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Answer Sheet No. _____

Sign. of Candidate _____

Sign. of Invigilator _____

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.

BIOLOGY HSSC-II
SECTION – A (Marks 17)
Time allowed: 25 Minutes

حصہ اول لازمی ہے۔ اس کے جوابات اسی صفحہ پر دے کر ناظم مرکز کے حوالے کریں۔ گات کردہ بارہ لکھنے کی اجازت نہیں ہے۔ لیڈ پنسل کا استعمال ممنوع ہے۔

ہر سوال کے سامنے دیے گئے درست دائرہ کو پر کریں۔

Fill the relevant bubble against each question:

- A man has hemophilia. Which statement correctly describes the inheritance of this gene?
 - He inherited the recessive allele from his mother.
 - He inherited the dominant allele from his father.
 - He can pass the recessive allele to a son.
 - He can pass the dominant allele to a daughter.
- When a frog flips out its tongue to catch an insect flying past, it is showing which type of behavior?
 - Learned behavior
 - Territoriality
 - Courtship behavior
 - Innate behavior
- When the pituitary gland releases human growth hormone GH, what is the effect on the liver?
 - Stimulates the pituitary gland to release GH
 - Stimulates the liver to convert glycogen into glucose
 - Stimulates the liver to store glucose
 - Decreases sugar level in blood
- Which of the following would increase the rate of heat exchange between an animal and its environment?
 - Feather or Fur
 - Vasoconstriction
 - Wind blowing across the body surface
 - Counter current heat exchange
- Homeostasis of blood osmotic pressure is maintained by which organ(s)?
 - Lungs
 - Kidneys
 - Heart
 - Liver
- Emphysema is a condition that results in the destruction of alveoli in the lungs? What effect would this have on the body?
 - Lower levels of oxygen in the blood
 - Higher levels of oxygen in the blood
 - Lower levels of carbon dioxide in the blood
 - No effect
- Immediate source of energy for muscle contraction is:
 - Glucose
 - GTP
 - ATP
 - Creatine phosphate
- Reflex action below the neck are under control of:
 - Brain
 - Spinal cord
 - Hypothalamus
 - Pituitary
- Glands of male reproductive system in human are:
 - Prostate, Seminal vesicles
 - Prostate, Corpus luteum
 - Prostate, Placenta
 - Corpus luteum, Seminal vesicles
- A structure which is made up of both foetus and maternal tissue is known as:
 - Placenta
 - Umbilical cord
 - Amnion
 - Allantois

11. Which one is a sex-limited trait? Beard growth Baldness Haemophilia tfm

12. Production of more individuals than environment can lead to: Struggle for existence Survival of fittest Natural selection Evolution

13. Which of the following is environmental buffer? Wild life Lichens Herbs Forests

14. A genome is a full set of genes in an: Individual Population Community Biosphere

15. Study of proper utilization of economically important domesticated animal is known as: Animal Husbandry Wild life management Hybrid breeding Livestock management

16. Seminiferous tubule grows into: Epididymis Vas deference Urinary bladder Urethra

17. The change of behavior by life experiences is called: Instinct Maturation Learning Imprinting

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BIOLOGY HSSC-II

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Time allowed: 2:35 Hours

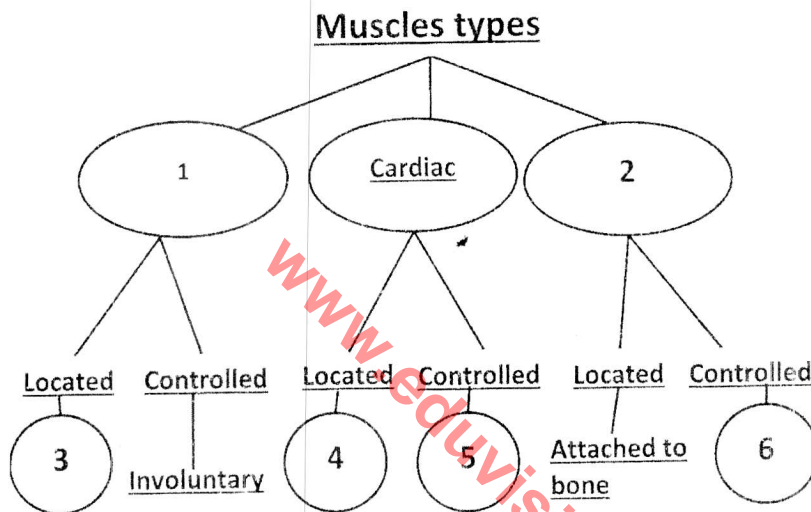
Total Marks Sections B and C: 68

NOTE: Answer any fourteen parts from Section 'B' and any two questions from Section 'C'. Use supplementary answer sheet i.e. Sheet-B if required. Write your answers neatly and legibly. Statistical table will be provided on demand.

SECTION – B (Marks 42)

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

- (i) If an injury tore a small hole in the membrane surrounding lungs? What effect on lungs function is expected?
- (ii) If blood pressure in the afferent arteriole leading to glomerulus decreased, how would the rate of blood filtration within Bowman's capsule be affected? Explain briefly.
- (iii) Complete the concept map to compare different types of muscles. (Label 1 – 6)



- (iv) Describe the basic pathway of information flow through neurons that causes one to turn one's head when someone calls their name.
- (v) Critically analyze the inheritance of hemophilia, colorblindness and muscular dystrophy.
- (vi) What is corpus luteum? Briefly explain its role in menstrual cycle.
- (vii) List some changes that occur at cellular level during aging.
- (viii) Why the length of mRNA formed in Eukaryotes shortens when it goes to cytoplasm for translation? How its message is protected?
- (ix) How atmospheric nitrogen is fixed to be utilized by plants?
- (x) What is succession? How might the early species help the arrival of late species?
- (xi) What is the basic principle of Gel Electrophoresis? Write down its two applications.
- (xii) Write down three main steps involved in any DNA sequencing method.
- (xiii) How are microbes utilized for energy production?
- (xiv) Explain XO – XX type of sex determination with the help of an example.
- (xv) List the hormones of anterior pituitary gland.
- (xvi) What is a vaccine? Give its importance.
- (xvii) Write three main causes of male infertility in humans.
- (xviii) Name the three germ layers. Which body organs are derived from these germ layers?
- (xix) Draw and label the water cycle.
- (xx) Describe the structure and function of voice box in humans.

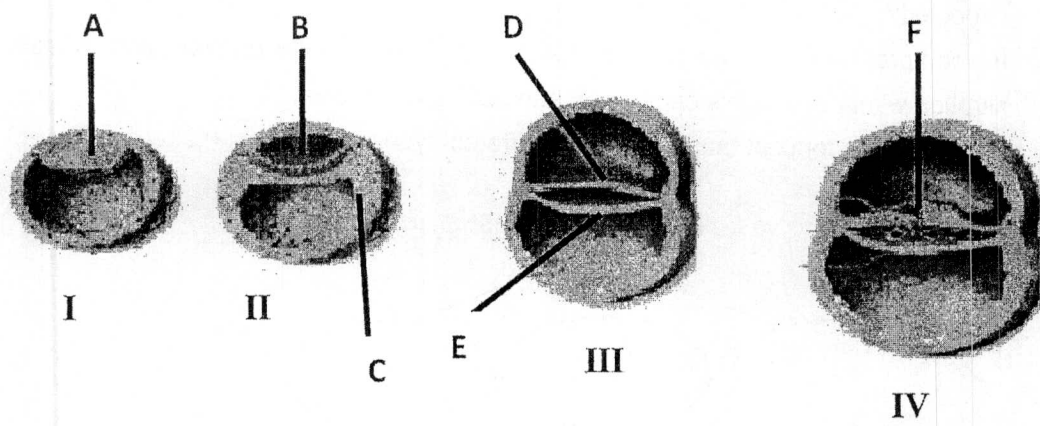
SECTION – C (Marks 26)

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

(2 x 13 = 26)

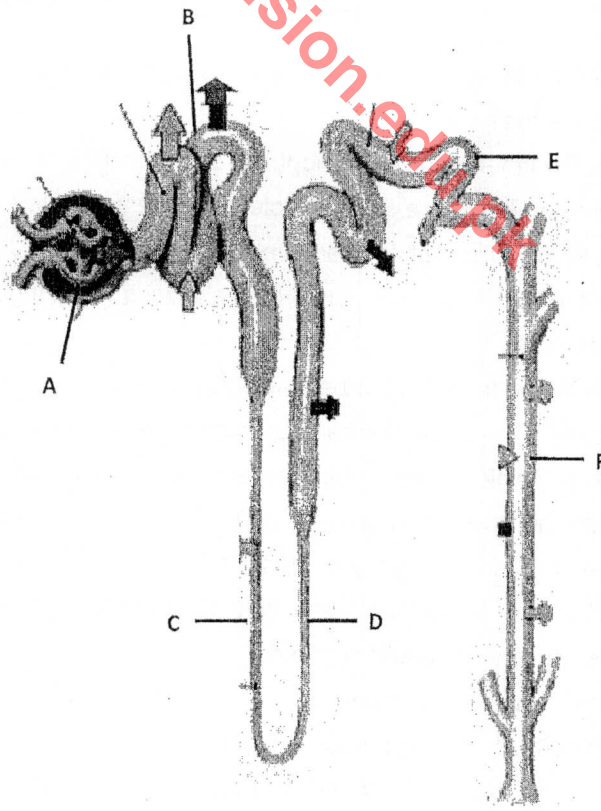
- Q. 3** a. How a piece of DNA is amplified through PCR? Explain the process in detail. (07)
 b. Describe techniques for the improvement of yield in crops and fruits. (06)

- Q. 4** a. Below is the figure showing gastrulation in humans. Identify the labelled parts A – F. What role does gastrulation play in the specialization of cell types common to most multicellular animals? (04)



- b. How the process of gastrulation takes place in humans? (05)
 c. Why are there so many variations of grain color in wheat? Explain. (04)

- Q. 5** a. Explain the process of repair of simple fracture of bone. (04)
 b. Below is the figure of nephron.



- (i) Identify the labelled parts A – F. (03)
 (ii) Explain the process of urine formation. (06)

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Answer Sheet No. _____

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BIOLOGY HSSC-II
SECTION - A (Marks 17)
Time allowed: 25 Minutes

حصہ اول لازمی ہے۔ اس کے جوابات اسی صفحہ پر دے کر ناظم مرکز کے حوالے کریں۔ کٹ کر دوبارہ لکھنے کی اجازت نہیں ہے۔ ایڈمنسٹریٹو استعمال ممنوع ہے۔

ہر سوال کے سامنے دیے گئے درست دائرہ کو پر کریں۔

Fill the relevant bubble against each question:

1. Which tRNA can bind at mRNA Condon UAC? tRNA with anticodon ACU tRNA with anticodon AUG tRNA with anticodon TGA tRNA with anticodon TCU
2. If a man of M blood group marries a woman of N blood group, all their children will have: M blood group N blood group O blood group MN blood group
3. Which of the following structures produce the fluid protein of semen? Seminal vesicles, Bulbourethral gland, Prostrate gland Seminal vesicles, Bulbourethral gland, Bladder Seminal vesicles, Urethra, Bladder Testes, Bulbourethral gland, Bladder
4. What does the cat show when it runs for its food dish upon hearing the food can opener? Insight learning Conditioning Habituation Imprinting
5. What type of heat exchange is promoted by vasodilation? Convection Conduction Evaporation Radiation
6. All of the following contain cartilage EXCEPT: Larynx Bronchi Trachea Bronchioles
7. A trait whose alleles are present in both male and female but expresses more in one sex than other: Sex linked trait Sex influenced trait Sex limited trait Y linked trait
8. Organism of same species inhabiting in space and time form a: Population Species Community Biosphere
9. The present giraffe has a long neck as compared to its ancestors. Lamarck believed it could be due to: Natural selection Inheritance of acquired characters Isolation Speciation
10. Crumpled leaves like structure are found in _____ stage of xerarch succession. Crustose lichen Foliose-lichen Moss Herbaceous

11. Myoglobin occurs in: Blood Liver Spleen Muscles
-
12. $Na^+ - K^+$ ATPase pump is important for: Maintenance of Resting membrane potential Massive out flux of K^+ after depolarization Recovery of resting potential Conversion of resting potential into action potential
-
13. Ovulation is stimulated by the sharp increase of which of the following hormones? FSH Estrogen LH Progesterone
-
14. Specific sequences four or six nucleotides arranged symmetrically in reverse order where restriction enzyme works are known as: Okazaki Fragment Palindromic Sequences Promotor Sequences Primer
-
15. During PCR which enzyme is used to do polymerization of DNA fragments? RNA polymerase DNA polymerase Taq polymerase DNA ligase
-
16. The pancreas releases which of the following hormones? Epinephrine and Nor epinephrine GH and ADH Thyroxin and calcitonin Glucagon and insulin
-
17. Which of the following cells are involved in soft callus formations during repair of bones? Osteoblast Osteoclast Osteocytes Chondrocytes

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BIOLOGY HSSC-II

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Time allowed: 2:35 Hours

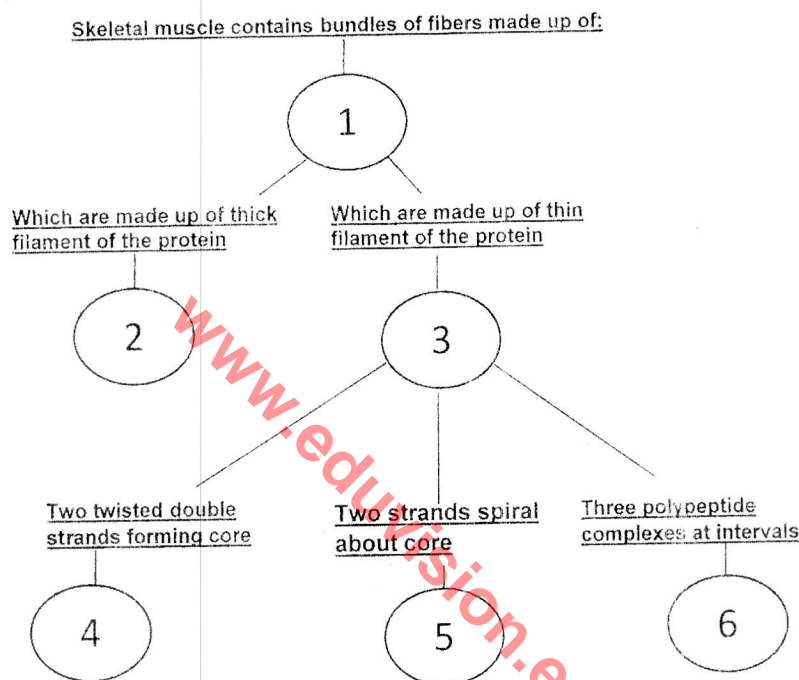
Total Marks Sections B and C: 68

NOTE: Answer any fourteen parts from Section 'B' and any two questions from Section 'C'. Use supplementary answer sheet i.e. Sheet-B if required. Write your answers neatly and legibly. Statistical table will be provided on demand.

SECTION - B (Marks 42)

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

- What advantage does uric acid offer as a nitrogenous waste in arid environment?
- Why is an internal location of gas exchange tissue advantageous for terrestrial animals? List properties of respiratory surfaces.
- Complete the concept map using the following terms: Actin, Myofibril, Myosin, Troponin, Tropomyosin, F. Actin (label 1 – 6)



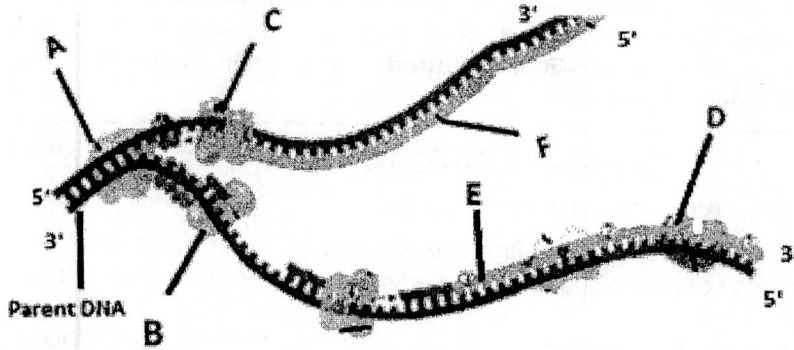
- Why is it nearly impossible to stop a reflex action from taking place? Write down the fundamental parts of a typical reflex arc.
- What are the phenotypes and genotypes of parents of a colorblind son and non-carrier daughter?
- What is miscarriage? What are the possible causes of miscarriage?
- Which types of cells have been proposed as fourth germ layer? What structures are derived from it?
- Differentiate between:
 - Intron and exon
 - Heterochromatin and Euchromatin
 - Nucleosome and Primosome
- Explain genetic drift. Write down its two causes.
- If a forest near a lake is cut down, how will the quality of water be damaged? Also list non-conventional energy sources.
- What is cystic fibrosis? How gene therapy is used to cure it?
- What is meant by tissue culture? Write about two techniques used for animal cell culture.
- Explain integrated disease management.
- Why is human male referred as heterogametic? Explain with the help of a cross.
- What are hormones? Give their classification on the basis of chemical nature.
- What are biological rhythms? How are they important to man?
- Write three causes of infertility in human females.
- What is cleavage? Write about two patterns of cleavage.
- What is ecological Pyramid? Explain any two types.
- Write any three roles of microbes in human welfare.

SECTION – C (Marks 26)

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

(2 x 13 = 26)

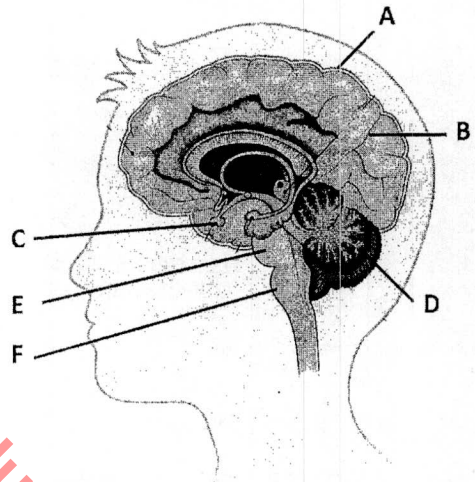
Q. 3 a. The given figure shows the process of DNA replication:



- (i) Identify the parts labeled as A, B, C, D, E, F. (03)
 - (ii) Write down the functions of A, B, C, D. (04)
 - (iii) DNA stability and variability are maintained during replication. Explain (02)
- b.** Explain the concept of multiple alleles giving ABO blood group as an example. (04)

Q. 4 a. Given figure is the architect of Human brain.

- (i) Identify the parts labelled as A, B, C, D, E, F. (03)
- (ii) Write down the three main parts of brain. (1.5)
- (iii) Give the functions of parts labelled as D, E, F. (4.5)



b. Albinism (lack of Pigment) in man is caused by a recessive gene. If normal parents have an albino child, what is the probability that their next child be normal for color. (04)

Q. 5 a. How are joints classified on the basis of their mobility? Write about any one common disorders of Skelton. (07)

b. The given figure shows a setup of for electrophoresis.

- (i) What is the principle behind working of this apparatus? (04)
- (ii) Why is it needed in experiments in biotechnology? (02)

