JB Academy, Ayodhya
Annual Examination 2023-24
Class-XI, Sub: Biology

Time: 3 hours **Maximum Marks: 70**

General Instructions:

i. All questions are compulsory.
ii. The question paper has four sections: Section A, Section B, Section C, Section D and Section E. There are 33 questions in the question paper.
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

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. Read the following statements and select the option with the incorrect statements.

1. Order is an assemblage of genera, which exhibit a few similar characters.
2. Binomial nomenclature was introduced by Carolus Linnaeus.
3. Cats and dogs are included in the family, Felidae.
4. Lower the taxon, more will be the similar characters shared by its members.

a) 1 and 2 b) 1 and 3 c) 2 and 3 d) 2 and 4

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. Which of the following are not present in the bryophytes? Read the statements and select the correct option.

A. Ciliated antherozoids
B. An independent dominant gametophytic phase
C. Vascular tissues, i.e., xylem and phloem
D. An independent dominant sporophyte
E. Sex organs, Antheridia and Archegonia

a) A, B and D b) B and E c) B, C and D d) C and D

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 Match the columns and select the correct option.

Column I	Column II
A. Polypetalous	1. Sterile stamen
B. Epiphyllous	2. Fused petals
C. Gamosepalous	3. Stamens of lily
D. Staminode	4. Fused sepals
	5. Free petals

a) A – 5, B – 4, C – 3, D – 2
b) A – 5, B – 3, C – 4, D – 1
c) A – 2, B – 3, C – 4, D – 1
d) A – 5, B – 4, C – 2, D – 1

Q.12 The bond formed between the monomers in a polysaccharide is a/an
a) peptide bond b) glycosidic bond c) ester bond d) phosphoester bond

Q.13 **Assertion:** Nerve conduction is the one-way conduction.
Reason: Nerve impulse is transmitted from dendrite terminals to axon terminals.

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 CO_2, 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 Differentiate between homosporous and heterosporous pteridophytes.

Q.18 Name and differentiate between the two types of synapses.

Q.19 Draw the structures of bacteria on the basis of its shapes.

Q.20 Differentiate between process of cytokinesis in animal and plant cells with the help of labelled diagrams only.

Q.21 Write the name of cell and organism in which during gametogenesis mitosis occurs.

SECTION-C

Q.22 Draw chemical structure of Glycine and Alanine amino acids.

Q.23 In which phase of meiosis are the following formed? Choose the answers from hint points given below:

(*a*) Synaptonemal complex .....

(*b*) Recombination nodules .....

(*c*) Appearance/Activation of enzyme recombinase .....

(*d*) Terminalisation of chiasmata .....

(*e*) Interkinesis .....

(*f*) Formation of dyad cells .....

Q.24 Draw an ECG and explain the properties of its different waves.

OR

Draw a sketch of the human urinary system, with its associated blood vessels. Label any six parts.

Q.25 (*a*) Name two species of algae from which agar is obtained.

(*b*) Which class of algae do they belong to?

(*c*) Mention the economic uses of agar.

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 counter current mechanism.

SECTION-D

Q.29 **Read the following and answers the 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.

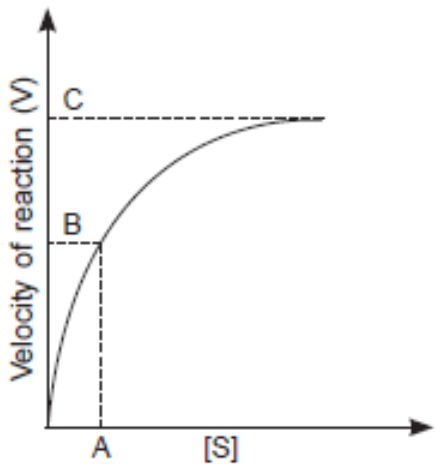
i) Which is the outermost layer of the cell envelope in prokaryote?

ii) Bacteria can be classified into how many groups on the basis of the differences in the cell shape? Write their names.

iii) Write the name and functions of special membranous structure formed by the extension of the plasma membrane into the prokaryotic cell.

iv) Explain glycocalyx.

Q.30 Study the following graph showing the effect of substrate concentration on the rate of enzyme activity and answer the questions that follow:



a) Define what is represented by A.

b) What does C represent in the graph?

c) Why is there no further increase in the velocity of enzyme action with addition of substrate?

d) How can the catalytic efficiency of two enzymes be compared? Justify your answer.

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

Explain the following processes:

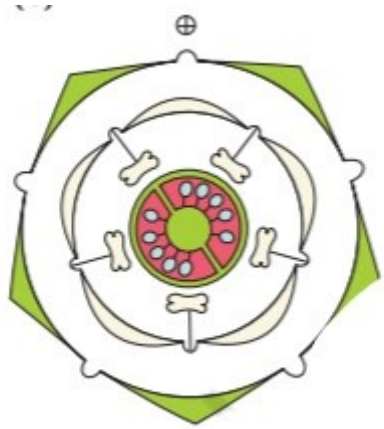
(a) Polarisation of the membrane of a nerve fibre

(b) Depolarisation of the membrane of a nerve fibre

(c) Conduction of a nerve impulse along a nerve fibre

(d) Transmission of a nerve impulse across a chemical synapse

Q.33 With the help of floral diagrams given below describes the flower and writes the floral formula.



OR

Give the values of each of the following:

(a) PO_2 of - (*i*) alveolar air, (*ii*) oxygenated blood and (*iii*) a metabolically active tissue.

(b) PCO_2 of - (*i*) alveolar air, (*ii*) deoxygenated blood and (*iii*) oxygenated blood.

Using above value, diagrammatically show the exchange of gases at **(*a*)** the alveoli and **(*b*)** the body tissue with blood and the transport of respiratory gases.