



OSDAV Public School, Kaithal
FIRST UNIT TEST (May ,24)
CLASS- XI
SUBJECT- BIOLOGY

SET-B

Time:1hr.

MM:30

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	Glycocalyx is associated with; A) nucleolus B) plasma membrane C) centriole D) ribosomes	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 of the following are not membrane bound? A) vacuole B) ribosomes C) lysosomes D) plastids	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	What is the full form of RuBisCO? a) Ribosome bisphosphate Carboxylase-Oxidase b) Ribulose bisphosphate Carboxylase-Oxidase c) Ribosome bisphosphate Carboxy-Oxygenase d) Ribulose bisphosphate Carboxylase-Oxygenase	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: Cellulose is a homopolymer. Reason: It is made up of only one type of monosaccharide unit,	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

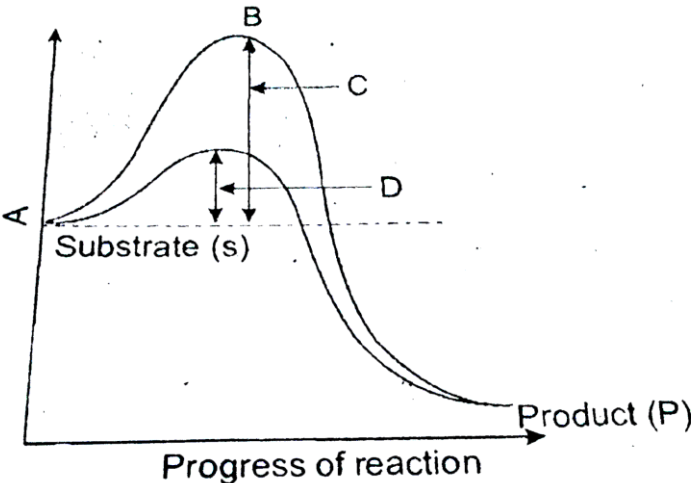
Q.9	What are 9 + 2 and 9 + 0 arrangements. Explain these with the help of examples.	2
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Q.10	How do neutral solutes move across the plasma membrane? Can the polar molecules also move across it in the same way? If not, how are these transported across the membrane?	2
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SECTION-C

Q.11	A)Why is meiosis necessary in sexually reproducing organisms? B)List any five 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?Draw diagrams also.	3

SECTION-D

Q.14	<p align="center">CASE STUDY BASED QUESTION</p> <p>The following graph shows the concept of activation energy. Study the graph and answer the following questions</p> <p>(i) What do the letters 'a', 'b', 'c' and 'd' represent in the graph?</p> <p>(ii) What is activation energy?</p> <p>(iii) what is the position of substrate and product in endothermic reaction?</p> 	4
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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)How do cytokinesis and Karyokinesis differ?	5
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SECTION-A

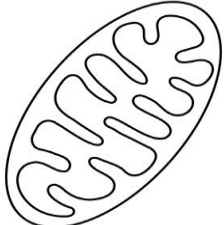
Q.1	<p>In Column-I, Organelle is given and in Column-II its function is given, select the correct option</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">Column-I</td> <td style="width: 50%;">Column-II</td> </tr> <tr> <td>P Mitochondria</td> <td>1 Suicide bag</td> </tr> <tr> <td>Q Chloroplast</td> <td>2 Synthesis of steroids</td> </tr> <tr> <td>R Lysosome</td> <td>3 Photosynthesis</td> </tr> <tr> <td>S SER</td> <td>4 ATP- formation and storage</td> </tr> </table> <p>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)</p>	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	1
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											
Q.2	<p>The cytoplasm of adjacent plant cells is connected to each other by:</p> <p>A)Plasmalemma B)Desmosome C)Plasmodesmata D) Plasma Tubule</p>	1										
Q.3	<p>Name the elements which occur in nucleic acid;</p> <p>A)C,H,O,N,S B)C,O,N,S C)C,O,P,S D)C,H,O,N,P</p>	1										
Q.4	<p>Which structure in bacteria performs the same function as mitochondria in plant cells</p> <p>a- Plasmid b- Mesosomes c- Glycocalyx d- Peptidoglycan</p>	1										
Q.5	<p>Proteins perform many physiological functions. For example, some function as enzymes. Which one of the following represents an additional function which some proteins discharge?</p> <p>(a) Antibiotics (b) Pigments making colours of flowers (c) Hormones (d) Pigments conferring colour to skin</p>	1										
Q.6	<p>The curve given below shows enzymatic activity with relation to three conditions (pH, temperature and substrate concentration)</p> <div style="text-align: center;"> </div> <p>What do the two axes (x and y) represent ?</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">x-axis</td> <td style="width: 50%;">y-axis</td> </tr> <tr> <td>A)Enzymatic activity</td> <td>pH</td> </tr> <tr> <td>B)Temperature</td> <td>Enzyme activity</td> </tr> <tr> <td>C) Substrate concentration</td> <td>Enzymatic activity</td> </tr> <tr> <td>D)Enzymatic activity,</td> <td>Temperature</td> </tr> </table>	x-axis	y-axis	A)Enzymatic activity	pH	B)Temperature	Enzyme activity	C) Substrate concentration	Enzymatic activity	D)Enzymatic activity,	Temperature	1
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B)Temperature	Enzyme activity											
C) Substrate concentration	Enzymatic activity											
D)Enzymatic activity,	Temperature											
Q.7	<p style="text-align: center;">ASSERTION AND REASON BASED QUESTION</p> <p>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</p> <p>Assertion: oils have lower melting point. Reason: oils mainly contain saturated fatty acid.</p>	1										

Q.8	Assertion: A cell membrane shows fluid behaviour. Reason: A membrane is a mosaic or composite of diverse lipids and proteins.	1
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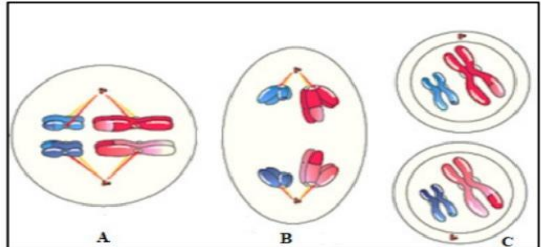
SECTION-B

Q.9	A)What is glycocalyx? Write its different form. B)Mitochondria, chloroplast, and peroxisomes are not part of the endomembrane system. Give reason	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	 <p>A) Identify the diagram and give its another name also. A) Label finger-like structures in the diagram. B) Explain the structure of the above diagram.</p>	3
Q.13	What is enzymatic competitive inhibition? Give one example?Draw diagrams also.	3

SECTION-D

Q.14	<p align="center">CASE STUDY BASED QUESTION</p> <p>Ritika observed the permanent slides of different stages of meiosis and drew the diagrams as follows:</p>  <p>(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.</p>	4
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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
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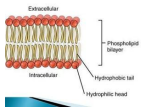
BIOLOGY-- XI
FIRST UNIT TEST(May,24)
ANSWER KEY AND MARKING SCHEME **Set-A**
SECTION-A

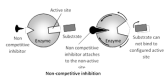
Q.1	A	1
Q.2	C	1
Q.3	D	1
Q.4	B	1
Q.5	C	1
Q.6	B	1
Q.7	C	1
Q.8	B	1

SECTION-B

Q.9	A)The outermost layer of cell envelope in bacteria is the glycocalyx. It could be a loose sheath called the slime layer in some; while in others it may be thick and tough, called the capsule	1
	B)the function of some cell organelles is coordinated, these are called endomembrane systems like endoplasmic reticulum (ER), Golgi complex, lysosomes and vacuoles. Since the functions of the mitochondria, chloroplast and peroxisomes are not coordinated with the above components; these are not considered as part of the endomembrane system	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

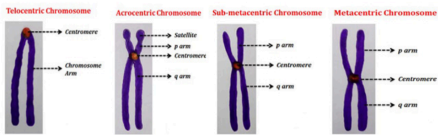
Q.11	Fluid mosaic model was given by Singer and Nicholson. According to this theory the phospholipid molecules are arranged to form a continuous bimolecular layer of lipid molecules. The two layers are arranged in such a way that the polar heads of the lipid molecules face the outside while the hydrophobic 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) mitochondria, powerhouse of the cell	1
	B) Cristae	1/2

	<p>C) Mitochondria have an inner and outer membrane, with an intermembrane space between them. The outer membrane contains proteins known as porins, which allow movement of ions into and out of the mitochondrion. Enzymes involved in the elongation of fatty acids and the oxidation of adrenaline can also be found on the outer membrane. The space within the inner membrane of the mitochondrion is known as the matrix, which contains the enzymes of the Krebs (TCA) and fatty acid cycles, alongside DNA, RNA, ribosomes and calcium granules. The inner membrane contains a variety of enzymes. It contains ATP synthase which generates ATP in the matrix, and transport proteins that regulate the movement of metabolites into and out of the matrix.</p>	1.5
Q.13	<p>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...</p> 	2 1

SECTION-D

Q.14	<p>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)</p> <p>b) Zygotene: -pairing together homologous chromosomes/synapsis. -formation of synaptonemal complex; bivalent formation</p> <p>Pachytene: -Four chromatids of bivalent separate(tetrad) -appearance of recombination nodules -crossing over between non sister chromatids of homologous chromosomes</p>	1 1 1 1/2 1/2
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SECTION-E

Q.15	<p>The type of chromosomes based on the position of centromere are of the following four types :</p> <ol style="list-style-type: none"> 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. 	4
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	B): Eukaryotic cell ribosome: 80 S (60 S+ 40 S), Prokaryotic cell ribosome: 70 S (50 S + 30 S)	1
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ANSWER KEY AND MARKING SCHEME **Set-B**
SECTION-A

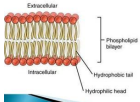
Q.1	A	1
Q.2	B	1
Q.3	C	1
Q.4	B	1
Q.5	B	1
Q.6	D	1
Q.7	A	1
Q.8	D	1

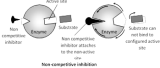
SECTION-B

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	1
	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
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	A)maintains the number of chromosomes constant in generation as meiosis is a reductional division	1															
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Mitosis</th> <th style="text-align: center;">Meiosis</th> </tr> </thead> <tbody> <tr> <td>One division</td> <td>Two divisions</td> </tr> <tr> <td>Number of chromosome remain the same</td> <td>Number of chromosomes is halved</td> </tr> <tr> <td>Homologous chromosomes line up separately on the metaphase plate</td> <td>Homologous chromosomes line up in pairs at the metaphase plate</td> </tr> <tr> <td>Homologous chromosome do not pair up</td> <td>Homologous chromosome pair up to form bivalent</td> </tr> <tr> <td>Chiasmata do not form and crossing over never occurs</td> <td>Chiasmata form and crossingover occurs</td> </tr> <tr> <td>Daughter cells are genetically identical</td> <td>Daughter cells are genetically different from parent cell</td> </tr> <tr> <td>Two daughter cells are formed</td> <td>Four daughter cells are formed</td> </tr> </tbody> </table>	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 pair up 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
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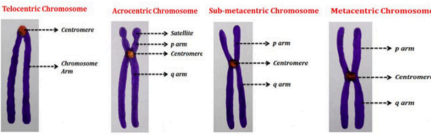
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		1
Q.13	Competitive inhibition occurs when molecules very similar to the substrate	

	<p>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...</p> 	<p>2</p>
		<p>1</p>

SECTION-D

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

<p>Q.15</p>	<p>The type of chromosomes based on the position of centromere are of the following four types :</p> <ol style="list-style-type: none"> 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.  <p>B) Karyokinesis: division of the nucleus Cytokinesis: division of cytoplasm</p>	<p>4</p> <p>1</p>
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