

Annual Examinations 2022-23
Class-XI, Sub: Biology

Time Allowed: 3 hours

Maximum Marks: 70

General Instructions:

1. All questions are compulsory.
2. The question paper has five sections: Section A, Section B, Section C, Section D and Section E. There are 33 questions in the question paper.
3. 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.
4. 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.
5. Wherever necessary, neat and properly labelled diagrams should be drawn.

SECTION - A

Q.1 The framework system of classification in which various taxonomic categories are arranged in order of logical sequence is called

- a) Systematics b) Classification c) Hierarchy d) Taxon

Q.2 When two nuclei lie side by side after mingling of Protoplasm then it is called as

- a) Karyogamy b) Syngamy c) Synkaryon d) Dikaryon

Q.3 What type of placentation is seen in sweet pea

- a) Marginal b) Free central c) Axile d) Basal

Q.4 Nissl's granules are found in cyton of nerve cells. These have affinity for basic dyes. The granules are made up of

- a) Proteins b) DNA c) Amino acids d) RNA

Q.5 Water vascular system is present in the phylum

- a) Echinodermata b) Hemichordata c) Arthropoda d) Mollusca

Q.6 In DNA double helix, which base pairs establish hydrogen bonds?

- a) A-G, T-C b) U-A, C-G c) A-T, C-G d) A-C, G-T

Q.7 A compound with almost similar to the substrate can be act as

- a) Competitive inhibitor b) Co-enzyme c) Isoenzyme d) Kinase

Q.8 Synapsis occurs between

- a) Spindle fibres and centrosome b) mRNA and ribosome
c) A male and female gametes d) Two homologous chromosomes

Q.9 The two daughter cells formed during mitosis contain

- a) The same amount of DNA, but a set of chromosomes different from those of the parent cell.
b) The same amount of DNA and the same set of chromosomes as those of the parent cell.
c) Half of the amount of DNA, and same set of chromosomes as those of the parent cell.
d) Double the amount of DNA and a set of chromosomes different from those of parent cell.

Q.10 The first heart sound is

- a) LUB sound at the end of systole b) DUB at the end of systole
c) LUB at the beginning of systole d) DUB at the beginning of systole

Q.11 Cell type in which C₃ and C₄ cycle take place in C₄ plant are

- a. Mesophyll and bundle sheath cells respectively
- b. Both mesophyll and bundle sheath cells
- c. Bundle sheath and mesophyll cells respectively
- d. None of the above

Q.12 Number of carbons in the primary CO₂ acceptor of C₃ cycle are

- a) 3 carbons b) 5 carbons c) 4 carbons d) 2 carbons

Q.13 Assertion: Cyanobacteria have chlorophyll a similar to green plants and are photosynthetic autotrophs,

Reason: Some of cyanobacteria can fix atmospheric nitrogen in specialised cells called heterocysts.

- a) Assertion and reason both are correct statements and reason is correct explanation for assertion.
- b) Assertion and reason both are correct statements but reason is not correct explanation for assertion.
- c) Assertion is correct statement but reason is wrong statement.
- d) Assertion is wrong statement but reason is correct statement.

Q.14 Assertion: In animal cells lipid-like steroidal hormones are synthesised in SER.

Reason: The smooth endoplasmic reticulum (SER) is the major site for synthesis of lipid.

- a) Assertion and reason both are correct statements and reason is correct explanation for assertion.
- b) Assertion and reason both are correct statements but reason is not correct explanation for assertion.
- c) Assertion is correct statement but reason is wrong statement.
- d) Assertion is wrong statement but reason is correct statement.

Q.15 Assertion: Inspiration is initiated by the contraction of the diaphragm which increases the volume of the thoracic chamber in the antero-posterior axis.

Reason: The contraction of external intercostal muscles lifts up the ribs and the sternum causing an increase in the volume of the thoracic chamber in the dorso-ventral axis.

- a) Assertion and reason both are correct statements and reason is correct explanation for assertion.
- b) Assertion and reason both are correct statements but reason is not correct explanation for assertion.
- c) Assertion is correct statement but reason is wrong statement.
- d) Assertion is wrong statement but reason is correct statement.

Q.16 Assertion: If the tissue is fully burnt, all the carbon compounds are oxidised to gaseous form like CO₂, water vapour and are removed, the remaining is called ash.

Reason: Analysis of compounds present in ash gives an idea of the kind of organic and inorganic constituents present in living tissues.

- a) Assertion and reason both are correct statements and reason is correct explanation for assertion.
- b) Assertion and reason both are correct statements but reason is not correct explanation for assertion.
- c) Assertion is correct statement but reason is wrong statement.
- d) Assertion is wrong statement but reason is correct statement.

SECTION - B

Q.17 What is heterospory? Briefly comment on its significance.

Q.18 $2\text{H}_2\text{O} \longrightarrow 4\text{H}^+ + 4\text{e}^- + \text{O}_2$

Based on the above equation, answer the following questions:

(a) Where does this reaction take place in Chloroplast?

(b) What is the significance of this reaction?

Q.19 Write the name of hydrocolloids and stored food present in brown algae and red algae?

Q.20 Distinguish cytokinesis process of animal cells from plant cells.

Q.21 What is the significance of meiosis?

SECTION – C

Q.22 Draw the structure of the amino acid, alanine.

Q.23 Describe the important properties of enzyme.

Q.24 Draw a standard ECG and explain the different segments in it.

OR

“All vertebrates are chordates but all chordates are not vertebrates.” Justify the statement.

Q.25 What are the characteristic features of slime moulds.

Q.26 Define the following:

- a) Exocrine gland
- b) Endocrine gland
- c) Hormones

Q.27 Distinguish between:

- a) Tight junction and Adhering junction
- b) Areolar tissue and Adipose tissue
- c) Skeletal muscle and Smooth muscle

Q.28 Give a brief account of the counter current mechanism.

SECTION – D

Q.29 Read the following and answer the given questions:

The prokaryotic cells are generally smaller and multiply more rapidly than the eukaryotic cells. They may vary greatly in shape and size. The organization of the prokaryotic cell is fundamentally similar even though prokaryotes exhibit a wide variety of shapes and functions. Most prokaryotic cells, particularly bacterial cells, have a chemically complex cell envelope.

- a) Explain inclusion bodies present in prokaryotes.
- b) Bacteria can be classified into how many groups on the basis of the differences in the cell shape? Write their names.
- c) Write the name and functions of special membranous structure formed by the extension of the plasma membrane into the prokaryotic cell.
- d) Explain glycocalyx.

Q.30 Read the following and answer the given questions:

In human beings, the lungs are situated in the thoracic chamber which is formed dorsally by the vertebral column, ventrally by the sternum, laterally by the ribs, and on the lower side by the dome-shaped diaphragm. The anatomical setup of the lungs in the thorax is such that any change in the volume of the thoracic cavity will be reflected in the lung (pulmonary) cavity, such an arrangement is essential for breathing. Breathing involves two stages - inspiration and expiration. During inspiration, the atmospheric air is drawn in and during expiration, the alveolar air is released out.

- a) Write the name of the two components those helps in breathing mechanism.
- b) Define partial pressure.
- c) Write the partial pressure of O_2 and CO_2 of alveolar sac.
- d) Define residual volume

SECTION - E

Q.31 Explain the significance of juxta glomerular apparatus (JGA) and hypothalamus in kidney function regulation.

OR

Sino-atrial node is called pacemaker of our heart. Why? Explain cardiac cycle and the cardiac output.

Q.32 Write the names of the hormones and their functions secreted by the following glands:

- (a) Pituitary
- (b) Thyroid
- (c) Adrenal
- (d) Testis
- (e) Ovary

OR

Give the schematic representation of an overall view of Calvin cycle. How it is different from Hatch and Slack pathway?

Q.33 Name two cell organelles that are double membrane bound. Write the characteristics of these two cell organelles? State their functions with diagrams.

OR

Draw labelled diagram of plasma membrane. How do neutral solutes move across the plasma membrane? Can the polar molecules also move across it in the same way? If not, then how are these transported across the membrane.