HSSC-(P-II)-A/2023

Paper Code	8	4	6	1

Roll No [redacted] be filled in by the candidate

(For All Sessions)

Biology (Objective) Rwp-12-1-23 (Group-I)

Time: 20 Minutes Marks : 17

Note: Write Answers to the Questions on the objective answer sheet provided. Four possible answers A, B, C and D to each question are given. Which answer you consider correct, fill the correspon ling circle A, B, C or D given in front of each question with Marker or Pen ink on the answer sheet provided.

1.1. The only excretory structures in animal kingdom that are associated with digestive tract are called:

(A) Kidneys (B) Flame cells (C) Malpighian Tubules (D) Metnephridia

2. The number of lumbes vertebrae in human is:

(A) Five (B) Nine (C) Two (D) Seven

3. Bone forming cells are called:

(A) Osteocytes (B) Osteoclasts (C) Chondroblasts (D) Osteoblasts

4. Sensation of pain is produced by:

(A) Photoreceptors (B) Nociceptors (C) Thermo receptors (D) Chemo receptors

5. Which of the following do not help in coordination:

(A) Receptors (B) Effectors (C) Neuroglia (D) Neurons

6. Pasthenocarpy is the development of fruit without:

(A) Fertilization (B) Pollination (C) Germination (D) Hormones

7. The loss of memory and white hairs comes under:

(A) Merntology (B) Teratology (C) Regeneration (D) Gerontology

8. Which of the following is not non-sense codon:

(A) UGA (B) AUG (C) UAG (D) UAA

9. Centeal dogma is used for ____ in all organisms.

(A) Behavioral expression (B) Gene depression (C) Necrosis (D) Gene expression

10. Short stature, webbed neck and without ovaries are related to:

(A) 44 autosomes +X (B) 2n+1 (C) 44 autosomes + XXY (D) 23+XY

11. Which of the following is not hereditary disease:

(A) Diabetes mellitus (B) Hemophilia (C) Malaria (D) Color blindness

12. In tissue culture enzymes are used to digest the:

(A) Chloroplast (B) Cell wall (C) Vacuole (D) Cell membrane

13. For the entry of DNA, high voltage electric pulses are applied for making pores in:

(A) Plasma membrane (B) DNA (C) Cytoplasm (D) Cell wall

14. In certain areas, such as Ecuador forests coverage has reduced by:

(A) 100% (B) 50% (C) 30% (D) 95%

15. Which is not abiotic component:

(A) Water (B) Plant (C) Light (D) Air

16. The zone in lake where light is insufficient to support photosynthesis is called:

(A) Profundal (B) Littoral (C) Limnetic (D) Shallow

17. Stone monuments like "Taj Mahal" are being eroded due to stone cancer by:

(A) Eutrophication (B) Radiation (C) Acid rain (D) Air

Rwp-12-1-23

SECTION-I

2. **Write short answers of any eight parts from the following:** (8x2=16)

i. Name plasma proteins synthesized by liver. Also write their functions.
ii. Differentiate between peritoneal and hemodialysis.
iii. Why leaves are said to be excretophores?
iv. What are the skeletal deformities because of genetic causes?
v. Draw the labeled diagram of a sarcomere.
vi. How can you differentiate between tetany and tetanus?
vii. How vernalization is beneficial for plants?
viii. Compare oviparous with viviparous.
ix. What type of organisms are present in Limenitic zone of a lake ecosystem?
x. How many deserts are in Pakistan? Write their names and location.
xi. Why the tress are called environmental buffers?
xii. How is ozone layer being depleted?

3. **Write short answers of any eight parts from the following:** (8x2=16)

i. Why AB Blood group is universal recipient?
ii. What is the role of recombination frequency?
iii. Why Heaemophilia A is more common in males than females?
iv. What is the role of thyroxine?
v. Differentiate between Meissner's corpuscles and Pacinian corpuscles.
vi. What are the Similarities between nervous and chemical coordination?
vii. What are the advantages of transgenic Bacteria?
viii. How many possible ways to get the gene of interest?
ix. Differentiate between ex-vivo and in-vivo gene therapy.
x. Why is a biosphere absent on moon?
xi. What is the importance of food web?
xii. How succession act as community relay?

4. **Write short answers of any six parts from the following:** (6x2=12)

i. Why is growth pattern in plants called "open growth"?
ii. Why is cleavage pattern in chick called "Discoidal Cleavage"?
iii. Mention the types of chromosomes depending upon the location of centromere.
iv. Define semi-conservative hypothesis of DNA replication.
v. What is the critical change in gene that leads to sickle cell disease?
vi. What is mitotic apparatus?
vii. Write any two importances of meiosis.
viii. What is theory of special creation?
ix. Define gene pool.

SECTION-II

Note **Attempt any three questions. Each question carries equal marks:** (8x3=24)

5. (a) Describe major homeostatic functions of liver. 4
(b) What is cell cycle? Diagrammatically mention its different stages. 4
6. (a) Write some major functions of skeletal system. 4
(b) Define Xerosere, describe its various stages. 4
7. (a) How is resting membrane potential replaced by action membrane potential across neurolema? Explain all the factors in this replacement. 4
(b) Discuss the evidences of evolution from comparative embryology and molecular biology. 2+2=4
8. (a) Explain different physiological and structural changes occurring during the process of birth in human being females. 4
(b) Define probability. Derive 9:3:3:1 ratio of independent assortment through product rule. 4
9. (a) Describe the phases of growth in plants. 4
(b) Explain the importance of transgenic plants.

No [redacted] to be filled in by the candidate

(For All Sessions)

(Group-II)

Biology (Objective)

Time: 20 Minutes Marks : 17

Rwp-12-2-23

Note: Write Answers to the Questions on the objective answer sheet provided. Four possible answers A, B C and D to each question are given. Which answer you consider correct, fill the corresponding circle A, B, C or D given in front of each question with Marker or Pen ink on the answer sheet provided.

1.1. Which of the following is not a heterotherm?

(A) Bat (B) Humming bird (C) Duckbilled Platypus (D) Flying bird

2. The inactive, non conducting wood is called:

(A) Heartwood (B) Sapwood (C) Secondary Phloem (D) Primary Xylem

3. Total number of facial bones is:

(A) 22 (B) 14 (C) 12 (D) 16

4. Which of the following is wrong statement?

(A) Adrenaline releases glucose from liver glycogen (B) Non-adrenaline releases glucose from liver glycogen (C) Sympathetic system is reinforced by epinephrine and nor-epinephrine (D) Pupil dilates by parasympathetic system

5. Etiolated plants possess:

(A) No chlorophyll (B) Chlorosis (C) Insufficient chlorophyll (D) Higher chlorophyll

6. Fruit set means:

(A) Retention of seed (B) Retention of fruit (C) Retention of ovary (D) Pregnancy

7. Which of the following is responsible for secondary growth in plants?

(A) Lateral meristem (B) Vascular cambium (C) Cork cambium (D) All A, B & C

8. Helix of DNA has diameter:

(A) 2 nm (B) 2 μm (C) 2.3 nm (D) 3.4 nm

9. The semi conservative replication model predicted by Watson and Crick was confirmed by:

(A) Meselson & Stahl (B) Hershay & Chase (C) Vernon Ingram (D) Fredrick Sanger

10. Crossing over take place during:

(A) Zygotene (B) Pachytene (C) Diplotene (D) Diakinesis

11. Which chromosome carries gene for leukemia?

(A) Chromosome 9 (B) X-chromosome (C) Chromosome 19 (D) Chromosome 11

12. Which of the following bio-technology product has been produced in mammalian milk?

(A) Hemophilia factor VIII (B) Insulin (C) Anti-Thrombin III (D) Human growth hormone

13. The gene for Retinitis pigmentosa is present on:

(A) X-chromosome (B) Y-chromosome (C) Chromosome 7 (D) Chromosome 11

14. Alzheimer is a / an:

(A) Nutritional disease (B) Hormonal disease (C) Mental disorder (D) Physical disease

15. The first photosynthetic organism probably used _____ for reducing CO_2 to sugars.

(A) Pentose sugars (B) Hydrogen sulfide (C) Hydrogen carbide (D) Both A & B

16. Solar energy used for evaporation of water and heating up soil is about:

(A) 90% (B) 1% (C) 99% (D) 95%

17. Which of the following statement is false:

(A) 11% of the total area of the world is under cultivation (B) 2% of water is in the form of frozen ice (C) An area having less than 10 to 20 inches rains is called desert (D) Early man was first a secondary consumer

Biology (Subjective) (For All Sessions) (GROUP-II) Time: 2:40 hours

Rwp-12-2-23

SECTION-I

2. **Write short answers of any eight parts from the following:** (8x2=16)

i. Skin does not come within the definition of excretory organ, comment.
ii. Differentiate between Endotherms and ectotherms
iii. How is Osmoregulation done in Hypotonic and Hypertonic environment?
iv. What is difference between tetanus and muscle tetany?
v. What is the role of ATP in muscle fatigue?
vi. How is Turgor pressure generated?
vii. Define diplohaplontic life cycle
viii. What is the role of non-disjunction in diploid parthenogenesis?
ix. Write the names of four major ecosystems on land in Pakistan.
x. Differentiate between phytoplanktons and zooplanktons.
xi. What do you know about hydroelectric power?
xii. Mention any four ways in which we can save energy.

3. **Write short answers of any eight parts from the following:** (8x2=16)

i. Why birth control pills contain progesterone?
ii. How pancreas help humans as an endocrine gland?
iii. Why iodine is added into the table salt?
iv. How protanopia, deuteranopia and tritanopia area differentiated?
v. What is pleiotropy? Give two examples.
vi. Define epistasis and how it is confused with dominance?
vii. How genetic engineers produce a salt tolerant plant Arabidopsis?
viii. What are transgenic plants?
ix. How cancer is treated through gene therapy?
x. How certain fungi area crucial for higher plants in acidic soils?
xi. Describe the role played by bacteria in nitrogen cycle.
xii. How food web is more stable than food chain?

4. **Write short answers of any six parts from the following:** (6x2=12)

i. Highlight the role of morphogenetic determinant during development of an individual.
ii. What is discoidal cleavage?
iii. Differentiate between sense strand and antisense strand of DNA
iv. How mRNA in eukaryotic cell remain protected from nucleases and phosphateses?
v. Where codon and anticodon are situated?
vi. Differentiate between necrosis and apoptosis.
vii. How cytokinesis occurs in plants?
viii. What are endangered species? Give two examples from Pakistan.
ix. What are Hydrothermal vents?

SECTION-II

Note **Attempt any three questions. Each question carries equal marks:** (8x3=24)

5. (a) Describe thermal regulatory strategies in mammals including humans in cold temperature. 4
(b) Define Meiosis? Explain Meiotic – 1st, with diagram. 4
6. (a) Explain appendicular skeleton of mammals. 4
(b) Describe nitrogen cycle. 4
7. (a) Describe how a controlling mechanism is itself controlled by products of a reaction by giving an example? 4
(b) Describe different factors which effect the gene frequency of a population. 4
8. (a) What are placenta, write the functions of placenta during pregnancy. 4
(b) Define Mendel's law of segregation. Explain it with an example. 4
9. (a) Highlight the role of external environmental factors in controlling the growth in plants. 4