KAMARAJ COLLEGE (Autonomous)

Accredited with A+ Grade by NAAC

(Affiliated to Manonmaniam Sundaranar University, Tirunelveli)

(3 Pages) **Reg. No:……**

Question Code: 26E01614 **Course Code : 24PEMB41**

PG Degree - End Semester Examinations, April 2026

Fourth Semester

M.Sc., MICROBIOLOGY

Life Sciences for Competitive Examinations

(For those who joined in July 2024 onwards)

Time : 3Hours **Maximum : 75 Marks**

PART – A (10 × 1 = 10 Marks)

Answer ALL Questions

Choose the correct answer :

CO:1 K:1 1. What is the approximate number of base pairs per turn in a B-DNA helix?

(a) 10.5 (b) 11

(c) 12 (d) 9

CO:1 K:2 2. Which of the following is considered the weakest intermolecular force?

(a) Ionic bond (b) Hydrogen bond

(c) Covalent bond (d) Vander Walls Force

CO:1 K:1 3. Which is the correct sequence of phases in the cell cycle?

(a) $M \rightarrow G1 \rightarrow G2 \rightarrow S$ (b) $G1 \rightarrow G2 \rightarrow S \rightarrow M$

(c) $G1 \rightarrow S \rightarrow G2 \rightarrow M$ (d) $S \rightarrow G1 \rightarrow G2 \rightarrow M$

CO:1 K:2 4. Photoreactivation is a type of _____

(a) Excision repair (b) Recombination repair

(c) Direct repair (d) Mismatch repair

CO:1 K:1 5. The tendency of genes present on the same chromosome to stay together during inheritance is called:

(a) Independent assortment (b) Genetic Linkage

(c) Crossing over (d) Gene Interaction

CO:1 K:2 6. Hemophilia is an example of which type of inheritance?

(a) Autosomal recessive (b) Autosomal dominant

(c) X-linked recessive (d) Y-linked

CO:1 K:1 7. The gradual and predictable change in the species composition of a given area is called_____

(a) Evolution (b) Ecological succession

(c) Biomass increase (d) Nudation

CO:1 K:2 8. When was Project Tiger officially launched in India?

(a) 1970 (b) 1972

(c) 1973 (d) 1975

CO:1 K:1 9. The Hardy-Weinberg principle states that:

(a) Allele frequencies in a population change over time.

(b) Evolution occurs rapidly in large populations.

(c) Allele and genotype frequencies remain constant from generation to generation in a large, randomly mating population.

(d) Genotype frequencies depend on which allele is dominant.

CO:1 K:2 10. Which of the following is considered the "clock of aging" in the body?

(a) SCN (b) Pineal gland

(c) Thymus gland (d) Pituitary gland

PART – B (5 X 5 = 25 Marks)

Answer ALL Questions choosing either (a) or (b).
Answer should not exceed 250 words.

CO:2 K:2 11. (a) Develop the classification of carbohydrates.

(OR)

(b) Explain the issues associated with the deficiency of water-soluble vitamins.

CO:3 K:2 12. (a) Describe the features of genes.

(OR)

(b) Extract the benefits of recombination.

CO:2 K:2 13. (a) Explain the second law of Gregor mendel.

(OR)

(b) Analyze the facts about human genetics.

CO:3 K:5 14. (a) Argue on the types of habitat.

(OR)

(b) Quote the characters of ecological niches.

CO:2 15. (a) Explain the features of allopatricity.

K:2

(OR)

(b) Discuss the importance of sexual selection.

PART – C (5 X 8 = 40 Marks)

Answer ALL Questions choosing either (a) or (b).

Answer should not exceed 600 words.

CO:5 16. (a) Evaluate the contributions of Watson and Crick in the field of genetics.

K:2

(OR)

(b) Describe the structural aspects of proteins.

CO:4 17. (a) Explain and evaluate the process of semi-*conservative DNA* replication.

K:2

(OR)

(b) Criticize deeply on the process of transcription with neat sketches.

CO:2 18. (a) Explain gene mapping and describe techniques used for mapping genes.

K:3

(OR)

(b) Classify the different types of human genetic disorders with examples.

CO:3 19. (a) Analyze the interactions between biotic and abiotic factors in the environment.

K:4

(OR)

(b) Explain the ecological importance of biosphere reserve located in south India.

CO:2 20. (a) Explain the major theories of evolution.

K:2

(OR)

(b) Describe migration, its types and biological importance.