KAMARAJ COLLEGE (Autonomous)

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(Affiliated to Manonmaniam Sundaranar University, Tirunelveli)

(4 Pages) **Reg. No:……**

Question Code: 26E00603 **Course Code : 24UMZO31**

UG Degree - End Semester Examinations, April 2026

Third Semester

B.Sc., ZOOLOGY

Cell Biology

(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. Who was the first scientist to observe and name cells from a slice of cork?

(a) Antonie van Leeuwenhoek (b) Matthias Schleiden

(c) Robert Hooke (d) Theodor Schwann

CO:1 K:2 2. In the process of differential centrifugation, which cellular component will pellet first at the lowest speed?

(a) Mitochondria (b) Ribosomes

(c) Nuclei (d) Microsomes

CO:2 K:1 3. The main function of the cytoplasm is

(a) To store genetic material (b) To serve as a medium for metabolic reactions

(c) To control cell division (d) To synthesise protein

CO:2 K:2 4. Which of the following cellular components is found in plant cells but is absent in animal cells?

(a) Cell wall (b) Mitochondria

(c) Cytoplasm (d) Nucleus

CO:3 K:1 5. The primary function of lysosomes in an animal cell is

(a) Energy production (b) Protein synthesis

(c) Detoxification of the cell (d) Digestion of cellular waste and foreign material

CO:3 K:2 6. The Golgi complex is responsible for

(a) Synthesizing lipids (b) Modifying, sorting and packaging proteins and lipids

(c) Breaking down waste materials (d) Organizing microtublules

CO:4 K:1 7. The double-layered structure that encloses the nucleus is called as

(a) Plasma membrane (b) Nuclear envelope

(c) Endoplasmic reticulum (d) Nucleolus

CO:4 K:2 8. Find out the site of ribosomal RNA (rRNA) synthesis is

(a) Chromosome (b) Nucleolus

(c) Nuclear pore (d) Mitochondria

CO:5 K:1 9. In which phase of mitosis where chromosomes align at the equatorial plate?

(a) Prophase (b) Anaphase

(c) Metaphase (d) Telophase

CO:5 K:2 10. Programmed cell death is also called as

(a) Apoptosis (b) Necrosis

(c) Senescence (d) Carcinogenegis

PART – B (5 X 5 = 25 Marks)

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

Answer should not exceed 250 words.

CO:1 K:3 11. (a) Explain the cell fractionation and differential centrifugation mechanism with example.

(OR)

(b) Describe the working principle of a phase-contract microscope.

CO:2 K:4 12. (a) Analyse the structural differences between a typical plant cell and an animal cell.

(OR)

(b) Compare and contrast the basic structure of virus and bacteria.

CO:3 K:4 13. (a) With the help of labeled diagram, analyse the fluid mosaic model of plasma membrane.

(OR)

(b) Examine the ultra-structure and functions of Golgi apparatus with an illlustration.

CO:4 K:4 14. (a) Differentiate heterochromatin and euchromatin with examples.

(OR)

(b) Discover the process of semi-conservative replication of DNA with an illustration.

CO:5 K:4 15. (a) Compare and contrast mitosis and meiosis cell devisions.

(OR)

(b) Examine the major characteristics of cancer cells.

PART – C (5 X 8 = 40 Marks)

Answer ALL Questions choosing either (a) or (b).
Answer should not exceed 500 words.

CO:1 K:5 16. (a) Explain the principles of differential centrifugation and density gradient centrifugation of cell fraction.

(OR)

(b) Evaluate the importance of staining. Differentiate the vital staining and the fixed-cell staining.

CO:2 K:5 17. (a) Explain the composition of the cytoplasm and the functions of their components.

(OR)

(b) Portray the bacterial cell with neat diagram.

CO:3 K:4 18. (a) Analyse the structure of mitochondria and microtubules with neat labeled diagram.

(OR)

(b) Explain the physical and molecular structure of endoplasmic reticulum.

CO:4 K:6 19. (a) Discuss the ultrastructure and functions of the nucleus with a neat labeled diagram.

(OR)

(b) Elaborate the steps of protein synthesis and its regulation at transcriptional and translational levels.

CO:5 20. (a) Organize the stages of mitosis with neat labeled diagrams and explain its biological significance.

(OR)

(b) Identify on the molecular mechanisms of apoptosis and its role in ageing and cancer.