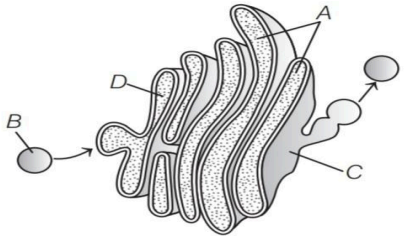
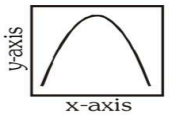
OSDAV Public School, Kaithal
FIRST UNIT TEST (May ,2025)
CLASS- XI
SUBJECT- BIOLOGY **Set- A**

Time:1hr 30 min. **MM:35**

General Instructions:

1. **All questions are compulsory**

SECTION-A

Q.1	In Column-I, Organelle is given and in Column-II its function is given, select the correct option Column-I Column-II P Mitochondria 1 Suicide bag Q Chloroplast 2 Synthesis of steroids R Lysosome 3 Photosynthesis S SER 4 ATP- formation and storage A) (P – 4) (Q – 3) (R – 1) (S – 2) B) (P – 2) (Q – 1) (R – 4) (S – 3) C) (P – 4) (Q – 3) (R – 2) (S – 1) D) (P – 1) (Q – 2) (R – 3) (S – 4)	**1**
Q 2	Which one of the following is the correct labelling of given structures ofGolgi apparatus?  (a) A–Cisternae, B–Vesicle, C–Cis face,D–Trans face (b) A–Cisternae, B–Vesicle, C–Trans face,D–Cis face (c) A–Tubules, B–Vesicle, C–Trans face,D–Cis face (d) A–Vesicle, B–Cisternae, C–Cis face,D–Trans f	**1**
Q.3	Name the elements which occur in nucleic acid; A)C,H,O,N,S B)C,O,N,S C)C,O,P,S D)C,H,O,N,P	**1**
Q.4	How many equational divisions are necessary in a cell of onion root tip to form 128 cells? (a)64 (b)128 (c) 6 (d) 7	**1**
Q.5	Identify the correct pair. **Proteins** **Functions** (a) Collagen Hormone (b) Antibody Fights infectious agents (c) Insulin Intercellular ground substance (d) Trypsin Enables glucose transport in ce	**1**
Q.6	The curve given below shows enzymatic activity with relation to three conditions (pH, temperature and substrate concentration)  What do the two axises (x and y) represent ? **x-axis** **y-axis**	**1**

	A)Enzymatic activity pH B)Temperature Enzyme activity C) Substrate concentration Enzymatic activity D)Enzymatic activity, Temperature	
Q.7	**ASSERTION AND REASON BASED QUESTION** A -- both assertion and reason are true and reason is the correct explanation of assertion B-- both assertion and reason are true and reason is not correct explanation of assertion C-- assertion is true but reason is false D-- assertion is false but reason is true **Assertion:** oils have lower melting point. **Reason:** oils mainly contain saturated fatty acid.	**1**
Q.8	**Assertion** : The chromoplasts contain fat soluble carotenoid pigments. **Reason** : These pigments provide colour to plant parts other than green.	**1**

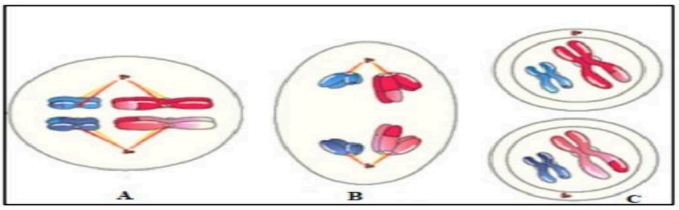
SECTION-B

Q.9	How prosthetic groups, coenzymes and metal ions are different from each other? Explain	**2**
Q.10	How do neutral solutes move across the plasma membrane? Can the polar molecules also move across it in the same way? If not, how are these transported across the membrane?	**2**

SECTION-C

Q.11	Explain fluid mosaic model of plasma membrane with well labelled diagram.	**3**
Q.12	A)Write the functions of the following a. Centromere b. Cell wall c. Golgi Apparatus d. Centrioles B)State 2 postulates the cell theory.	**3**
Q.13	What is enzymatic competitive inhibition? Give one example?	**3**

SECTION-D

Q.14	**CASE STUDY BASED QUESTION** Ritika observed the permanent slides of different stages of meiosis and drew the diagrams as follows:  (a) Name the stages A, B and C observed by her and state the main identifying features of the same. (b) Briefly describe the salient features of zygotene and pachytene phases of Prophase-I.	**4**

SECTION- E

Q.15	A)On the basis of the position of the centromere, how many types of chromosomes are there?Explain with diagrams. B)Compare ribosomes of prokaryotic and eukaryotic cell	**5**
Q.16	Explain briefly four levels of protein structure?	**5**

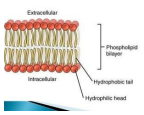
BIOLOGY-- XI
FIRST UNIT TEST(May,25)
ANSWER KEY AND MARKING SCHEME Set-A
SECTION-A

Q.1	**A**	**1**
Q.2	**B**	**1**
Q.3	**D**	**1**
Q.4	**D**	**1**
Q.5	**B**	**1**
Q.6	**B**	**1**
Q.7	**C**	**1**
Q.8	**B**	**1**

SECTION-B

Q.9	Prosthetic groups are organic compounds tightly bound to the apoenzyme. In peroxidase and catalase haem is the prosthetic group. Coenzymes are also organic compounds but their association with the apoenzyme is only transient. E.g. coenzyme nicotinamide adenine dinucleotide (NAD) and NADP. Metal ions form coordination bonds with side chains of enzyme at the active site and at the same time form one or more coordination bonds with the substrate, e.g., zinc is a cofactor for the proteolytic enzyme carboxypeptidase.	½ ½ **1**
Q.10	The neutral solutes are lipid-soluble; hence they pass through the lipid bilayer. No, polar molecules cannot move across the plasma membrane in the same way as neutral solutes; they require particular hydrophilic areas for their passage. They get transported by three types of transport mechanisms – ions, channels, permeases and active transport utilising ATP.	**1** **1**

SECTION-C

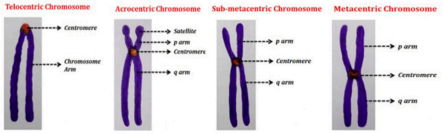
Q.11	Fluid mosaic model was given by Singer and Nicholson. According to this theory the phospholipid molecules are arranged to form a continuous bimolecular layer of vlipid molecules. The two layers are arranged in such a way that the polar heads of the lipid molecules face the outside while the hydrophobic tails of the lipid are on the inner sides. besides lipids the cell membrane also has proteins, cholesterol and carbohydrates attached to it.  	**2** **1**
Q.12	A)a. Centromere- The centromere is a constricted region of a chromosome that plays a key role in cell division, helping the cell to divide up its DNA during mitosis and meiosis. b. Cell wall- It gives shape to the cell and protects cell from mechanical damage and infection, helps in cell-to-cell interaction c. Golgi Apparatus- Performs packaging of materials, to be delivered either to the intracellular targets or secreted outside the cell. Important site of formation of glycoproteins and glycolipids. d. Centrioles- Centrioles form the basal body of cilia or flagella and spindle fibres for cell division in animal cells. B). i. all living organisms are composed of cells and products of cells.	**2** **1**

	ii. All cells arise from pre-existing cells.	
Q.13	Competitive inhibition occurs when molecules very similar to the substrate molecules bind to the active site and prevent binding of the actual substrate. Penicillin, for example, is a competitive inhibitor that blocks the active site of an enzyme that many bacteria use to construct their cell… 	**2** **1**

SECTION-D

Q.14	i)a) A- Metaphase I; Bivalent chromosomes align on equatorial plate B-Anaphase I; Homologous chromosomes separate while sister chromatids remain associated at centromere. C-Telophase I; Nuclear membrane and nucleolus reappear/cytokinesis leads to formation of dyad of haploid cells(any one) b) Zygotene: -pairing together homologous chromosomes/synapsis. -formation of synaptonemal complex; bivalent formation Pachytene: -Four chromatids of bivalent separate(tetrad) -appearance of recombination nodules -crossing over between non sister chromatids of homologous chromosomes	**1** **1** **1** **½** **½**

SECTION-E

Q.15	The type of chromosomes based on the position of centromere are of the following four types : 1) Metacentric chromosome: centromere in middle forming two equal arms. 2) Sub-metacentric chromosome: centromere placed near to one end resulting in one shorter and one long arm. 3) Acrocentric chromosome: Centromere placed close to one end forming one extreme short and one extreme long arm. 4) Telocentric chromosome: terminally placed centromere.  B): Eukaryotic cell ribosome: 80 S (60 S+ 40 S), Prokaryotic cell ribosome: 70 S (50 S + 30 S)	**4** **1**
Q.16	The four levels of protein structures are explained below: **a. Primary Structure:** A protein occurs as a long chain of amino acids organized in a certain sequence. For example, the polypeptide is non-functional. **b. Secondary Structure:** The first amino acid is known as N-terminal amino acid, while the last is known as C-terminal amino acid. Every fourth amino acid interacts with another by forming a	**1** **2**

	hydrogen bond, and the polypeptide is folded in a helical shape, as in keratin. When two or more polypeptide chains are joined together by intermolecular hydrogen bonds, a pleated sheet structure is formed. **c. Tertiary Structure:** The polypeptide is stabilized by folding and coating, which results in the creation of ionic bonds, hydrophobic bonds, or disulfide bridges. It is referred to as a tertiary structure. It displays proteins in three dimensions. The biological activity of a protein is determined by its tertiary structure. **d. Quaternary Structure:** These proteins are made up of several polypeptides or subunits, each with its primary, secondary, and tertiary structure. This is referred to as a quaternary structure. Each polypeptide chain serves as a protein component.	**1** **1**

OSDAV Public School, Kaithal
FIRST UNIT TEST (May ,2025)
CLASS- XI
SUBJECT- BIOLOGY

SET-B

Time:1hr.30 min. **MM:35**

General Instructions:

1. **All questions are compulsory**

SECTION-A

Q.1	Match the columns. 1. Cytoskeleton – A. hair-like outgrowth 2. Flagella – B. proximal region of centriole 3. Hub – C. bristle-like structures 4. Fimbriae – D. filamentous protein structure A) 1-D, 2-A, 3-B, 4-C B) 1-D, 2-C, 3-B, 4-A C) 1-B, 2-D, 3-A, 4-C D) 1-D, 2-A, 3-C, 4-B	**1**
Q 2	Circular DNA is found in a. mitochondria, chloroplast, nucleus b. nucleoid, mitochondria, nucleolus c. bacteria, mitochondria, chloroplast d. nucleoid, mitochondria, nucleus	**1**
Q.3	Which acid is commonly used to make slurry of tissue during analysis of biomolecules? A) Hydrochloric acid B)Sulphuric acid C)Trichloroacetic acid D)Acetic acid	**1**
Q.4	Which one of the following cellular parts is correctly described? (a) Centrioles – Sites for active RNA synthesis (b) Lysosomes – Optimally active at a pH of about 8.5 (c) Thylakoids – Flattened membranous sacs forming the grana of chloroplasts (d) Ribosomes – Those on chloroplasts arelarger (80S) while those in the cytoplasm are smaller (70S)	**1**
Q.5	A typical fat molecule is made up of; A) three glycerol molecules and one fatty acid molecule B) 1 glycerol molecule and 3 fatty acid molecules C) One glycerol molecule and one fatty acid molecule D) 3 glycerol molecules and 3 fatty acid molecules	**1**
Q.6	Given below are different sub-stages of prophase I. Match them with their correct feature. **Column I** **Column II** I Zygotene i Formation of bivalent II Pachytene ii Terminalization of chiasmata III Diakinesis iii Dissolution of synaptonemal complex IV Leptotene iv Crossing over mediated by recombinase V Diplotene v Chromosomes start condensing a. I-v, II-i, III-iv, IV-iii, V-ii b. I-i, II-iii, III-ii, IV-v, V-iv c. I-i, II-iv, III-ii, IV-v, V-iii d. I-v, II-iv, III-ii, IV-i, V-iii	**1**
Q.7	**ASSERTION AND REASON BASED QUESTION** A -- both assertion and reason are true and reason is the correct explanation of assertion	

	B-- both assertion and reason are true and reason is not correct explanation of assertion C-- assertion is true but reason is false D-- assertion is false but reason is true **Assertion** :Starch is a polymer of glucose. **Reason** : It is made of several glucose units.	**1**
Q.8	**Assertion**: Ribosomes are non-membrane bound organelles found in the prokaryotic cells only. **Reason:** These are present in the cytoplasm.	**1**

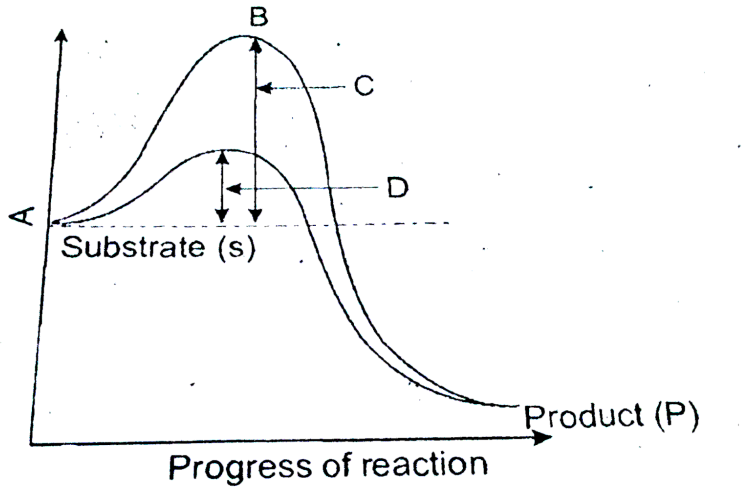
SECTION-B

Q.9	What are 9 + 2 and 9 + 0 arrangements.Explain these with the help of examples.	**2**
Q.10	Explain secondary and tertiary structure of protein.	**2**

SECTION-C

Q.11	A)Why is meiosis necessary in sexually reproducing organisms? B)List any four differences between mitosis and meiosis.	**3**
Q.12	Explain fluid mosaic model of plasma membrane with well labelled diagram.	**3**
Q.13	What is enzymatic competitive inhibition? Give one example?	**3**

SECTION-D

Q.14	**CASE STUDY BASED QUESTION** The following graph shows the concept of activation energy.Study the graph and answer the following questions (i) What do the letters 'a', 'b', 'c' and 'd' represent in the graph? (il) What is activation energy? (iii) what is the position of substrate and product in endothermic reaction?  	**4**

SECTION- E

Q.15	A)On the basis of the position of the centromere, how many types of chromosomes are there?Explain with diagrams. B)Name the nutrient stored in (i) elaioplasts (ii) aleuroplasts	**5**
Q.16	Describe the different phases of meiotic prophase – I. Mention the chromosomal events during each stage.	**5**

BIOLOGY-- XI
FIRST UNIT TEST(May,2025)
ANSWER KEY AND MARKING SCHEME Set-B
SECTION-A

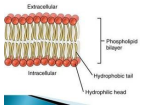
Q.1	**A**	**1**
Q.2	**C**	**1**
Q.3	**C**	**1**
Q.4	**C**	**1**
Q.5	**B**	**1**
Q.6	**C**	**1**
Q.7	**A**	**1**
Q.8	**D**	**1**

SECTION-B

Q.9	Eukaryotic flagella and cilia share a common structural organization of 9+2 arrangement. Here, nine doublet microtubules are arranged peripherally surrounding a central pair of singlet microtubules The walls of each centriole are composed of nine triplet microtubules arranged peripherally without any central microtubules. The central part of the centriole is proteinaceous and called the hub, which is connected with the peripheral triplets via radial spokes made up of protein. This is known as the 9+ 0 arrangement.	**1** **1**
Q.10	Secondary structure: Polypeptide chain undergoes folding or coiling which is stabilized-by hydrogen bonding. Right-handed helices are observed; e.g., Fibrous protein in hair, nails. Tertiary structure: Long protein chain is folded upon itself like a hollow woollen ball. Gives a 3-dimensional view of protein, e.g., myosin.	**1** **1**

SECTION-C

Q.11	A)maintains the number of chromosomes constant in generation as meiosis is a reductional division B) **Mitosis** / **Meiosis** One division / Two divisions Number of chromosome remain the same / Number of chromosomes is halved Homologous chromosomes line up separately on the metaphase plate / Homologous chromosomes line up in pairs at the metaphase plate Homologous chromosome do not pair up / Homologous chromosome pairup to form bivalent Chiasmata do not form and crossing over never occurs / Chiasmata form and crossingover occurs Daughter cells are genetically identical / Daughter cells are genetically different from parent cell Two daughter cells are formed / Four daughter cells are formed	**1** **2**

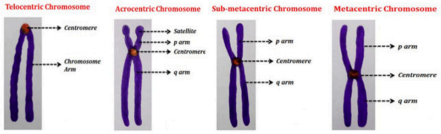
Q.12	Fluid mosaic model was given by Singer and Nicholson. According to this theory the phospholipid molecules are arranged to form a continuous bimolecular layer of vlipid molecules. The two layers are arranged in such a way that the polar heads of the lipid molecules face the outside while the hydrophobic tails of the lipid are on the inner sides. besides lipids the cell membrane also has proteins, cholesterol and carbohydrates attached to it.  	**2** **1**
Q.13	Competitive inhibition occurs when molecules very similar to the substrate molecules bind to the active site and prevent binding of the actual	**2**

	substrate. Penicillin, for example, is a competitive inhibitor that blocks the active site of an enzyme that many bacteria use to construct their cell… 	1

SECTION-D

Q.14	i)A potential energy B transition state C activation energy without enzyme D activation energy with enzyme ii) Activation energy is defined as the minimum amount of extra energy required by a reacting molecule to get converted into product iii) substrate lower level,product upper level	**2** **1** **1**

SECTION-E

Q.15	The type of chromosomes based on the position of centromere are of the following four types : 1) Metacentric chromosome: centromere in middle forming two equal arms. 2) Sub-metacentric chromosome: centromere placed near to one end resulting in one shorter and one long arm. 3) Acrocentric chromosome: Centromere placed close to one end forming one extreme short and one extreme long arm. 4) Telocentric chromosome: terminally placed centromere.  B) oils and fats Proteins	**4** **1**
Q.16	During the prophase – I, genetic recombination and variation in sexually reproducing entities takes place due to the events of this stage. Leptotene ● Chromosomes are long, thin and slender ● Chromatin network exposes and threads appear clear ● The diploid number of chromosomes Zygotene ● Similar chromosomes turn intimately associated ● Synapse is exact hence pairing is not just between chromosomes, but corresponding individual units. ● Chromosomes appear thicker and shorter Pachytene ● Synaptic chromosomes become intimately related ● Thick and short pair of chromosomes ● Cross over occurs, Chiasmata visible clearly Diplotene ● Homologous chromosomes start detaching from each other. ● Chiasmata tends to shift away from chromosomes, termed as thermalization of chiasmata	**1** **1** **1** **1**

	● Chromosomes detach out, but it is an incomplete separation ● Nucleolus and nuclear membrane start to fade. Diakinesis ● The bivalents are randomly distributed after further condensation ● The paired chromosomes separate completely ● Terminalisation of chiasmata is almost concluded ● The disappearance of the nucleolus and nuclear membrane	**1**