



ANNUAL EXAMINATION 2024-25
BIOLOGY (044)

Class: XI
Date: /02/2025

Duration: 3 Hr
Max. Marks: 70

General Instructions:

- (i) All questions are compulsory.
- (ii) The question paper has five sections and 33 questions. All questions are compulsory.
- (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. Identify the correct family to which *Homo sapiens* belongs to? 1
 - a) Muscidae
 - b) Poaceae
 - c) Hominidae
 - d) Sapiens
2. Why do mosses and ferns are found in moist and shady places? 1
 - a) They do not need sunlight for photosynthesis.
 - b) They are dependent for their nutrition on microorganisms, which can survive only at low temperatures.
 - c) They cannot compete with sun-loving plants.
 - d) They require presence of water for fertilization.
3. Fusion of two gametes dissimilar in size, is termed as: 1
 - a) zoospores
 - b) isogamous
 - c) anisogamous
 - d) flagellated
4. Match the following (column I with column II) 1

Column I	Column II
a) chlamydomonas	i) Moss
b) Cycas	ii) Pteridophyte
c) Selaginella	iii) Algae
d) Sphagnum	iv) Gymnosperm
5. The ciliated columnar epithelial cells in humans are known to occur in: 1
 - a) Nephrons and stomach lining
 - b) Bronchioles and fallopian tube
 - c) Bile duct and oesophagus
 - d) Fallopian tube and urethra
6. New cells generate from 1
 - a) bacterial fermentation
 - b) regeneration of old cells
 - c) pre-existing cells
 - d) abiotic materials
7. Which one is an example of competitive inhibition? 1
 - a) Cyanide action on cytochrome
 - b) Sulpha drug on folic acid synthesis in bacteria
 - c) Allosteric inhibition of hexokinase by glucose 6- phosphate
 - d) Reaction between succinic dehydrogenase and succinate.
8. Select the correct statement about G1 phase. 1
 - a) Cell is metabolically inactive
 - b) It is not a phase of synthesis of macromolecules
 - c) DNA in the cell does not replicate

- d) Cell stops growing
9. Kranz type of anatomy is found in leaves of: 1
 a) C2 plants b) C3 Plants c) C4 Plants d) Succulents
10. Mitochondria are called powerhouses of the cell. Which of the following observations support the statement? 1
 a) Mitochondria have a double membrane.
 b) Mitochondria synthesise ATP.
 c) The enzymes of the Krebs cycle and the cytochromes are found in mitochondria.
 d) Mitochondria are found in almost all plants and animal cells.
11. The most common species of frog in India is 1
 a) *Rana tigris*.
 b) *Rana tigrina*.
 c) *Musca indica*
 d) *Rana indica*
12. Bioluminescence is shown by the following phylum: 1
 a) Platyhelminthes
 b) Ctenophora
 c) Porifera
 d) Chordata
- Question No. 13 to 16 consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:
 A. Both A and R are true and R is the correct explanation of A.
 B. Both A and R are true and R is not the correct explanation of A.
 C. A is true but R is false.
 D. A is False but R is true.
13. Assertion: Aerobic respiration is bioenergetically more efficient than anaerobic respiration. 1
 Reason: Aerobic respiration takes place in mitochondria, whereas anaerobic respiration occurs in the cytoplasm.
14. Assertion: *Mangifera indica* and *Solanum tuberosum* belongs to the same kingdom. 1
 Reason: All kingdoms have species as the lowest category.
15. Assertion: Gemmae are green, multicellular, asexual buds which are located on the thalli. 1
 Reason: The pteridophytes are the first terrestrial plants possess vascular tissues.
16. Assertion: Ribosomes are non-membrane bound organelles found in the prokaryotic cells only. 1
 Reason: They help in protein synthesis.
- SECTION – B**
17. Write a short note on the Pancreas as a composite gland. 2
 OR
 What is role of thymus gland in immunity?
18. Explain the auto-regulatory mechanism of GFR. 2
19. What are the major transport mechanisms for CO₂? Explain. 2
20. Describe briefly the sigmoid growth curve. 2
21. Define the following terms: 2
 a) Quiescent stage
 b) Bivalent
- SECTION – C**
22. Differentiate between: 3
 a) C3 and C4 pathways
 b) Cyclic and non-cyclic photophosphorylation.
 c) Anatomy of leaf in C3 and C4 plants
23. What is a mesosome in a prokaryotic cell? Mention the functions that it performs. 3
 OR
 What is endoplasmic reticulum? Mention the functions that it performs.
24. State one economically important use of: 3
 a) Neurospora b) Penicillium c) Yeast

25. Draw a neat and labelled diagram of digestive system of frog. 3
26. Give the schematic representation of glycolysis? 3
27. Explain the following terms: 3
- Aestivation
 - Actinomorphic
 - Zygomorphic
28. What is stomatal apparatus? Explain the T.S. of dicot leaf with a labelled diagram. 3

SECTION – D

Q.no 29 and 30 are case based questions. Each question has subparts with internal choice in one subpart.

29. A survey of animal kingdom presents a variety of excretory structures. In most of the invertebrates, these structures are simple tubular forms whereas vertebrates have complex tubular organs called kidneys. Some of these structures are mentioned here. Protonephridia or flame cells are the excretory structures in Platyhelminthes (Flatworms, e.g., Planaria), rotifers, some annelids and the cephalochordate – Amphioxus. Protonephridia are primarily concerned with ionic and fluid volume regulation, i.e., osmoregulation. 4
- i) Name the excretory structures of most of the insects including cockroaches?

OR

Which glands perform the excretory function in crustaceans like prawns.

- ii) What is osmoregulation?
- iii) Draw and label malphigian body.
- iv) What is the role of liver and skin in excretion?
30. All vertebrates possess a muscular chambered heart. Fishes have a 2-chambered heart with an atrium and a ventricle. Amphibians and the reptiles (except crocodiles) have a 3-chambered heart with two atria and a single ventricle, whereas crocodiles, birds and mammals possess a 4-chambered heart with two atria and two ventricles. In fishes the heart pumps out deoxygenated blood which is oxygenated by the gills and supplied to the body parts from where deoxygenated blood is returned to the heart (single circulation). In amphibians and reptiles, the left atrium receives oxygenated blood from the gills/lungs/skin and the right atrium gets the deoxygenated blood from other body parts. However, they get mixed up in the single ventricle which pumps out mixed blood. In birds and mammals, oxygenated and deoxygenated blood received by the left and right atria respectively passes on to the ventricles of the same sides. The ventricles pump it out without any mixing up, i.e., two separate circulatory pathways are present in these organisms, hence, these animals have double circulation. 4
- i) What is incomplete double circulation?
- ii) Differentiate between open and closed circulatory system?
- iii) Why there is no mixing of blood in mammals and birds?
- iv) Why do we consider blood as a connective tissue?

OR

iv) Why do we call our heart myogenic?

SECTION-E

31. Explain the mechanism of breathing. How is respiration regulated? What is emphysema? 5
- OR**
- Draw and explain human respiratory system. Define oxygen dissociation curve.
32. Explain the following processes: 5
- Polarisation of the membrane of a nerve fibre.
 - Depolarisation of the membrane of a nerve fibre.
 - Conduction of a nerve impulse along a nerve fibre.
 - Transmission of a nerve impulse across a chemical impulse.

OR

Write short notes on the following:

- Neural coordination
- Forebrain
- Midbrain
- Hindbrain

33. Explain the mechanism of muscle contraction with the help of a diagram.

5

OR

Explain the structure of contractile proteins. Draw a sarcomere.