

**Note:** You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question. Attempt as many questions as given in objective type question paper and leave others blank.

1. The producers in limnetic zone are  
(A) amoebae (B) cyanobacteria (C) hydrilla (D) crustaceans
2. Which respiratory protein is found in all aerobic species?  
(A) glial cell line (B) cytochrome (C) serine (D) cysteine
3. The position of a gene on the chromosome is called  
(A) allele (B) synapse (C) locus (D) linkage
4. A plant has a growth pattern called  
(A) open growth (B) growing point (C) meristem (D) apical
5. The pairing of homologous chromosomes is completed in  
(A) leptotene (B) zygotene (C) pachytene (D) diplotene
6. Sunkens stomata are found in which of the following group of plants?  
(A) hydrophytes (B) xerophytes (C) mesophytes (D) bryophytes
7. The diameter of skeletal muscle fibres is  
(A) 10 – 80  $\mu\text{m}$  (B) 10 – 100  $\mu\text{m}$  (C) 10 – 120  $\mu\text{m}$  (D) 10 – 135  $\mu\text{m}$
8. In Honey bees male / drones are haploid and produce sperms by  
(A) oosphere (B) ecesis (C) mitosis (D) meiosis
9. The division of whole cell is called  
(A) karyokinesis (B) cytokinesis (C) interphase (D) kinetochore
10. The colour of the pure form of ozone ( $\text{O}_3$ ) is  
(A) whitish (B) yellowish (C) bluish (D) greenish
11. Energy from sun flows through an ecosystem in the form of  
(A) light (B) radiant heat (C) temperature (D) evaporation
12. How many base pairs are found in the human genome?  
(A) three billion (B) five billion (C) thirty billion (D) forty trillion
13. Highly condensed portions of the chromatin are called  
(A) euchromatin (B) hetero chromatin (C) supercoils (D) centromeres
14. Which animal has diffused nervous system?  
(A) octopus (B) earthworm (C) planaria (D) jelly fish
15. The inner soft wall of the human uterus is called  
(A) ectometrium (B) exome trium (C) endometrium (D) myometrium
16. The synovial joint is surrounded by a layer of connective tissue called  
(A) fibrous capsule (B) hyaline cartilage (C) annulus fibrosus (D) hematoma
17. The fever causing chemical substances in human are  
(A) pathogens (B) poisons (C) pyrogens (D) pyrexia

(SECTION - I)**2. Write short answers to any EIGHT questions.**

(2 x 8 = 16)

- Differentiate between hypotonic and hypertonic environments.
- Discuss the process of osmoregulation in mesophytes
- Differentiate between shivering thermogenesis and non-shivering thermogenesis.
- Elaborate locomotion in star fish.
- Differentiate between plantigrade and digitigrade mammals.
- How locomotion takes place in jelly fish?
- What is diplohaplontic life cycle? Give its types.
- Define parthenocarpy? Give two examples.
- Enlist ecosystems in Pakistan.
- What is human impact on tundra ecosystem?
- Why forests are called environmental buffers?
- Write a note on forest and climate.

**3. Write short answers to any EIGHT questions.**

(2 x 8 = 16)

- Name the four types of learning behaviour.
- Give any two characteristics of hormones.
- What is neuroglia? Give its role.
- What is haemophilia? Give its different types.
- Differentiate between autosomes and sex chromosomes.
- Define Mendel's law of segregation.
- What are palindromic segregation?
- What are restriction enzymes?
- Name any four animals declared extinct in Pakistan.
- Differentiate between nitrification and denitrification.
- Distinguish between hydrosere and xerosere.
- Define food chain and food web.

**4. Write short answers to any SIX questions.**

(2 x 6 = 12)

- Differentiate between area opaca and area pellucida.
- What are neoblasts? Give their role.
- Define phenylketonuria.
- Enlist non-sense codon. Give their function.
- What is phosphodiester bond?
- Define cell cycle.
- Define non-disjunction of chromosomes.
- What is endosymbiont hypothesis? Give example.
- Name any four factors affecting gene frequency.

(SECTION - II)

- Describe the mechanism of thermoregulation in mammals.
  - Describe the components of ecosystem.
- Describe locomotion in air.
  - Discuss the experiment of Frederick Griffith (Transformation).
- Compare the nervous system of planaria with hydra.
  - Write a note on greenhouse effect.
- Discuss the human female reproductive cycle.
  - Write a note on incomplete dominance.
- Describe embryonic induction.
  - Describe comparative embryology and fossil record as an evidence of evolution.

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