



## BIOLOGY HSSC-II SECTION – A (Marks 17)

Time allowed: 25 Minutes

Section – A is compulsory. All parts of this section are to be answered on this page and handed over to the Centre Superintendent. Deleting/overwriting is not allowed.

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Do not use lead pencil.

حصہ اول لازمی ہے۔ اس کے جوابات اسی صفحہ پر دئے کرنا علم مرکز کے حوالے کریں۔ کات کر دو ہمارے لکھنے کی اجازت نہیں ہے۔ سیاہ پینسل کا استعمال ممنوع ہے۔

Version No.			
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ROLL NUMBER					

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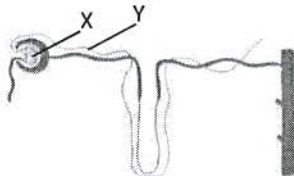
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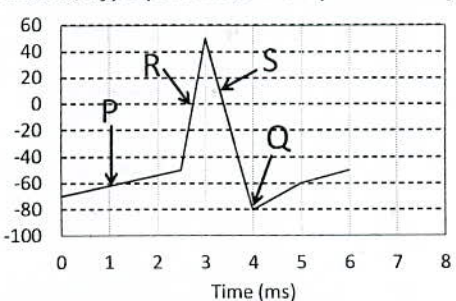
Answer Sheet No. \_\_\_\_\_

ہر سوال کے سامنے دیئے گئے، کریکولم کے مطابق درست دائرہ کو پر کریں۔  
Invigilator Sign. \_\_\_\_\_

Fill the relevant bubble against each question according to curriculum:

Candidate Sign. \_\_\_\_\_

Question	A	B	C	D	A	B	C	D
1. A snail was moving on a table. When the table was tapped snail stopped moving. When tapping was done repeatedly, snail stopped responding to it. Identify the type of behavior shown.	Imprinting	Habituation	Innate	Instinct	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Due to lightning, a forest was set on fire and destroyed. The type of succession which will occur then is termed as:	Xerarch	Secondary	Hydrarch	Primary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Which one is a steroid hormone?	Adrenaline	Parathormone	Insulin	Aldosterone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. The following diagram shows nephron. Identify the processes which occur at X and Y. 	Selective Reabsorption, Ultrafiltration	Diffusion, Tubular secretion	Ultrafiltration, Selective Reabsorption	Active Transport, Selective Reabsorption	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Which of the following steps are involved in inhalation? I. Diaphragm contracts II. Rib cage lowers III. External intercostal muscles contract IV. Pressure in lungs decreases	II, III, IV	I, III, IV	I, II, IV	I, II, III	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. The workers in a honey bee hive exhibit:	Aggregation	Territoriality	Altruism	Dominance Hierarchy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Question	A	B	C	D	A	B	C	D
<p>7. In the given figure of action potential in a Neuron, hyperpolarization is represented by:</p> 	Q	R	S	P	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Which one of the following is <b>NOT</b> a Sexually Transmitted Disease?	Gonorrhoea	Syphilis	AIDS	Measles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. The extra embryonic membrane which provides a fluid filled environment for developing fetus is:	Chorion	Allantois	Yolk sac	Amnion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. In pea plant, round and wrinkled seed shape is controlled by R and r alleles respectively. The cross which will give rise 1:1 ratio of both phenotypes can be:	Rr x Rr	Rr x RR	Rr x rr	RR x rr	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. Baldness is more common in males than in females because it is a:	Sex influenced trait	Sex limited trait	Y- linked trait	Sex linked recessive trait	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. In DNA replication, the primer:	Consists of few DNA nucleotides	Helps to unwind DNA double strand	Prevents DNA strands to pair up	Is a short segment of RNA nucleotides	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. After successful implantation of blastocyst into endometrium of uterus, level of which hormone increases?	Human chorionic gonadotrophin	Luteinizing hormone	Oxytocin	Progesterone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. Normally vaccination can be done at any age for:	Measles	Hepatitis	Diphtheria	Polio	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. According to Hardy Weinberg Theorem, which one of the following factor cannot change allelic frequency?	Mutation	Random mating	Selection	Gene flow	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. Restriction endonucleases can be used in Genetic Engineering to:	Produce cDNA	Cut plasmid DNA	Join DNA at sticky ends	Clone DNA	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. In Nitrogen cycle, conversion of Nitrates into nitrogen is termed as:	Ammonification	Assimilation	Denitrification	Nitrification	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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ROLL NUMBER					

**Time allowed: 2:35 Hours**

**Total Marks Sections B and C: 68**

**NOTE: Answer any fourteen parts from Section 'B' and any two questions from Section 'C'. Write your answers neatly and legibly.**

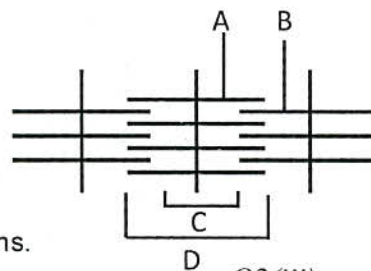
### SECTION – B (Marks 42)

**Q. 2 Attempt any FOURTEEN parts. All parts carry equal marks. ( 14 x 3 = 42)**

- (i) Compare the mechanism of osmoregulation in Marine and Fresh water animals.
- (ii) How are 'Counter Current Multiplier' mechanism and 'hormones' involved in concentrating urine?
- (iii) The diagram shows structure of a Sarcomere.

a. Label the parts A, B, C, and D

b. Mention the changes in C and D in a contracted sarcomere

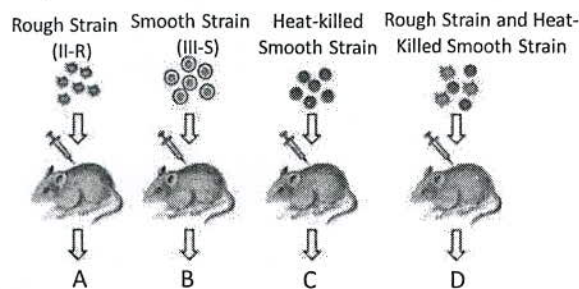


- (iv) Enlist the cells associated with bones. Also write their respective functions.
- (v) Differentiate between two types of Neurotransmitters. Also give one example of each. Q2(iii)
- (vi) Limbic system lies under cerebrum. Write down its parts and their functions.
- (vii) A man and a woman with blood groups A and B respectively have four children all with different blood groups of ABO system. By a cross show genotypes of both parents and offsprings.
- (viii) XO-XX is a pattern of sex determination. Explain with example.

(ix) Write about the causes and symptoms of Phenyl Ketonuria.

(x) An experiment is shown in the diagram.

- a. Who performed this experiment and why?
- b. Write down the result of experiments A-D



- (xi) Briefly explain any three characteristics of Genetic Code. Q2(x)
- (xii) What is Speciation? Briefly explain Sympatric Speciation?
- (xiii) What is Divergent Evolution? Explain with a suitable example.
- (xiv) How does Endosymbiont hypothesis explain evolution of Eukaryotes from Prokaryotes?
- (xv) Population have many characteristics. Write about any three characteristics.
- (xvi) Enlist the sources of Chloroflouro Carbons (CFCs). How do they cause Ozone Depletion?
- (xvii)
  - a. What is the role of CFTR gene in a normal person?
  - b. Write down symptoms of Cystic Fibrosis.
  - c. Write mechanism of Gene Therapy used to cure Cystic Fibrosis.
- (xviii) Elaborate the role of Microbes in Food Processing by giving any three examples.
- (xix) Write about two major techniques of animal cell culture.
- (xx) What are Acclimatization and Selection? How do they help to improve crops?

### SECTION – C (Marks 26)

**Note: Attempt any TWO questions. All questions carry equal marks. ( 2 x 13 = 26 )**

**Q. 3** a. Describe stages of Menstrual Cycle in Human Female. Also draw the diagram outline.  
 b. Explain Latent Learning with example.

**Q. 4** a. Write the names and functions of hormones produced by Thyroid Gland. Write about the problems related with abnormal secretion of hormones in different stages.

b. Explain events of Gastrulation in Human. Also draw the diagram.

**Q. 5** a. Describe the mechanism of DNA Analysis using Restriction Fragment Length Polymorphism (RFLP).  
 b. How is Carbon Dioxide transported through blood as Bicarbonate ions? Explain in detail.



**BIOLOGY HSSC-II**  
**SECTION – A (Marks 17)**

Time allowed: 25 Minutes

Section – A is compulsory. All parts of this section are to be answered on this page and handed over to the Centre Superintendent. Deleting/overwriting is not allowed. Do not use lead pencil.

حصہ اول لازمی ہے۔ اس کے جوابات اسی صفحہ پر دے کر نام مرکز کے حوالے کریں۔ کاٹ کر دوہار  
کھینچنے کی اجازت نہیں ہے۔ سیاہ پینسل کا استعمال ممنوع ہے۔

Version No.			
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ROLL NUMBER					

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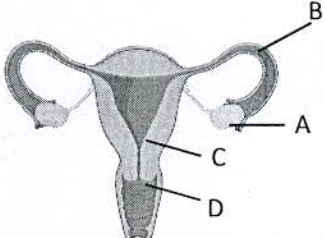
Answer Sheet No. \_\_\_\_\_

ہر سوال کے سامنے دیے گئے، کریکولم کے مطابق درست دائرہ کو پر کریں۔ Invigilator Sign. \_\_\_\_\_

Fill the relevant bubble against each question according to curriculum: Candidate Sign. \_\_\_\_\_

Question	A	B	C	D	A	B	C	D
1. Which of the following events occur during exhalation? I. Diaphragm relaxes II. Rib cage lowers III. External intercostal muscles contract IV. Pressure in lungs Increases	I, II, III	II, III, IV	I, III, IV	I, II, IV	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. If body is overheated, the body temperature can be regulated by:	More sweating, vasoconstriction	Less sweating, vasodilation	Less sweating, vasoconstriction	More sweating, vasodilation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Which part of Limbic system is involved in long term memory formation?	Cerebellum	Hippocampus	Amygdala	Hypothalamus	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. The type of Agonistic behavior exhibited by mountain gorilla is:	Dominance hierarchy	Altruism	Territoriality	Instinct	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Which one is a Sexually Transmitted Disease?	Syphilis	Measles	Polio	Tetanus	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Leydig cells found in testes are involved in secretion of:	Inhibin	Testosterone	Luteinizing hormone	Nutrients	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. All of the following are examples of Reflex Action EXCEPT:	Blinking of eyelids in bright light	Pulling hand away from hot object	Sneezing on tickling nose	Picking pen to write name	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. When true breeding red and white flowering plants were crossed, all pink offsprings were produced. When these pink flowered plants were self crossed, the percent of pink flowering offsprings would be:	25%	50%	75%	100%	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. During translation, the amino acyl t-RNA complex attaches to small ribosomal unit at:	P site	E site	mRNA	A site	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. Hemophilia is more common in males than in females because this trait is:	Y-linked recessive	Sex influenced	Sex limited	Sex linked recessive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Question	A	B	C	D	A	B	C	D
11. A female having 44+ XO chromosome, webbed neck and large number of moles is suffering from:	Turner syndrome	Down syndrome	Kilnefelter syndrome	Sickle cell anaemia	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. The ability of a particular environment that can support maximum individuals is termed as:	Uniform distribution	Clumped distribution	Carrying capacity	Density	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. All of the following are Stop Codons EXCEPT:	UGA	UAG	UAA	AUG	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. Identify the part where fertilization of ovum occurs. 	A	B	C	D	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. To prove DNA replication is semi conservative, Meselson and Stahl labelled DNA with $N^{15}$ , DNA sample appeared heaviest which was collected after.	0 minutes	20 minutes	40 minutes	60 minutes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. Which type of behaviour helps animals with short life span to live successfully?	Learning	Innate	Imprinting	Altruism	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. All are characteristics of Haemoglobin EXCEPT:	Has more affinity with oxygen	Loses oxygen at $PO_2$ 60mmHg	Transports oxygen	Has four iron atoms in molecule	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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# BIOLOGY HSSC-II

Time allowed: 2:35 Hours

Total Marks Sections B and C: 68

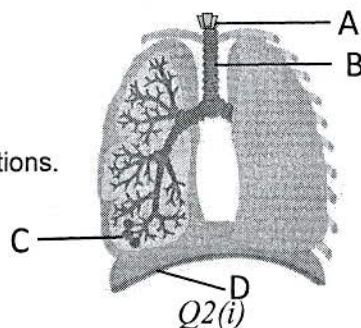
NOTE: Answer any fourteen parts from Section 'B' and any two questions from Section 'C'. Write your answers neatly and legibly.

## SECTION – B (Marks 42)

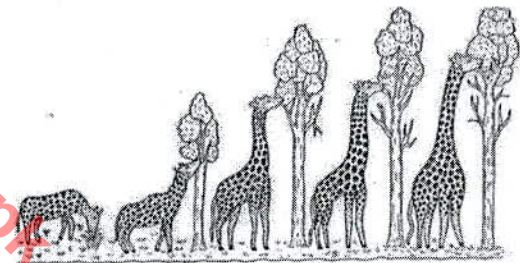
Q. 2 Attempt any FOURTEEN parts. All parts carry equal marks.

( 14 x 3 = 42)

- (i) Diagram shows human respiratory system.
  - a. Identify the labelled parts A, B, C and D
  - b. Write functions of parts C and D
- (ii)
  - a. Write down the two specific symptoms of Sinusitis.
  - b. Enlist divisions of Autonomic Nervous System and write their functions.
- (iii) Write about the role of Na<sup>+</sup> and K<sup>+</sup> ions in maintaining Resting Membrane Potential.
- (iv) Briefly describe any three problems leading to Female Infertility.
- (v) What is Habituation? Explain with the example of squirrel.
- (vi) Write about the methods of Regulation of Gene Expression.
- (vii) What is meant by Non-Conventional energy source? Enlist any three Non-Conventional Energy sources. What is their advantage to use?
- (viii) Write names of the layers present in Uterine wall. Also write their structure and functions.
- (ix) Elaborate the role of Foetal Hormones in birth process.
- (x) The blood groups of father and mother are AB and O respectively. Write genotypes of parents and offspring by making a cross.
- (xi) XY-XX is a pattern of Sex Determination. Explain this pattern by giving example.
- (xii) Write about any three factors which can change Allelic Frequency of a population.
- (xiii) What is Convergent Evolution? Explain with an example.
- (xiv)
  - a. Which theory of evolution is depicted in figure and who proposed it?
  - b. Enlist the main points of this theory?
- (xv) Briefly explain different methods of Nitrogen Fixation.
- (xvi) Enlist any three causes and effects of Acid Rain.
- (xvii) Which properties should a vector have in it? Why it is used in Genetic Engineering.
- (xviii) How does Vaccination help in controlling Hepatitis?
- (xix) Write role of Hybridization and Back Cross to improve crops.
- (xx) Briefly explain steps of Polymerase Chain Reaction.



Q2(i)



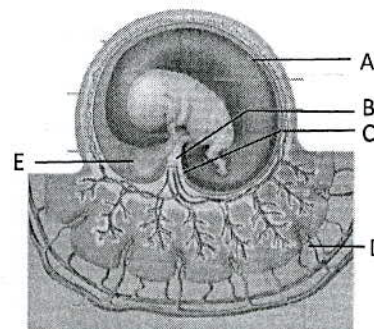
Q2(xiv)

## SECTION – C (Marks 26)

Note: Attempt any TWO questions. All questions carry equal marks.

( 2 x 13 = 26 )

- Q. 3
  - a. Write names and functions of hormones released by Anterior Pituitary Gland which affect growth and metabolism. Also explain problems related to their abnormal secretion.
  - b. Ammonia and urea are excretory products. How is their excretion is related to habitat? Also give examples.
- Q. 4
  - a. Why is Sanger's method of DNA Sequencing called Dideoxy Method? Explain its procedure.
  - b. In the given diagram:
    - (i) Label the parts A, B, C, D, and E. Also write their functions
    - (ii) How is part D made? What is its role?
    - (iii) Which type of blood vessels are present in part B?
- Q. 5
  - a. The transcribed mRNA in eukaryotes is changed and modified before translation. Explain how it occurs. Also give reasons for the changes.
  - b. Describe the steps of Bone Repair after Simple Fracture.



Q4(b)