

# BIOLOGY HSSC-I

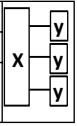
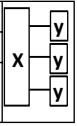
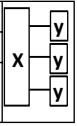
Time allowed: 2:35 Hours

Total Marks Sections B and C: 68

## SECTION – B (Marks 42)

Q. 2 Answers the following questions briefly.

(14 x 3 = 42)

(i)	The diagram represents a neutral lipid: <table border="1" style="margin-left: 20px; border-collapse: collapse;"> <tbody> <tr> <td style="width: 20px; text-align: center;">a</td> <td>Name the components X and Y.</td> <td rowspan="3" style="text-align: center; vertical-align: middle;">  </td> </tr> <tr> <td style="text-align: center;">b</td> <td>Name type of bond between X and Y.</td> </tr> <tr> <td style="text-align: center;">c</td> <td>Why this molecule is called neutral lipid?</td> </tr> </tbody> </table>	a	Name the components X and Y.		b	Name type of bond between X and Y.	c	Why this molecule is called neutral lipid?	03	OR	Complete the table with reference to bacterial cell wall: <table border="1" style="margin-left: 20px; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%;">Character</th> <th style="width: 20%;">Gram-ive</th> <th style="width: 20%;">Gram+ive</th> </tr> </thead> <tbody> <tr> <td>Porins</td> <td></td> <td></td> </tr> <tr> <td>Peptidoglycans</td> <td></td> <td></td> </tr> <tr> <td>Thickness</td> <td></td> <td></td> </tr> </tbody> </table>	Character	Gram-ive	Gram+ive	Porins			Peptidoglycans			Thickness			03				
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(ii)	What are mesophytes? How they adapt to their environment? (Any four adaptations)	1+2	OR	What are evolutionary adaptations in echinoderms regarding digestion, respiration and nervous system?	03																							
(iii)	Differentiate between primary and secondary growth.(Any three differences)	03	OR	Differentiate between Mitochondria and Chloroplasts.(Any three differences)	03																							
(iv)	How does natural killer cell kill, 'cells infected by bacteria' and 'cancerous cells'?	03	OR	Laboratory manufactured sugars are not metabolized by enzymes in body. Justify.	03																							
(v)	How does pH affect the rate of an enzyme action? Compare the optimum pH for trypsin and papain.	2+1	OR	How does temperature affect activities of RuBisCO?	03																							
(vi)	Complete the table: <table border="1" style="margin-left: 20px; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%;">Character</th> <th style="width: 20%;">Animal</th> <th style="width: 20%;">Plant</th> <th style="width: 20%;">Fungus</th> </tr> </thead> <tbody> <tr> <td>Mode of Nutrition</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Cell wall composition</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Presence of centriole</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Character	Animal	Plant	Fungus	Mode of Nutrition				Cell wall composition				Presence of centriole				03	OR	A student accidentally got a small cut on finger in lab. What series of events would occur as inflammatory response to this injury?	03							
Character	Animal	Plant	Fungus																									
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(vii)	Draw the structure of an antibody. Label its parts. Write their specific roles.	03	OR	Draw an outline of Calvin cycle mentioning substrates and products of each step.	03																							
(viii)	a Why the Human Immunodeficiency Virus is called so? b Name two opportunistic diseases caused by HIV. c Name any two enzymes present in HIV core.	03	OR	a Why bryophytes are called amphibious plants? b Write any two distinguishing features of bryophytes.	1+2																							
(ix)	How does development of protostomes and deuterostomes differ in cleavage, coelom formation and blastopore fate?	03	OR	Draw and label the steps of lysogenic cycle of bacteriophage.	03																							
(x)	How does blood circulation occur between heart and kidneys? Elaborate the answer.	03	OR	What is feedback inhibition in enzymes? Elaborate with a proper example.	1+2																							
(xi)	Enlist the parts of large intestine. Also write the specific roles of large intestine.	1+2	OR	What is photoperiodism? How does it affect short day and long day plants? Give one example of each.	03																							
(xii)	Briefly explain Racemose and Cymose types of inflorescence.	03	OR	What is Mycorrhizae? Name and differentiate between its two types.	1+2																							
(xiii)	Name the parts of a bacterial flagellum. Also write their structures.	03	OR	Briefly describe any three benefits of bacterial flora of humans.	03																							
(xiv)	Complete the table: <table border="1" style="margin-left: 20px; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;"></th> <th style="width: 20%;">Group</th> <th style="width: 20%;">Character</th> <th style="width: 20%;">Example</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td>Whisk fern</td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">2</td> <td></td> <td>Jointed stem</td> <td></td> </tr> <tr> <td style="text-align: center;">3</td> <td></td> <td></td> <td><i>Adiantum</i></td> </tr> </tbody> </table>		Group	Character	Example	1	Whisk fern			2		Jointed stem		3			<i>Adiantum</i>	03	OR	Gametophyte of ferns is shown in the diagram: <table border="1" style="margin-left: 20px; border-collapse: collapse;"> <tbody> <tr> <td style="width: 20px; text-align: center;">a</td> <td>What is other name for this structure?</td> <td rowspan="3" style="text-align: center; vertical-align: middle;">  </td> </tr> <tr> <td style="text-align: center;">b</td> <td>Label parts A and B.</td> </tr> <tr> <td style="text-align: center;">c</td> <td>How does gametophyte of ferns differ from other plants' gametophytes?</td> </tr> </tbody> </table>	a	What is other name for this structure?		b	Label parts A and B.	c	How does gametophyte of ferns differ from other plants' gametophytes?	03
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## SECTION – C (Marks 26)

Attempt the following questions.

Q.3	Explain the components and mechanism of electron transport chain in mitochondria. Also draw the flow sheet.	4+2	OR	Describe general characteristics of class Mammalia.	06
Q.4	Describe the role of Lysosomes in Autophagy, intracellular digestion and autolysis. (Diagram is not required)	3+2 +2	OR	Explain the structure and role of different components of conducting system of human heart.	4+3
Q.5	Write down general characteristics of polysaccharides. Describe characteristics and molecular structure of starch and cellulose.	2+2 +2	OR	Explain the mechanisms of pathways taken by water to reach xylem tissue in plants.	06
Q.6	Explain development of male and female gametophytes in flowering plants. Also draw life cycle of a flowering plant.	2+3 +2	OR	Outline the structure of pancreas and explain its role as an exocrine gland.	2+5

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## SECTION – B (Marks 42)

Q. 2 Answers the following questions briefly.

(14 x 3 = 42)

(i)	Elaborate the role of peroxisomes in plant and animal cells.	2+1	OR	Relate variety of proteins of plasma membrane with their respective roles.(Any three)	03																
(ii)	Illustrate the formation of glycosidic bonds in: a Sucrose      b Maltose	03	OR	Illustrate the process of non-cyclic photophosphorylation with labelling.	03																
(iii)	Justify the significance of amino acid sequence by explaining example of sickle cell haemoglobin.	03	OR	Outline the process of C <sub>4</sub> photosynthesis in a flow chart.	03																
(iv)	How do oxidoreductases, hydrolases and lyases work? Also give one example of each group.	03	OR	How does endospore formation occur in bacteria? How does it help bacteria to withstand unfavorable conditions?	2+1																
(v)	Describe steps of lytic cycle of bacteriophage.	03	OR	Explain pathogenic role of fungi in human with their symptoms. (Any three)	03																
(vi)	A person was bitten by snake. Antivenom was injected. a How does antivenom work? b Why was passive immunity preferred?	03	OR	A bacterium is shown in the diagram: a Name the structures P and R. b Write chemical composition of Q. c Name the process by which bacteria reproduces asexually.	1x3																
(vii)	T-cells are involved in specific defence. Name any three types of T-cells with their specific roles.	03	OR	Write about evolutionary adaptations in phylum arthropoda regarding respiration, excretion and nervous system.	03																
(viii)	Briefly explain the flow of blood through heart as regulated by valves.	03	OR	Write down steps of swallowing action of bolus in oral cavity.	03																
(ix)	a How does temperature affect rate of an enzyme catalyzed reaction? b Compare optimum temperature of enzymes in human and thermophilic bacteria in a graph.	2+1	OR	Name any three groups of Protista with one salient feature and example of each group.	03																
(x)	In TACT theory of ascent of sap, how transpiration and adhesion help in process?	2+1	OR	Name and explain two hypotheses for evolution of single veined leaves.	03																
(xi)	Complete the table: <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <thead> <tr> <th style="width: 5%;"></th> <th style="width: 20%;">Phylum</th> <th style="width: 30%;">Distinguishing character</th> <th style="width: 45%;">Example</th> </tr> </thead> <tbody> <tr> <td>a</td> <td>Cnidarian</td> <td></td> <td></td> </tr> <tr> <td>b</td> <td></td> <td>Metameric segmentation</td> <td></td> </tr> <tr> <td>c</td> <td></td> <td></td> <td>Snail</td> </tr> </tbody> </table>		Phylum	Distinguishing character	Example	a	Cnidarian			b		Metameric segmentation		c			Snail	03	OR	Life cycle of fern is shown in diagram: a Name generations P and Q. b Which processes are shown by X and Y? c Which generation is dominant in ferns?	03
	Phylum	Distinguishing character	Example																		
a	Cnidarian																				
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(xii)	Write causative agent of cotton leaf curl disease. Also write symptoms and treatment of disease.	03	OR	Write down the mechanism of translocation in plants.	03																
(xiii)	What are xerophytes? Enlist any four adaptations for their habitat. Also give example.	03	OR	How is dermis of skin involved in first line of defence?	03																
(xiv)	Name two growth promoter and one growth inhibitor in plants with one major effect of each on plant body.	03	OR	Write mechanism of irreversible non-competitive enzyme inhibition with an example.	03																

## SECTION – C (Marks 26)

Attempt the following questions.

Q.3	Spermatophytes are seeded plants. How did seeds evolve?	06	OR	How are influx and efflux of potassium ions involved in regulating opening and closing of stomata? Explain in detail.	3+3
Q.4	Explain mechanical and chemical digestion in human stomach.	2+5	OR	Describe the structure and functions of Golgi complex. Also draw its diagram.	2+4+1
Q.5	Give a detailed account of general characteristics of class Aves.	06	OR	Explain steroids and prostaglandins as important group of lipids. Describe their roles in living organisms.	3+3
Q.6	Bacteria show para sexuality. Explain transduction and transformation. Also draw diagrams showing processes.	5+2	OR	What is an electro cardio gram? Explain its different components. Also draw a neat sketch.	1+5+1