



BIOLOGY HSSC-II

SECTION – A (Marks 17)

30

Time allowed: 25 Minutes

Punjab Text Book Board

Version Number 8 1 0 4

Note: Section – A is compulsory. All parts of this section are to be answered on the separately provided OMR Answer Sheet which 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 Choose the correct answer A / B / C / D by filling the relevant bubble for each question on the OMR Answer Sheet according to the instructions given there. Each part carries one mark.

- 1) If a heterozygous yellow seeded plant is crossed with a homozygous green seeded plant, what is the probability of progeny having green seeds?
A. 25% B. 50% C. 100% D. Zero
- 2) A gardener wants to regulate fruit drop from apple crop to reduce the time for picking them, he will be spraying:
A. Auxins B. Abscissic acid C. Gibberellins D. Ethane
- 3) If the recombination frequency between A & B is 11%, A & C is 19%, B & C is 30% what would be the arrangement of genes?
A. ACB B. BCA C. BAC D. ABC
- 4) In urea cycle citrulline combines with a precursor molecule called:
A. Arginine B. Ornithine
C. Arginase D. Arginosuccinate
- 5) The joint that fixes teeth in your jaw is:
A. Fibrous B. Synovial C. Pivot D. Cartilaginous
- 6) Select the **mismatched** one in the following:
A. Pectoral girdle – Clavicle B. Metatarsals – Palm of hand
C. Cervical vertebrae – Neck D. Pelvic girdle – Ilium
- 7) In human female secondary oocyte is released from the ovary at the stage of:
A. Metaphase – I B. Anaphase – II C. Metaphase – II D. Anaphase – I
- 8) Increase in the intensity of light increases the number of cell:
A. Elongation B. Division C. Maturation D. Differentiation
- 9) Which of the following syndrome is **NOT** related to the abnormality of sex-chromosomes?
A. Down's B. Klinefelter's C. Turner's D. Jacob's
- 10) Select a start codon for the synthesis of a polypeptide chain:
A. AGA B. AUG C. AAU D. AAG
- 11) During final moments of a football match your heart beat accelerates due to the secretion of:
A. Adrenaline B. Cortisol C. Parathormone D. Thyroxin
- 12) Considering R for red and r for white eye colour, if a heterozygous female *Drosophila* is crossed with a white eye male, what would be the percentage of white eye colour in male flies in the next generation?
A. 25% B. 100% C. 50% D. Zero
- 13) Taq polymerase is the other name of:
A. Primase B. DNA ligase
C. DNA Polymerase D. RNA polymerase
- 14) Variation in gene frequency just by a chance is called:
A. Non random mating B. Genetic drift
C. Probability D. Random mating
- 15) In the following there is **NO** difference between:
A. Primary consumers & herbivores B. Primary carnivores & trophic level-II
C. Secondary consumer & omnivores D. Trophic level I & herbivores
- 16) A tree-less region is called:
A. Alpine B. Tundra C. Taiga D. Boreal
- 17) All are the consequences of deforestation **EXCEPT**:
A. Silting of lakes B. Interception of heavy rainfall
C. Heavy floods D. Soil erosion



BIOLOGY HSSC-II

Punjab Text Book Board

Time allowed: 2:35 Hours

Total Marks Sections B, C and D: 68

NOTE: Answer any Seven parts each from Section 'B' and 'C' and any two questions from Section 'D' 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 21)

(Chapter 15 – 20)

Q. 2 Answer any SEVEN parts. The answer to each part should not exceed 5 to 6 lines. (7 x 3 = 21)

- (i) Discuss the role of hormones for maintaining the concentration of urine.
- (ii) Describe briefly the characteristics of a bone.
- (iii) Name the synthetic auxins and describe their commercial applications.
- (iv) How do fresh water organisms maintain osmoregulation?
- (v) Is it true that low temperature treatment is significant for flower formation? If so discuss it briefly.
- (vi) How is a lagging strand synthesized in the replication process?
- (vii) Discuss the contribution of Macleod and McCarty in identifying transforming principle.
- (viii) Define the following terms:
a) Anticodon b) Photoperiodism c) Haptonasty
- (ix) Discuss the role of parathyroid gland.
- (x) How is a blastula formed in a developing chick embryo?

SECTION – C (Marks 21)

(Chapter 21 – 27)

Q. 3 Answer any SEVEN parts. The answer to each part should not exceed 5 to 6 lines. (7 x 3 = 21)

- (i) Define metastasis. What are the properties of cancer cells?
- (ii) What is the test cross? Discuss its significance by making a cross.
- (iii) Discuss Ex-vivo gene therapy to replace faulty genes in the body.
- (iv) How is a recombinant DNA formed?
- (v) Discuss how a eukaryotic cell evolved from prokaryotic cell according to endosymbiont hypothesis.
- (vi) What is meant by "Mycorrhizal association"?
- (vii) What type of organisms are present in limnetic and profundal zone of a lake ecosystem.
- (viii) Briefly describe the causes of ozone depletion. What are its consequences?
- (ix) Differentiate between:
a) G_1 & G_2 Phase
b) Locus & Allele
c) Autecology & Synecology
- (x) Write an account of Type-I diabetes mellitus.

SECTION – D (Marks 26)

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

- Q. 4**
- a. Explain sliding filament model of muscle contraction. Also describe the formation and control of cross bridges with the help of diagram. (4+3+1)
 - b. Define epistasis. Explain this with reference to Bombay Phenotype. (2+3)
- Q. 5**
- a. Define nerve impulse. What are the major factors maintaining RMP on a nerve fibre? Also draw diagram. (2+5+1)
 - b. Write an account of Genomic Library. (05)
- Q. 6**
- a. Explain nitrogen cycle in detail with diagram. (5+2)
 - b. What is meant by apical dominance? How is this phenomena related to growth of a plant? (2+4)

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BIOLOGY HSSC-II

SECTION – A (Marks 17)

32

Time allowed: 25 Minutes

National Book Foundation

Version Number 4 1 0 3

Note: Section – A is compulsory. All parts of this section are to be answered on the separately provided OMR Answer Sheet which 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 Choose the correct answer A / B / C / D by filling the relevant bubble for each question on the OMR Answer Sheet according to the instructions given there. Each part carries one mark.

- 1) Which of the following is the function of thermocycler?
 - A. It controls the pH of PCR mixture
 - B. It inhibits contamination in PCR mixture
 - C. It regulates the temperature of PCR mixture
 - D. It maintains the composition of PCR mixture
- 2) Which of the following is the precipitate produced by sewage treatment?
 - A. Algal blooms
 - B. Pond scum
 - C. Sludge
 - D. Humus
- 3) Which of the following combination of events is related to the inspiration phase of breathing?

	Diaphragm	External intercostal muscles	Internal intercostal muscles
A.	Relaxation	Relaxation	Contraction
B.	Relaxation	Contraction	Contraction
C.	Contraction	Contraction	Relaxation
D.	Contraction	Relaxation	Contraction

- 4) The type of urinary tract infection in which kidneys are particularly infected is called:
 - A. Encephalitis
 - B. Pyelonephritis
 - C. Urethritis
 - D. Cystitis
- 5) Which of the following pairs of ribs are called floating ribs?
 - A. 8th, 9th and 10th
 - B. 11th and 12th
 - C. 6th, 7th and 8th
 - D. 7th, 8th and 9th
- 6) Which of the following terms can be used for axon fibre of a neuron?
 - A. Pre synaptic fibre or pre ganglionic fibre
 - B. Post ganglionic fibre or post synaptic fibre
 - C. Pre ganglionic or post synaptic fibre
 - D. Pre synaptic fibre or post ganglionic fibre
- 7) Which of the following components of nervous system are **NOT** involved in reflex arc?
 - A. Central nervous system
 - B. Brain
 - C. Receptors and effectors
 - D. Neurons other than sensory and motor neurons

- 8) Infundibulum is the stalk, composed of blood vessels and the fibres of neurosecretory cells, by which:
- Adrenal glands are attached to the kidney
 - Brain sends signals to the spinal cord
 - Two cerebral hemispheres are attached together
 - Pituitary gland is attached to hypothalamus
- 9) Insulin promotes all of the following events **EXCEPT**:
- Use of glucose in cellular respiration
 - Conversion of excess glucose to fats
 - Glycogenesis
 - Gluconeogenesis
- 10) When an animal learns the same response for two different stimuli which are given to the animal simultaneously, it is called?
- Latent learning
 - Habituation
 - Classical conditioning
 - Insight learning
- 11) After ovulation, the ruptured follicle is transformed into a glandular structure called:
- Blastocyst
 - Inner cell mass
 - Graffian follicle
 - Corpus luteum
- 12) During embryonic development, all of the following parts have been developed from neural crest cell **EXCEPT**:
- Skull bones
 - Brain and spinal cord
 - Peripheral nerves
 - Medulla of the adrenal gland
- 13) Mr. James has A+ve blood group while his wife has A-ve, they have one child, who has O-ve blood group. What is probability of O+ve daughter in next pregnancy?
- $\frac{1}{8}$
 - $\frac{1}{16}$
 - Zero
 - $\frac{1}{4}$
- 14) In Morgon's experiment, what was the F_2 ratio of cross between F_1 male and female flies having long wing, broad abdomen phenotypes?
- 9:3:3:1
 - 1:1:1:1
 - 1:1
 - 3:1
- 15) Which of the following is correct about the nucleotide sequence TATAAT?
- It is -35 sequence located in coding strand
 - It is -35 sequence located in template strand
 - It is -10 sequence located in coding strand
 - It is -10 sequence located in template strand
- 16) Which of the following is represented by "1" in the given equation ($p^2 + 2pq + q^2 = 1$)?
- Sum of all genotype frequencies
 - Sum of all gene frequencies
 - Genotype frequency of recessive homozygotes
 - Genotype frequency of dominant homozygotes
- 17) In the absence of oxygen in soil, which of the following bacteria breakdown nitrates releasing nitrogen back into the atmosphere using the oxygen for their own respiration?
- Rhizobium*
 - Pseudomonas*
 - Azotobacter*
 - Clostridium*



BIOLOGY HSSC-II

(National Book Foundation)

Time allowed: 2:35 Hours

Total Marks Sections B, C and D: 68

NOTE: Answer any Seven parts each from Section 'B' and 'C' and any two questions from Section 'D' 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 21) (Chapter 14 – 20)

- Q. 2** Answer any **SEVEN** parts. The answer to each part should not exceed 5 to 6 lines. (7 x 3 = 21)
- (i) a. How do haemoglobin molecules lose oxygen when they reach at tissue bed? (1)
b. Write any two differences between haemoglobin and myoglobin? (2)
 - (ii) What is sinusitis? Give its cause and symptoms? (3)
 - (iii) Human nephrons have association of three types of capillary beds. Give their names and location in the kidney. (3)
 - (iv) How and when is concentrated urine formed in human kidneys? (3)
 - (v) Write any three differences between bones and cartilages. (3)
 - (vi) a. What is the difference between true and false ribs. (1)
b. What is sprain? How can it be treated? (2)
 - (vii) What is headache or cephalalgia? Differentiate between primary and secondary headache. (3)
 - (viii) What are the effects of abnormal secretions of antidiuretic hormone? (3)
 - (ix) Explain briefly the hostile and helpful intraspecific interaction by giving suitable example. (3)
 - (x) What do you know about the location and function of sertoli cells and leydig cells in male reproductive system. (3)

SECTION – C (Marks 21) (Chapter 21 – 27)

- Q. 3** Answer any **SEVEN** parts. The answer to each part should not exceed 5 to 6 lines. (7 x 3 = 21)
- (i) Explain briefly the formation of neural crest and its role in development. (3)
 - (ii) a. Workout all possible types of gametes from the individual having genotype "AaBbCc". (1)
b. What do you know about the dominance relations among multiple alleles of ABO blood group system? (2)
 - (iii) Explain the mechanism of sex determination in *Drosophila*. (3)
 - (iv) "Genetic code is universal but not quite universal" Justify this statement. (3)
 - (v) a. Write the difference between karyotype of patients of Down syndrome and of Klinefelter's syndrome. (1)
b. Give any two differences between positive and negative regulation of gene expression. (2)
 - (vi) Why was the theory of evolution proposed by Lamarck rejected? (3)
 - (vii) What is productivity of an ecosystem? Differentiate the concept of gross primary productivity and net primary productivity. (3)
 - (viii) What are restriction endonucleases? Explain their mode of action by giving a suitable example. (3)
 - (ix) Explain briefly the two major techniques of animal cell culture. (3)
 - (x) What is integrated disease management? How can it be administered? (3)

SECTION – D (Marks 26)

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

- Q. 4** a. Describe the mechanism of contraction of skeletal muscles. Draw labelled diagram. (3 + 2)
b. Describe female reproductive cycle and its hormonal regulation. Also draw labelled diagrams showing the changes in ovaries and uterus during the cycle. (5 + 3)
- Q. 5** a. Describe range of phenotype and their genetic basis in ABO blood group system. Also discuss the compatibility of different blood type of this system for transfusions. (2 + 2 + 4)
b. Describe Griffith's experiment and its conclusion. Also draw its diagram. (3 + 2)
- Q. 6** a. Describe different steps of nitrogen cycle and draw its concept map. (6 + 2)
b. Describe the procedure of Sanger – Coulson Method of DNA Sequencing. Also draw its diagram. (3 + 2)



BIOLOGY HSSC-II
SECTION – A (Marks 17)

Time allowed: 25 Minutes National Book Foundation Version Number 4 1 0 6

Note: Section – A is compulsory. All parts of this section are to be answered on the separately provided OMR Answer Sheet which 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 Choose the correct answer A / B / C / D by filling the relevant bubble for each question on the OMR Answer Sheet according to the instructions given there. Each part carries one mark.

1) The process of introducing new plants from their growing place to new locality with different climate is termed as:

- A. Plant introduction
- B. Selection
- C. Hybridization
- D. Acclimatization

2) Which of the following combination of events is related to the expiration phase of breathing?

	Diaphragm	External intercostal muscles	Internal intercostal muscles
A.	Relaxation	Contraction	Contraction
B.	Contraction	Contraction	Relaxation
C.	Contraction	Relaxation	Contraction
D.	Relaxation	Relaxation	Contraction

3) The animals which are hypotonic to their outer environment are:

- A. Only terrestrial animals
- B. Freshwater fishes and marine bony fishes
- C. Freshwater fishes and terrestrial animals
- D. Marine bony fishes and terrestrial animals

4) Which of the following type of joints is found between the shaft regions of the long bones in the forearm and in the leg?

- A. Synovial joint
- B. Fibrous joint
- C. Cartilaginous joint
- D. Hinge joint

5) After an action potential, nerve fibre undergoes a period of recovery in which it regains its original ionic distribution and polarity and prepares itself for the next stimulation. This period of recovery of nerve fibre is called:

- A. Active period
- B. Refractory period
- C. Recovery period
- D. Resting period

6) All of the following are excitatory neurotransmitters **EXCEPT**:

- A. Acetylcholine
- B. Serotonin
- C. Dopamine
- D. Endorphins

7) Which of the following hormones acts as first messenger that binds with its receptor on the plasma membrane of target cell, starting a series of events in the cell which generates second messenger?

- A. Oxytocin
- B. Cortisone
- C. Aldosterone
- D. Testosterone

8) A type of learning behaviour in which an animal temporarily learns to ignore a repeated, irrelevant stimulus, is called:

- A. Habituation
- B. Classical conditioning
- C. Insight learning
- D. Latent learning

- 9) Based upon changes and hormonal regulation the female reproductive cycle can be divided into three phases i.e., menstrual phase, proliferative phase and:
- A. Post menstrual phase B. Follicular phase
C. Secretory phase D. Pre-ovulatory phase
- 10) The blastocyst is a fluid-filled hollow sphere composed of single layer of large, flattened cells called _____ and a small cluster of 20 to 30 rounded cells inside it.
- A. Amniotic cells B. Inner cell mass
C. Ectodermal cells D. Trophoblast cells
- 11) Mr. John has B+ve blood group while his wife has B-ve, they have one child, who has O-ve blood group. What is the probability of daughter with O+ve blood group in next pregnancy?
- A. $\frac{1}{16}$ B. Zero C. $\frac{1}{4}$ D. $\frac{1}{8}$
- 12) If a light red wheat grain plant having genotype (AaBbCc) is self-fertilized, what will be the expected ratio of dark red wheat grain plants (AABBCC) to white grain wheat plants (aabbcc)?
- A. 1:6:15:20:15:6:1 B. 1:1
C. 3:1 D. 9:3:3:1
- 13) In DNA replication process, the replacement of primers by DNA nucleotides is carried out by:
- A. Primase B. DNA helicase
C. DNA polymerase-I D. DNA ligase
- 14) Which of the following causes the RNA polymerase to stop the synthesis of RNA?
- A. 3'-Tail B. Any of the three stop codons
C. GC hairpin D. 5'-Cap
- 15) Which of the following is represented by "1" in the given equations ($p = 1 - q$), ($q = 1 - p$)?
- A. Sum of all gene frequencies
B. Genotype frequency of recessive homozygotes
C. Genotype frequency of dominant homozygotes
D. Sum of all genotype frequencies
- 16) Which of the following are important members of crustose lichen stage in ecological succession on rock surface?
- A. *Permelia* and *Dermatocarpom* B. *Azotobacter* and *Clostridium*
C. *Licanora* and *Rhinodina* D. *Rhizobium* and *Dermatocarpom*
- 17) In DNA test, after hybridization, excess probes are washed from the membrane and the pattern of hybridization is visualized on X-ray film by exposing the membrane to an X-ray source. This technique is known as:
- A. RFLP analysis B. Gel electrophoresis
C. Autoradiography D. X-ray diffraction analysis



BIOLOGY HSSC-II

(National Book Foundation)

Time allowed: 2:35 Hours

Total Marks Sections B, C and D: 68

NOTE: Answer any Seven parts each from Section 'B' and 'C' and any two questions from Section 'D' 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 21)

(Chapter 14 – 20)

- Q. 2** Answer any SEVEN parts. The answer to each part should not exceed 5 to 6 lines. (7 x 3 = 21)
- (i) Enlist the changes that occur in diaphragm and ribcage while inspiration and expiration. (3)
 - (ii) Why breathing through nose is supposed to be more advantageous? (3)
 - (iii) How do marine osmoconformers become isotonic to their outer environment? (3)
 - (iv) a. Differentiate the terms nephrolithiasis and pyelonephritis. (1)
b. Define urethritis and cystitis. Why are these conditions fifty times more common in women than in men? (2)
 - (v) Name the muscles involved in the movement of tibio-femoral joint. Also give origin and insertion of these muscles. (3)
 - (vi) Define three most common types of bone fractures? (3)
 - (vii) Highlight any three features of neuron that influence the velocity of nerve impulse? (3)
 - (viii) Explain briefly the mode of action of protein and peptide hormones. (3)
 - (ix) The response to a stimulus can be positive, negative, or ignored. Demonstrate them by giving one suitable example of each? (3)
 - (x) a. Differentiate the terms azoospermia and oligospermia. (1)
b. How does ovulation occur in female reproductive cycle? (2)

SECTION – C (Marks 21)

(Chapter 21 – 27)

- Q. 3** Answer any SEVEN parts. The answer to each part should not exceed 5 to 6 lines. (7 x 3 = 21)
- (i) a. Define meroblastic cleavage. Also give its example. (1)
b. Explain briefly the structure of human blastocyst. (2)
 - (ii) A pink flower four o'clock plant is crossed with a red flower plant. Find: (3)
 - a. Probability of Red flower plant
 - b. Probability of Pink flower plant
 - c. Ratio of pink flower to red flower plant.
 - (iii) How can we determine if the two genes are linked or not? (3)
 - (iv) Enlist the types of chromosomes based upon position of centromere and define each of them. (3)
 - (v) a. What is the role of DNA polymerase-I in DNA replication process? (1)
b. How do promoter regions of prokaryotic and eukaryotic genes differ from each other? (2)
 - (vi) Explain the concept of genetic drift with the help of suitable example. (3)
 - (vii) What is nitrogen fixation and give its types? (3)
 - (viii) Analyse the gel pattern (in Fig. Q3 (viii)) carefully and: (3):
 - a. Suggest method of gene sequencing which is used while obtaining this gel.
 - b. Read the sequence of nucleotides from the gel and highlight its 5' and 3' ends.
 - c. Propose the actual target sequence which is used to obtain this gel pattern
 - (ix) What are the methods to obtain gene of interest in recombinant DNA technology? (3)
 - (x) Suggest what types of vaccines are available for prevention of the polio infection? (3)

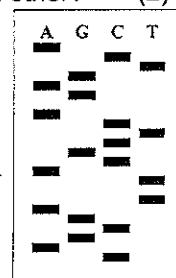


Fig. Q3 (viii)

SECTION – D (Marks 26)

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

- Q. 4** a. Explain the structure of synapse. Draw its labelled diagram. Also discuss the mechanism of synaptic transmission. (1 + 2 + 3)
- b. Describe neurulation in human embryo. Also draw its labelled diagram (2 + 2)
- c. Explain and diagrammatically represent the mechanism of haemodialysis. (1.5 + 1.5)
- Q. 5** a. Describe the inheritance of Coat colour in the *Labrador retriever* and highlight the phenomenon of epistasis in this trait. (6 + 2)
- b. Write a comparative note on different models of DNA replication. Draw the diagrams of models (3 + 2)
- Q. 6** a. Define Hardy-Weinberg principle and describe the factors that can change the gene and genotype frequencies of a natural population. (1 + 4)
- b. Describe the mechanism/procedure of DNA analysis/testing Represent its procedural steps diagrammatically. (6 + 2)

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BIOLOGY HSSC-II

SECTION – A (Marks 17)

36

Time allowed: 25 Minutes

National Book Foundation

Version Number 8 1 0 5

Note: Section – A is compulsory. All parts of this section are to be answered on the separately provided OMR Answer Sheet which 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 Choose the correct answer A / B / C / D by filling the relevant bubble for each question on the OMR Answer Sheet according to the instructions given there. Each part carries one mark.

- 1) Vasa recta are thin walled capillaries emerging from the:
A. Afferent arterioles
B. Efferent arterioles
C. Glomerulus
D. Renal vein
- 2) Which of the following is the bone of human fore limbs?
A. Femur
B. Radius
C. Metatarsal
D. Fibula
- 3) The hormone that forces the corpus luteum in the ovary to continue to secrete progesterone is called:
A. FSH
B. Human chorionic gonadotropin
C. Estrogen
D. Prolactin
- 4) Low ADH in Blood is connected with:
A. Dilution of urine
B. Concentration of urine
C. Slow heartbeat
D. Rapid heartbeat
- 5) Fallopian tube is a part of:
A. Uterus
B. Ovary
C. Oviduct
D. Vas deference
- 6) If a haemophilic man marries a normal but carrier woman what is the probability of their child/children to be a haemophilic.
A. 100%
B. 75%
C. 50%
D. 0%
- 7) The possible blood group of children born to parents having A and AB blood group are:
A. O, A and AB
B. O, A and B
C. O and A
D. A and AB
- 8) In mitochondria UGA reads as:
A. Stop codon
B. Tryptophan
C. Arginine
D. Glycine
- 9) The wall of alveolus is only _____ thick.
A. 0.1nm
B. 0.1μm
C. 1nm
D. 1μm
- 10) _____ noted that human population has the capacity to increase exponentially and food supply has a capacity to increase arithmetically.
A. Alfred Wallace
B. Thomas R. Malthus
C. Charles Layell
D. Darwin

- _____



BIOLOGY HSSC-II

(National Book Foundation)

37

Time allowed: 2:35 Hours

Total Marks Sections B, C and D: 68

NOTE: Answer any Seven parts each from Section 'B' and 'C' and any two questions from Section 'D' 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 21) (Chapter 14 – 20)

- Q. 2** Answer any **SEVEN** parts. The answer to each part should not exceed 5 to 6 lines. (7 x 3 = 21)
- (i) What is hamburger phenomenon?
 - (ii) Write the function of:
 - a. Ionocytes b. Rectal glands c. Osmolytes
 - (iii) Write at least one cause of the following:
 - a. Muscle Fatigue b. Cramps c. Tetany
 - (iv) Write the names of facial bones and their numbers in human.
 - (v) Briefly write about internal structure of Spinal Cord.
 - (vi) Write about any one mode of Hormonal actions.
 - (vii) How are Cretinism and myxoedema different?
 - (viii) How is Habituation different from Imprinting?
 - (ix) How is Human reproductive system Unique?
 - (x) Write about any three causes of female infertility.

SECTION – C (Marks 21) (Chapter 21 – 27)

- Q. 3** Answer any **SEVEN** parts. The answer to each part should not exceed 5 to 6 lines. (7 x 3 = 21)
- (i) Why are neural Crest Cells called fourth germinal layer?
 - (ii) What are the limitations of Mendelian law of independent Assortment?
 - (iii) Write about the transfusion Principal of Rh blood group.
 - (iv) Write any three characteristics of Genetic Code.
 - (v) How is regulation of gene Expression Important?
 - (vi) What is Sympatric Speciation?
 - (vii) What are the causes of Ozone layer depletion?
 - (viii) Write the steps involved in the DNA sequencing techniques.
 - (ix) Write about the two major techniques of Animal cell culture.
 - (x) What is Acclimatization?

SECTION – D (Marks 26)

- Note:** Attempt any **TWO** questions. All questions carry equal marks. (2 x 13 = 26)
- Q. 4**
- a. Explain ultra-structure of skeletal muscle with the help of diagram. (4+2)
 - b. Write about Repolarization and Hyperpolarization of Neuron fibre. (3.5+3.5)
- Q. 5**
- a. Explain the Mechanism of translation with the help of diagram. (8+2)
 - b. What are the kinds of successions? (3)
- Q. 6**
- a. Write the mechanism of PCR reaction with the help of diagram. (7+2)
 - b. Describe the Blood circulation to human Nephron. (4)

THE FUTURE OF AI

1	Introduction	1
2	The Current State of AI	2
3	The Future of AI	3
4	The Impact of AI on Society	4
5	The Role of AI in the Workplace	5
6	The Ethics of AI	6
7	The Future of AI in Healthcare	7
8	The Future of AI in Education	8
9	The Future of AI in Transportation	9
10	The Future of AI in Finance	10
11	The Future of AI in Manufacturing	11
12	The Future of AI in Agriculture	12
13	The Future of AI in Energy	13
14	The Future of AI in Space Exploration	14
15	The Future of AI in Cybersecurity	15
16	The Future of AI in Law	16
17	The Future of AI in Politics	17
18	The Future of AI in Art and Creativity	18
19	The Future of AI in Sports	19
20	The Future of AI in Entertainment	20
21	The Future of AI in Marketing	21
22	The Future of AI in Customer Service	22
23	The Future of AI in Human Resources	23
24	The Future of AI in Project Management	24
25	The Future of AI in Data Analysis	25
26	The Future of AI in Software Development	26
27	The Future of AI in Hardware Development	27
28	The Future of AI in Cloud Computing	28
29	The Future of AI in Mobile Computing	29
30	The Future of AI in Wearable Computing	30
31	The Future of AI in Smart Home Technology	31
32	The Future of AI in Smart City Technology	32
33	The Future of AI in Smart Agriculture Technology	33
34	The Future of AI in Smart Manufacturing Technology	34
35	The Future of AI in Smart Transportation Technology	35
36	The Future of AI in Smart Finance Technology	36
37	The Future of AI in Smart Manufacturing Technology	37
38	The Future of AI in Smart Agriculture Technology	38
39	The Future of AI in Smart Energy Technology	39
40	The Future of AI in Smart Space Exploration Technology	40
41	The Future of AI in Smart Cybersecurity Technology	41
42	The Future of AI in Smart Law Technology	42
43	The Future of AI in Smart Politics Technology	43
44	The Future of AI in Smart Art and Creativity Technology	44
45	The Future of AI in Smart Sports Technology	45
46	The Future of AI in Smart Entertainment Technology	46
47	The Future of AI in Smart Marketing Technology	47
48	The Future of AI in Smart Customer Service Technology	48
49	The Future of AI in Smart Human Resources Technology	49
50	The Future of AI in Smart Project Management Technology	50
51	The Future of AI in Smart Data Analysis Technology	51
52	The Future of AI in Smart Software Development Technology	52
53	The Future of AI in Smart Hardware Development Technology	53
54	The Future of AI in Smart Cloud Computing Technology	54
55	The Future of AI in Smart Mobile Computing Technology	55
56	The Future of AI in Smart Wearable Computing Technology	56
57	The Future of AI in Smart Smart Home Technology	57
58	The Future of AI in Smart Smart City Technology	58
59	The Future of AI in Smart Smart Agriculture Technology	59
60	The Future of AI in Smart Smart Manufacturing Technology	60
61	The Future of AI in Smart Smart Transportation Technology	61
62	The Future of AI in Smart Smart Finance Technology	62
63	The Future of AI in Smart Smart Manufacturing Technology	63
64	The Future of AI in Smart Smart Agriculture Technology	64
65	The Future of AI in Smart Smart Energy Technology	65
66	The Future of AI in Smart Smart Space Exploration Technology	66
67	The Future of AI in Smart Smart Cybersecurity Technology	67
68	The Future of AI in Smart Smart Law Technology	68
69	The Future of AI in Smart Smart Politics Technology	69
70	The Future of AI in Smart Smart Art and Creativity Technology	70
71	The Future of AI in Smart Smart Sports Technology	71
72	The Future of AI in Smart Smart Entertainment Technology	72
73	The Future of AI in Smart Smart Marketing Technology	73
74	The Future of AI in Smart Smart Customer Service Technology	74
75	The Future of AI in Smart Smart Human Resources Technology	75
76	The Future of AI in Smart Smart Project Management Technology	76
77	The Future of AI in Smart Smart Data Analysis Technology	77
78	The Future of AI in Smart Smart Software Development Technology	78
79	The Future of AI in Smart Smart Hardware Development Technology	79
80	The Future of AI in Smart Smart Cloud Computing Technology	80
81	The Future of AI in Smart Smart Mobile Computing Technology	81
82	The Future of AI in Smart Smart Wearable Computing Technology	82
83	The Future of AI in Smart Smart Smart Home Technology	83
84	The Future of AI in Smart Smart Smart City Technology	84
85	The Future of AI in Smart Smart Smart Agriculture Technology	85
86	The Future of AI in Smart Smart Smart Manufacturing Technology	86
87	The Future of AI in Smart Smart Smart Transportation Technology	87
88	The Future of AI in Smart Smart Smart Finance Technology	88
89	The Future of AI in Smart Smart Smart Manufacturing Technology	89
90	The Future of AI in Smart Smart Smart Agriculture Technology	90
91	The Future of AI in Smart Smart Smart Energy Technology	91
92	The Future of AI in Smart Smart Smart Space Exploration Technology	92
93	The Future of AI in Smart Smart Smart Cybersecurity Technology	93
94	The Future of AI in Smart Smart Smart Law Technology	94
95	The Future of AI in Smart Smart Smart Politics Technology	95
96	The Future of AI in Smart Smart Smart Art and Creativity Technology	96
97	The Future of AI in Smart Smart Smart Sports Technology	97
98	The Future of AI in Smart Smart Smart Entertainment Technology	98
99	The Future of AI in Smart Smart Smart Marketing Technology	99
100	The Future of AI in Smart Smart Smart Customer Service Technology	100