



Roll No.

Answer Sheet No. _____

Sig. of Candidate. _____

Sig. of Invigilator. _____

BIOLOGY HSSC-II

SECTION – A (Marks 17)

Time allowed: 25 Minutes

NOTE:- Section-A is compulsory and comprises pages 1-2. All parts of this section are to be answered on the question paper itself. It should be completed in the first 25 minutes and handed over to the Centre Superintendent. Deleting/overwriting is not allowed. Do not use lead pencil.

Q. 1 Circle the correct option i.e. A / B / C / D. Each part carries one mark.

- (i) The maximum speed of Nerve Impulse as recorded in humans is _____.
- A. 100 metres/second B. 110 metres/second
C. 120 metres/second D. 130 metres/second
- (ii) What are called the animals who lay shelled eggs to protect the developing embryo from harsh terrestrial conditions?
- A. Viviparous B. Ovoviviparous
C. Oviparous D. Metatherians
- (iii) Every protein starts with an amino acid methionine encoded by an initiation codon _____.
- A. UAA B. UGA
C. AUG D. UAG
- (iv) In a population with two alleles for a particular locus A and a, the allele frequency of A is 0.6. What would be the frequency of heterozygote if the population is in Hardy – Weinberg equilibrium?
- A. 0.36 B. 0.16
C. 0.24 D. 0.48
- (v) The term niche was first proposed in 1917 by Joseph Grinnell an American _____.
- A. Embryologist B. Ornithologist
C. Ecologist D. Physiologist
- (vi) During which phase of meiosis the Non-sister chromatids of homologous chromosome exchange their segments due to the formation of chiasmata?
- A. Pachytene B. Leptotene
C. Diplotene D. Diakinesis
- (vii) Which of the following is **NOT** a sex-linked disease in humans?
- A. Hypophosphatemia B. Colour-blindness
C. Sickle cell anemia D. Haemophilia
- (viii) When a haemophiliac carrier woman marries a normal man, who among her offspring may be affected?
- A. All her children B. All her daughters
C. Half of her daughters D. Half of her sons
- (ix) In an ecosystem, the second trophic level is constituted by the _____.
- A. Producers B. Decomposers
C. Primary consumers D. Secondary consumers
- (x) The enzyme luciferase is produced by an insect commonly called _____.
- A. Housefly B. Butterfly
C. Firefly D. Dragonfly



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' on the separately provided answer book. Use supplementary answer sheet i.e. Sheet-B if required. Write your answers neatly and legibly.

SECTION – B (Marks 42)

Q. 2 Attempt any FOURTEEN parts. The answer to each part should not exceed 3 to 4 lines. (14 x 3 = 42)

- | | | |
|---------|---|-----|
| (i) | Specify the part of nephron associated with each of the following functions: | |
| | a. Filtration b. Reabsorption c. Secretion | 03 |
| (ii) | Write down three methods for the excretion of waste materials in plants. | 03 |
| (iii) | Define Epistasis. | 03 |
| (iv) | a. What are the causes of rapid movement of leaflets of Mimosa plant? | 02 |
| | b. Define Nutation. | 01 |
| (v) | Define Synovial joints. List the types of synovial joints. | 03 |
| (vi) | a. With the help of graph, show the sequence of membrane potential changes associated with an action potential. | 02 |
| | b. What is the cause of Addison's disease? | 01 |
| (vii) | a. What is the importance of evolution of pollen-tube in Spermatophytes? | 1½ |
| | b. What is Parthenocarpy? Also write its cause. | 1½ |
| (viii) | How is birth controlled by maternal and foetal hormones in human female? | 03 |
| (ix) | Differentiate between Apical meristem and Lateral meristem. | 03 |
| (x) | What is DNA polymerase III ? Write down its main features. | 03 |
| (xi) | a. How is Phragmoplast formed? What is its importance for future daughter cells? | 02 |
| | b. Write briefly about Anaphase? | 01 |
| (xii) | What is Test cross? | 03 |
| (xiii) | Differentiate between Incomplete dominance and Codominance with examples. | 03 |
| (xiv) | a. What are the causes of insulin dependent diabetes mellitus? | 02 |
| | b. Write down the side effects of diabetes. | 01 |
| (xv) | What are the two primary goals of human genome project? | 03 |
| (xvi) | Show diagrammatically the two hypothesis on the evolution of Eukaryotic cell. | 03 |
| (xvii) | Differentiate between: | |
| | a. Population and Community b. Autecology and Synecology | 1+1 |
| | c. Biotic components and Abiotic components | 01 |
| (xviii) | Define Succession. Differentiate between Primary Succession and Secondary Succession. | 03 |
| (xix) | a. What is Acid rain? | 01 |
| | b. Write any four damages caused by acid rain. | 02 |

SECTION – C (Marks 26)

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

- | | | | |
|------|----|---|-------|
| Q. 3 | a. | Describe the structure and function of the different parts of human Brain. Also draw the diagram. | 6+2 |
| | b. | Define Synapse. How does a nerve impulse communicate across a synapse? | 1+2+2 |
| Q. 4 | a. | Describe the developmental process of chick. | 09 |
| | b. | What is meant by Abnormal development? Write down its causes. | 04 |
| Q. 5 | a. | How can you get multiple copies of a gene by recombinant DNA technology? | 09 |
| | b. | How is the SCID Syndrome cured by gene therapy? | 04 |



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

Time allowed: 25 Minutes

NOTE:- Section–A is compulsory and comprises pages 1-2. All parts of this section are to be answered on the question paper itself. It should be completed in the first 25 minutes and handed over to the Centre Superintendent. Deleting/overwriting is not allowed. Do not use lead pencil.

Q. 1 Circle the correct option i.e. A / B / C / D. Each part carries one mark.

- (i) Which of the following joints allow free movement and contain a cavity filled with fluid?
- | | |
|-------------------|-------------------------|
| A. Fibrous Joints | B. Cartilaginous Joints |
| C. Pivot Joints | D. Synovial Joints |
- (ii) Edward syndrome is because of trisomy of _____ chromosome pair.
- | | |
|-------|-------|
| A. 12 | B. 13 |
| C. 18 | D. 21 |
- (iii) The study of Aging is called _____.
- | | |
|----------------|------------------|
| A. Gerontology | B. Palaeontology |
| C. Ethology | D. Teratology |
- (iv) Sickle cell disease is a mutation that replaces a single thymine with a/an _____.
- | | |
|-------------|------------|
| A. Adenine | B. Guanine |
| C. Cytosine | D. Uracil |
- (v) The endosymbiont hypothesis was first proposed by _____.
- | | |
|------------------|---------------------|
| A. Malthus | B. Carolus Linnaeus |
| C. Lynn Margulis | D. Lyell |
- (vi) Which of the following is included in Macronutrients?
- | | |
|---------|------------|
| A. Iron | B. Sulphur |
| C. Zinc | D. Iodine |
- (vii) When a single gene affects two or more traits, the phenomenon is called _____.
- | | |
|-----------------|-----------------|
| A. Epistasis | B. Pleiotropy |
| C. Co-dominance | D. Gene linkage |
- (viii) In 1958 A.D, F.C.Steward grew a complete carrot plant from a tiny piece of _____.
- | | |
|-------------|--------------|
| A. Xylem | B. Phloem |
| C. Meristem | D. Mesophyll |
- (ix) Short-day plants (SDPs) show flowering when critical length is less than _____.
- | | |
|--------------|---------------|
| A. 8.5 hours | B. 10 hours |
| C. 11 hours | D. 15.5 hours |



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' on the separately provided answer book. Use supplementary answer sheet i.e. Sheet-B if required. Write your answers neatly and legibly.

SECTION – B (Marks 42)

Q. 2 Attempt any FOURTEEN parts. The answer to each part should not exceed 3 to 4 lines. (14 x 3 = 42)

- | | | |
|---------|--|--------|
| (i) | How do cartilaginous fish maintain their lower internal salt concentration in marine environment? | 03 |
| (ii) | How do plants get support from various types of tissues? | 03 |
| (iii) | Draw a labelled diagram of metanephridium. | 03 |
| (iv) | a. Name the process through which Arthropodes reform their Exoskeleton. Also write different stages of this process. | 2.5 |
| | b. Name the hormone involved in this process. | 0.5 |
| (v) | Write down the commercial applications of Auxin. | 03 |
| (vi) | What are Receptors? List any four types of Receptors. | 1+2=03 |
| (vii) | Define Instinctive behaviour. Explain briefly with an appropriate example. | 03 |
| (viii) | a. How does Discoidal cleavage differ from Cleavage? | 1.5 |
| | b. How is Primitive streak formed in chick embryo? | 1.5 |
| (ix) | a. What do you mean by Nucleosome? | 01 |
| | b. How is Heterochromatin different from Euchromatin? | 02 |
| (x) | Differentiate between Alkaptonuria and Phenylketonuria. Also write their causes and symptoms. | 03 |
| (xi) | a. How does centriole take part in the formation of mitotic apparatus? | 02 |
| | b. Write the chemical composition of microtubules. | 01 |
| (xii) | Define Probability. Derive 9:3:3:1 F_2 ratio of independent assortment through product rule. | 03 |
| (xiii) | a. Define Nullo gamete. How is it formed? | 02 |
| | b. What does SRY stand for? Write down its function. | 01 |
| (xiv) | Write a brief note on Bombay Phenotype. | 03 |
| (xv) | Write down three uses of Transgenic bacteria. | 03 |
| (xvi) | Define Recombinant DNA technology. What are the basic requirements to form recombinant DNA? | 1+2=03 |
| (xvii) | Differentiate between: | |
| | a. Food chain and Food web | 1+1 |
| | b. Predator and Prey | |
| | c. Mutualism and Commensalism | 01 |
| (xviii) | What are the main observation of Darwin's theory? | 03 |
| (xix) | a. List the different zones of lake ecosystem. | 1.5 |
| | b. Write down the effects of the depletion of ozone layer. | 1.5 |

SECTION – C (Marks 26)

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

- | | | |
|------|---|----------|
| Q. 3 | a. Describe the structure of skeletal muscle. Also explain the process of contraction. | 04+03+02 |
| | b. Explain the repair process of simple fracture. | 04 |
| Q. 4 | a. Explain the process of Translation. Also draw diagrams. | 06+03 |
| | b. Define Mutation. Discuss its various types briefly. | 01+03 |
| Q. 5 | a. Define Succession. What are the two types of succession? Discuss succession on dry land. | 01+02+05 |
| | b. Explain the main steps of nitrogen cycle. | 05 |