
 (iii) Some can fix atmospheric nitrogen.
 (iv) They often form blooms in polluted water.
- (a) Dinoflagellates
 (b) Cyanobacteria
 (c) Archaeobacteria
 (d) Chrysophytes

- 9 *Sycon* belongs to a group of animals, which are best described as: 1
- (a) multicellular with a gastrovascular cavity
 (b) multicellular, acoelomate with tissue organisation
 (c) multicellular with no tissue organisation
 (d) multicellular with organ level of organisation

- 10 In a longitudinal section of root tip, starting from tip upwards are the regions of 1
- (a) meristem, root cap, cell enlargement, cell maturation
 (b) cell maturation, cell enlargement, meristem, root cap
 (c) cell enlargement, cell maturation, root cap, meristem
 (d) root cap, meristem, cell enlargement, cell maturation

- 11 Juxtaglomerular apparatus is a sensitive region formed by cellular modifications in the 1
- (a) PCT and afferent arteriole
 (b) PCT and efferent arteriole
 (c) DCT and afferent arteriole
 (d) DCT and efferent arteriole

- 12 Chemiosmotic hypothesis of ATP synthesis in chloroplasts is based on 1
- (a) accumulation of Na^+ ions in the thylakoids
 (b) proton gradient between thylakoid lumen and stroma

- (c) accumulation of K^+ ions in the thylakoids
- (d) Membrane potential

Question No. 13 to 16 consist of two statements – Assertion (A) and Reason (R).

Answer these questions selecting the appropriate option given below:

Both A and R are true and R is the correct explanation of A.

Both A and R are true and R is not the correct explanation of A.

A is true but R is false.

A is False but R is true.

- 13 **Assertion:** In China-rose, the stamens are described as monadelphous.
Reason: In China-rose, there are numerous stamens and the filaments of all the stamens are united into one bundle. 1
- 14 **Assertion:** Animals of the phylum Platyhelminthes are called ‘flatworms’ also.
Reason: Animals of the phylum Aschelminthes are called ‘roundworms’ too. 1
- 15 **Assertion:** The filtrate becomes hypotonic in the ascending limb of Henle’s loop.
Reason: The ascending limb of Henle’s loop is impermeable to water but is permeable to solutes. 1
- 16 **Assertion:** Scientific names of organisms are in Latin. They are Latinised or derived from Latin.
Reason: Latin is widely used and has not changed much with time. 1

SECTION – B

- 17 Suppose there were plants that had a high concentration of chlorophyll b but lacked chlorophyll a, would it carry out photosynthesis? Then why do plants have chlorophyll b and other accessory pigments? 2
- OR**
- A type of anatomy of leaves possessed by C_4 - plants is different from those of C_3 -plants. Explain. Mention the advantage of such anatomy of leaves of C_4 plants.
- 18 Succinic dehydrogenase is an enzyme that causes the substrate, succinate to breakdown into fumarate. Malonate is a substance that resembles succinate and inhibits the activity of succinic dehydrogenase. 2
- (a) State the type of inhibition of succinic dehydrogenase by malonate.
(b) Explain how this type of inhibition affects the activity of the enzyme.
- 19 One of the ABO blood groups is called the universal donor. Which group do you think it is and why? 2
- 20 How is five-kingdom classification advantageous over the two-kingdom classification? 2
- 21 Answer the following with reference to the anatomy of a dicot root: 2
- (a) Where is pericycle located?
(b) How are xylem vessels arranged? What is such an arrangement called?
(c) Mention the importance of casparian strips.

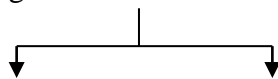
SECTION – C

- 22 The steps in the chemical analysis of a living tissue sample are shown below. Fill in the blanks A, B, C, D, E and F. 3

The tissue sample is ground in A (name the chemical) using a pestle and mortar.



The slurry is filtered through a cheese cloth.



Filtrate or acid-soluble fraction contains compounds with molecular weight B

Acid-insoluble fraction contains 4 types of organic compounds namely, C, D, E and F.

OR

- (a) Identify the figure given below.
(b) Name the class to which it belong and give one more example for the class.
(c) Mention the characteristics of the class.



- 23 Name and draw the stage of cell division at which the following events occur: 3
(a) Chromosomes are moved to the spindle equator
(b) Centromere splits and chromatids separate
(c) Paring between homologous chromosomes
- 24 What are endomembrane system? Explain the functions of any two organelles associated with endomembrane system. 3
- 25 Mammals and birds (Aves) are vertebrates and homotherms. They show double circulation but differ in many other aspects. 3
(a) Mention any two adaptations/ modifications, a bird have for its aerial mode of life.
(b) Mention any four differences between Aves and mammals.
- 26 Draw a floral diagram and write floral formula of a hypogynous flower which has bract, 4 united sepals with valvate aestivation, 4 united petals with twisted aestivation, epipetalous condition having 4 stamens with bicarpellary ovary. 3
- 27 Name the categories of plant hormones concerned with each of the following and describe one other function of each of the three categories of plant hormones: 3
(a) Inhibition of seed germination
(b) Promote flowering

- (c) Ripening of fruits
- 28 Sara has blood group B-ve and her husband's blood group is O+ve. Their first child has blood group B+ve. Her second child was born with severe anaemia and jaundice. 3
- (a) What could be the reason for the condition of second child?
- (b) How this condition could have been avoided?

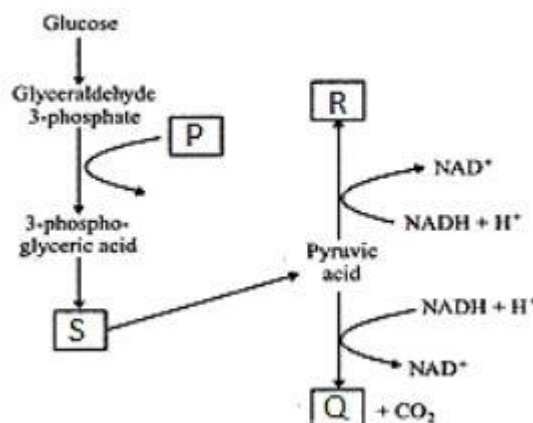
SECTION – D

Read the following passages and answer the questions that follow:

- 29 On an educational trip to Uttranchal, Amita and her friends observed that many local people were having a swelling in their neck. Help Amita and her friends to find out the solution to the following questions. 4
- (a) Which probable disease are these local people suffering from?
- (b) What is the cause of the disease?
- (c) What is the effect of this condition on pregnancy?
- (d) What is exophthalmic goitre?
- (e) Name the hormones referred to as T₃ and T₄ respectively.
- 30 Meiosis is the specialised type of cell division that reduces the chromosome number to half in the daughter cells. Meiosis ensures the production of haploid phase in the sexually reproducing organisms. Meiosis occurs in two stages, Meiosis I and Meiosis II, where the former is the reduction division and the latter the equational division. 4
- (a) Name the sub-stages of Prophase I in correct sequence.
- (b) What marks pachytene of Prophase I?
- (c) Which stage is characterised by the formation of synaptonemal complex and its dissolution respectively?
- (d) When does actual reduction in the number of chromosomes to half occur during meiosis? Why?

SECTION – E

- 31 In the following flow chart, replace the P, Q, R and S with appropriate terms. 5
- Briefly explain the process and give any one application of it.

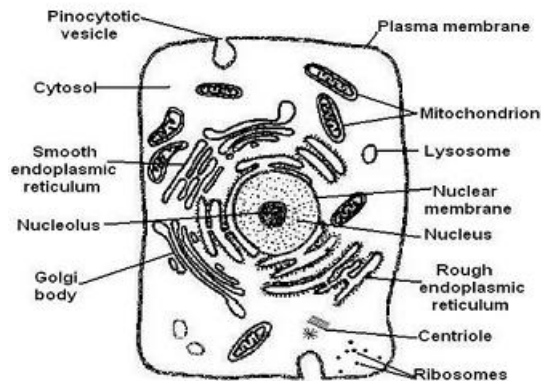


OR

Where does non-cyclic photophosphorylation take place? Represent this process. Why is this process called so?

32 The diagram shows some of the structures present in an animal cell.

5



Which of the structure is responsible for:

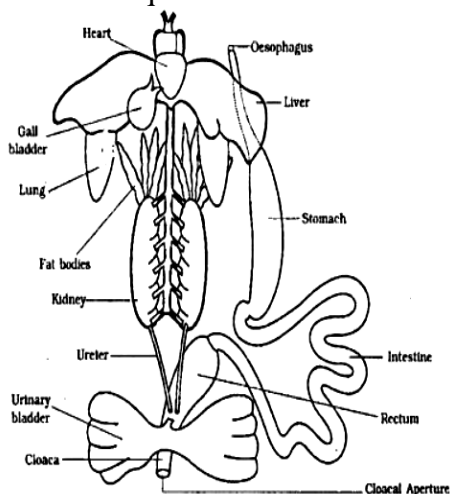
- (a) manufacture of lipids and steroids
- (b) release of energy
- (c) manufacture of proteins
- (d) production of spindle fibres in cell division. Also, draw and label the electron microscopic section.

OR

Explain the various factors which affect enzyme action. Explain a condition when activation energy required is less.

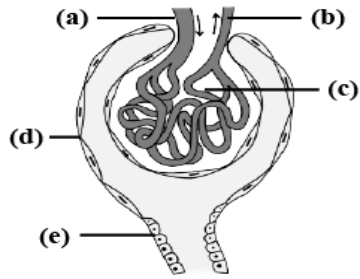
33 The diagram of the digestive system of frog is shown. Observe the diagram and answer the questions that follow:

5



- (a) Name the two accessory digestive glands in frogs.
- (b) How is digestion aided in the stomach and intestine?
- (c) How is the absorption of digestive food aided in the intestine?

OR



A diagram of a malpighian body (Renal corpuscle) is given above. Answer the following questions.

- (a) Name the blood vessels labelled 'a' and 'b'. Which of them has the least and maximum amount of urea respectively?
- (b) Identify and name the parts that collectively form the renal corpuscle.
- (c) What are peritubular capillaries?
- (d) Name the part 'e'. Mention its function.

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