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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) Rectal glands are present in _____

- | | |
|--------------|-----------------------|
| A. Bony fish | B. Cartilaginous fish |
| C. Hag fish | D. Fresh water fish |

(ii) _____ are mature bone cells.

- | | |
|---------------|---------------|
| A. Stem cell | B. Osteoblast |
| C. Osteoclast | D. Osteocyte |

(iii) Addison's disease is because of _____

- | | |
|------------------------------------|-------------------------------------|
| A. Hypo-function of Adrenal Cortex | B. Hyper-function of Adrenal Cortex |
| C. Hypo-function of Adrenaline | D. Hyper-function of Adrenaline |

(iv) Diploid parthenogenesis occurs in _____

- | | |
|-----------|--------------|
| A. Aphids | B. Honey Bee |
| C. Wasps | D. Ants |

(v) _____ is the study of aging

- | | |
|-----------------|----------------|
| A. Anthropology | B. Ornithology |
| C. Gerontology | D. Demography |

(vi) Okazaki fragments are about _____ long in prokaryotes.

- | | |
|--------------------------|--------------------------|
| A. 100-200 nucleotides | B. 100-300 nucleotides |
| C. 1000-2000 nucleotides | D. 1000-3000 nucleotides |

(vii) Chromosome number is doubled during _____

- | | |
|----------------|----------------|
| A. G_0 Phase | B. G_1 Phase |
| C. S-Phase | D. G_2 Phase |

(viii) How many gene pairs contribute to the wheat grain colour?

- | | |
|----------|---------|
| A. One | B. Two |
| C. Three | D. Four |

(ix) pSc 101 has antibiotic resistance gene for _____

- | | |
|-----------------|---------------|
| A. Tetracycline | B. Ampicillin |
| C. Both A and B | D. Insulin |

- (x) Which of the following is incorrectly matched?
- A. Protoplast – Plant cell engineering B. RFLPS – DNA finger printing
C. DNA polymerase – PCR D. DNA ligase – Mapping human chromosomes
- (xi) In Ecuador, forest coverage has been reduced by_____.
- A. 95% B. 85%
C. 45% D. 65%
- (xii) Rabbit is an example of _____ trophic level.
- A. T1 B. T2
C. T3 D. T4
- (xiii) Average rainfall in temperate deciduous forests is_____.
- A. 750 – 1500 mm B. 600 – 1200 mm
C. 800 – 1000 mm D. 750 – 900 mm
- (xiv) Which of the following continents has the highest rate of human population?
- A. Australia B. Africa
C. Asia D. North America
- (xv) A thickness of actin molecule is_____.
- A. 16 nm B. 7 – 8 nm
C. 2 nm D. 6 – 7 nm
- (xvi) The embryo of chick is termed as neurula at _____.
- A. 24 hours B. 18 hours
C. 21 hours D. 28 hours
- (xvii) _____ of brain controls water balance.
- A. Thalamus B. Amygdala
C. Medulla D. Hypothalamus

For Examiner's use only:

Total Marks:

17

Marks Obtained:



BIOLOGY HSSC-II

26

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

- (i) What is Pyrexia?
- (ii) Describe different types of regulations of heat exchange between animals and environment.
- (iii) Write any three major functions of the skeletal system.
- (iv) Differentiate between Active and Passive flight.
- (v) Draw a labelled diagram to show communication across synapse.
- (vi) What do you know about Habituation?
- (vii) How are Identical twins different from Fraternal twins?
- (viii) Write briefly about any two sexually transmitted diseases.
- (ix) What is the effect of light on growth of plants?
- (x) What is the concept of Differentiation?
- (xi) What are two important features of DNA polymerase III?
- (xii) Describe three types of RNA.
- (xiii) What is the difference between metaphase of mitosis and metaphase – I of meiosis – I?
- (xiv) What is Test Cross?
- (xv) How is gene therapy helpful to cure SCID?
- (xvi) Describe two main points of Darwin's Theory.
- (xvii) Differentiate between Autecology's and Synecology.
- (xviii) What are the major adaptations of Terrestrial ecosystem?
- (xix) Write one cause for each of following diseases:
 - a. Kwashiorkor
 - b. Alzheimer
 - c. Hemophilia

SECTION – C (Marks 26)

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

- Q. 3**
- a. Explain Patterns of sex determination in different animals. (09)
 - b. Describe the phenomenon of Pleiotropy. (04)
- Q. 4**
- a. How did Meselson and Stahl show that DNA replication is semi-conservative? (09)
 - b. Describe how RNA polymerase carry out the process of transcription. (04)
- Q. 5**
- a. Describe sliding filament model? What does it explain? (05)
 - b. Describe the role of hormones during excretion. (04)
 - c. Describe the functions of different parts of human forebrain. (04)



Roll No. | | | | | |

Sig. of Candidate. _____

Answer Sheet No. _____

Sig. of Invigilator. _____

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BIOLOGY HSSC-II

SECTION – A (Marks 17)

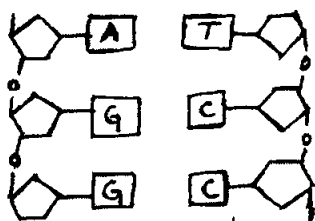
Time allowed: 25 Minutes

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) All spinal nerves are _____
A. Sensory B. Motor
C. Mixed D. Cranial
- (ii) Secretors have dominant gene 'Se' on chromosome number _____
A. 9 B. 19
C. 7 D. 12
- (iii) 'XO' in *Drosophila* is a _____
A. Sterile female B. Sterile male
C. Fertile female D. None of these
- (iv) The closing of tulip flowers at night is a _____
A. Sleep movement B. Thigmotropism
C. Themonasty D. Photonasty
- (v) Plants respond to cold stress by increasing proportion of _____
A. Unsaturated Fatty Acids B. Saturated Fatty Acids
C. Amino Acids D. Nucleic Acids
- (vi) In most ecosystems, the greatest amount of energy flows through the _____
A. Secondary consumers B. Parasites
C. Herbivores D. Carnivores
- (vii) Which of the following lists has three homologous structures?
A. Bird leg, Dolphin flipper, Fish pectoral fin B. Whale flipper, Bat wing, Lizard front leg
C. Locust wing, Bat wing, Bird wing D. Fish pectoral fin, Lizard front leg, Locust wing
- (viii) A girl has blood group 'A' and her brother has 'B' Which combination of genotypes can **NOT** belong to their parents?
A. Mother $I^A I^A$ Father $I^B I^O$ B. Mother $I^A I^B$ Father $I^A I^B$
C. Mother $I^O I^O$ Father $I^A I^B$ D. Mother $I^B I^O$ Father $I^A I^O$
- (ix) How many different genotypes can be found in the offspring of the cross $BbCc \times BbCc$?
A. 2 B. 4
C. 9 D. 16
- (x) Which of the following describes the process of natural selection?
A. Change from simple to complex organisms
B. Differential reproductive success between genotypes
C. Increase in the size of population
D. Occurrence of new mutation

- (xi) Which of the following is a sign of insulin deficiency?
- A. Low blood sugar level
 B. Increased ability of the tissue to oxidize glucose
 C. An increased amount of glycogen stored in the liver
 D. Excretion of sugar in urine
- (xii) In the genetic engineering of bacteria to produce insulin, what is the vector?
- A. A bacterium
 B. A gene
 C. An enzyme
 D. A plasmid
- (xiii) The following diagram shows part of DNA molecule:



How many hydrogen bonds are involved in holding these strands of DNA together?

- A. 10
 B. 8
 C. 6
 D. 3
- (xiv) During which stage of mitotic cell cycle is DNA replicated?
- A. Prophase
 B. Telophase
 C. Metaphase
 D. Interphase
- (xv) Batteries store _____ energy.
- A. Electrical
 B. Mechanical
 C. Chemical
 D. Nuclear
- (xvi) Which biome has the richest soil with nutrients and can be converted into agriculture?
- A. Deciduous forest
 B. Tropical rain forest
 C. Grassland
 D. Coniferous forest
- (xvii) In a population with two alleles for a particular locus, "B" and 'b', the allele frequency of B is 0.7. What would be the frequency of heterozygote if the population is in Hardy-Weinberg equilibrium?
- A. 0.7
 B. 0.42
 C. 0.49
 D. 0.21

For Examiner's use only:

Total Marks:

17

Marks Obtained:



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

- (i) How are plants adapted to low temperature?
- (ii) How does osmoregulation take place in marine animals?
- (iii) What is Hydroskeleton? Describe its function.
- (iv) How does locomotion take place in earthworm?
- (v) Define Parthenogenesis and its various types.
- (vi) Define Apical dominance. What is its significance?
- (vii) Give an account of Embryonic induction.
- (viii) What is Regeneration? Why is it so effective in some animals while missing in others?
- (ix) Give an account of Phenylketonuria.
- (x) How can you identify cancer cells?
- (xi) Explain how type 'A' and 'AB' parents can produce a child of blood type 'O'.
- (xii) Differentiate between the following:
 - a. Incomplete dominance and Co-dominance.
 - b. Sex-limited and Sex influenced traits.
- (xiii) What is Genomic library? How can we make a genomic library?
- (xiv) What are the Endangered species? What measures could be adopted for their preservation?
- (xv) Describe food web and give its significance. Also give one example.
- (xvi) Describe Eutrophication.
- (xvii) Write a short note on Ecological niche.
- (xviii) What is Mongolism? How is it caused?
- (xix) What do you mean by non-renewable resources?

SECTION – C (Marks 26)

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

(2 x 13 = 26)

- Q. 3**
- a. Give an account of Grassland ecosystem. (07)
 - b. Draw Nitrogen cycle. (04)
 - c. What do you know about Grazing? (02)
- Q. 4**
- a. Explain Beadle and Tatum experiment. (06)
 - b. What is the genetics of colour blindness? (04)
 - c. What is Bombay Phenotype? (03)
- Q. 5**
- a. Explain female reproductive cycle in humans. (09)
 - b. Describe the role of hormones during birth process (in humans). (04)