

BIOLOGY HSSC-II

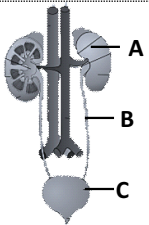
Time allowed: 2:35 Hours

Total Marks Sections B and C: 68

SECTION – B (Marks 42)

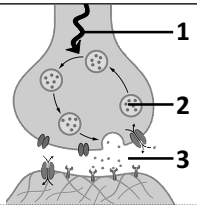
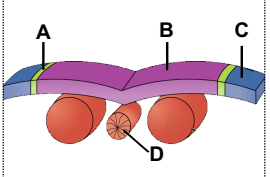
Q. 2 Answer the following questions briefly.

14x3=42

(i)	If people do not have ligaments, what would happen to them? Compare tendons with ligaments.	1+2	OR	Explain the role of bacteria in nitrogen cycle.	03
(ii)	<p>Complete the concept map by using the given terms:</p> <ul style="list-style-type: none"> • Neurons • Cell body • Neurotransmitter • Axon • Dendrites • Synapse 	03	OR	<p>Identify the organs A, B and C in the figure of the urinary system. Write function of each as well.</p> 	03
(iii)	Dead S-strain bacteria injected into mice did not harm the mice; but when mixed with living non-virulent R-strain bacteria, it killed them. Why?	03	OR	A colour-blind father has a daughter with normal vision. The daughter marries a man with normal vision. What is the probability of her children to be colour-blind? Explain with the help of pedigree chart.	03
(iv)	Describe the path an oxygen molecule takes as it travels from nose to body cell. (Enlist each structure of respiratory system through which it passes.)	03	OR	What is gene mutation? Briefly explain the causes and symptoms of Sickle cell anaemia as an example.	1+2
(v)	What are the functions of male reproductive system? What might happen to sperm production if a male has a high fever?	2+1	OR	How is sewage treated? (Write down the three stages of sewage treatment process briefly.)	03
(vi)	Why is an embryo most vulnerable to drugs and other harmful substances taken by mother if it is between 2 to 7 weeks old? Also state how a foetus gets nourishment from mother.	03	OR	Differentiate between: I Nucleosome & Primosome II Heterochromatin & Euchromatin III Sense codon & Non Sense codon	03
(vii)	How would the inheritance pattern of an X linked dominant trait be different from that of X linked recessive trait?	03	OR	"Migration may increase or decrease the effect of selection." Comment on the statement.	03
(viii)	How does inheritance of homologous and analogous structures result in convergent and divergent evolution?	03	OR	What is animal husbandry? Briefly state the role of livestock in national economy.	1+2
(ix)	Discuss the role of microbes in industrial production.	03	OR	Draw a flow chart to show how hormones control the function of male reproductive cycle.	03
(x)	Briefly explain the process of gene amplification through PCR (Polymerase Chain Reaction).	03	OR	Briefly explain polygenic inheritance.	03
(xi)	Compare the anchorage dependent and anchorage independent techniques of animal cell culture.	03	OR	How inhaled air in the respiratory tract is cleaned before it reaches the lungs? Describe briefly.	03
(xii)	Briefly explain haematoma formation. How is callus made during repair of bone structure?	1+2	OR	What is drug addiction? Write down any two effects of drug addiction on central nervous system (CNS).	1+2
(xiii)	How kidneys help in maintaining homeostasis in the body? (Write role of kidney briefly)	03	OR	Briefly explain the principle and process of Gel electrophoresis.	03
(xiv)	Describe the antagonistic effect of insulin and glucagon.	03	OR	Briefly explain any three methods of plant breeding for crop improvement.	03

SECTION – C (Marks 26)

Note: Attempt the following questions.

Q.3	The diagram shows how neurons communicate. Name the process and identify the parts 1, 2 & 3. Explain the whole process in detail.	2+4	OR	What is meant by innate behavior? Describe different types of orientation and non-orientation behavior with examples.	1+5											
																
Q.4	The diagram shows the neurulation in human embryo. Identify the labelled parts and state events of neurulation. Enlist the structures derived from neural crest cells.	2+4+1	OR	Describe the components of recombinant DNA technology under the following headings:	07											
																
				<table border="1" style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td style="width: 20%;">(i)</td> <td>Gene of interest</td> </tr> <tr> <td>(ii)</td> <td>Molecular scissor</td> </tr> <tr> <td>(iii)</td> <td>Molecular glue</td> </tr> <tr> <td>(iv)</td> <td>Molecular carrier</td> </tr> <tr> <td>(v)</td> <td>Expression system</td> </tr> </tbody> </table>	(i)	Gene of interest	(ii)	Molecular scissor	(iii)	Molecular glue	(iv)	Molecular carrier	(v)	Expression system		
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Q.5	Why multiple alleles provide many different phenotypes for a trait? Explain with the help of ABO blood group system.	06	OR	Explain ecological succession. Write in detail about kinds of succession.	2+4											
Q.6	Describe the mechanism of breathing in humans. How is breathing controlled? Explain in detail.	5+2	OR	Discuss the concept of genetic drift. Also describe speciation and different modes of speciation.	3+4											

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Q. 2 Answer the following questions briefly.

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(i)	Describe the structure of rib cage. Briefly explain the advantages of having some ribs that are not attached directly to sternum.	2+1	OR	What is the function of nephron? How is the rate of blood filtration with in the Bowman's capsule affected if blood pressure in the afferent arteriole is decreased?	2+1
(ii)	People with type I diabetes do not produce any insulin. What effect would it have on cells and metabolisms if left untreated?	03	OR	Identify and describe the three different processes involved in embryonic development.	03
(iii)	The given pedigree shows a particular trait. Analyse the pedigree and draw conclusion.	03	OR	What are chromosomes and genes? How are they related?	03
(iv)	In Griffiths experiment, do you think the heat treatment that killed the bacteria also inactivated the bacterial DNA? Why or why not?	03	OR	Differentiate between convergent and divergent evolution on the basis of inheritance of homologous and analogous structure.	03
(v)	Why is nasal breathing generally considered superior to mouth breathing? Also write down sequence of muscle contraction that takes place during inhalation and exhalation.	1+2	OR	Compare Klinefelter syndrome with Turner's syndrome with reference to Karyotype, Cause and Symptoms.	03
(vi)	FSH and LH get their names from events of female reproductive cycle but they also function in males. How their functions are similar in female and male?	03	OR	Briefly explain Darwin's theory of natural selection.	03
(vii)	Differentiate between A. Ammonification and denitrification B. Xerarch and hydarch succession	03	OR	Briefly explain Integrated disease management.	03
(viii)	Briefly describe the procedure for the construction of Genomic library.	03	OR	Compare and contrast the sympathetic and para sympathetic nervous systems.	03
(ix)	Briefly describe the following terms: A. Genetic marker B. Genomics C. Genome maps	03	OR	Local anaesthesia blocks the opening of sodium channels in the nerve cells. How this would affect the transmission of pain impulses? Explain briefly.	03
(x)	Why biomass present at one trophic level of an ecosystem decreases at higher trophic level? Explain briefly.	03	OR	How is it possible for a child to have a blood group O if the parents have blood group A and B.	03
(xi)	Write down any three applications of DNA analysis.	03	OR	What is meant by home gardening? List at least four benefits of home gardening?	1+2
(xii)	State Mendel's law of segregating. Make a cross between round seed and wrinkled seed pea plant.	1+2	OR	What are the three major steps in sequencing of DNA?	03
(xiii)	What is epistasis? How is it different from dominance?	1+2	OR	Briefly explain characterises of Growth, Distribution and Carrying capacity of a population.	03
(xiv)	Briefly explain the role of vaccination as an effective method of preventing infectious diseases.	03	OR	A plant with yellow flower was crossed with a plant with red flowers. The F1 progeny obtained had orange flowers. What is the inheritance pattern? Explain briefly.	03

SECTION – C (Marks 26)

Note: Attempt the following questions.

Q.3	Identify the labelled parts and correlate these with major events of foetus development in the first trimester.			Identify the labelled parts E, F, G and H. Write down the major events of menstrual cycle in human females.	
		2+4	OR		(2+4)
Q.4	Explain Habituation, Conditioning, Latent learning and insight learning by giving examples from human behaviours.	07	OR	How is the information present in DNA used for the synthesis of RNA? Explain in detail. Also list down the post transcriptional modifications of mRNA.	5+2
Q.5	What are the two methods used for gene therapy? Explain the role of successful gene therapy for cystic fibrosis.	2+4	OR	Why anterior lobe of pituitary gland is called master gland? Enlist the hormones produced by anterior gland. Write down the functions of each hormones as well.	1+2+3
Q.6	Describe the transport of oxygen and carbon dioxide through blood in humans.	07	OR	Explain in detail the Sliding filament model of muscle contraction.	07