

S.S.R. DEGREE COLLEGE, (AUTONOMOUS)
NIZAMABAD (C.C:5029)
I SEMESTER INTERNAL ASSESSMENT I EXAMINATIONS
QUESTION BANK
BIOTECHNOLOGY

I. Multiple Choice Questions.

1. The basic structural and functional unit of life is: (B)
a) Tissue b) Cell c) Organelle d) Atom
2. Prokaryotic cells lack: (B)
a) DNA b) Nucleus c) Ribosomes d) Cell membrane
3. Which organelle is known as the "powerhouse of the cell"? (C)
a) Chloroplast b) Ribosome
c) Mitochondria d) Golgi apparatus
4. Ribosomes are the site of: (C)
a) DNA replication b) Lipid synthesis
c) Protein synthesis d) Respiration
5. Fluid Mosaic Model of plasma membrane was proposed by: (A)
a) Singer and Nicolson b) Watson and Crick
c) Schleiden and Schwann d) Meselson and Stahl
6. Lysosomes are rich in : (B)
a) DNA b) Digestive enzymes
c) Ribosomal RNA d) Chlorophyll
7. The term *chromosome* was first coined by: (A)
a) Waldeyer b) Sutton c) Flemming d) Boveri
8. Chromosomes are mainly composed of: (A)
a) DNA and proteins b) RNA and proteins
c) Lipids and proteins d) Carbohydrates and proteins
9. The visible constriction in a chromosome is called: (B)
a) Chromatid b) Centromere c) Kinetochore d) Telomere
10. The end portions of chromosomes are known as: (B)
a) Chromomeres b) Telomeres c) Centrosomes d) Kinetochores
11. Which of the following prevents fusion of chromosomes? (B)
a) Centromere b) Telomere c) Nucleolus d) Histones
12. Mitosis is also known as: (B)
a) Reduction division b) Equational division
c) Meiotic division d) Amitosis
13. The process of mitosis was first described by: (B)
a) Gregor Mendel b) Walther Flemming
c) Sutton and Boveri d) Hugo de Vries
14. During which phase of mitosis do chromosomes align at the equatorial plate? (B)
a) Prophase b) Metaphase
c) Anaphase d) Telophase

15. Separation of sister chromatids takes place during: (C)
 - a) Prophase
 - b) Metaphase
 - c) Anaphase
 - d) Telophase
16. In which phase of mitosis does the nuclear envelope reappear? (D)
 - a) Prophase
 - b) Metaphase
 - c) Anaphase
 - d) Telophase
17. Meiosis occurs in: (B)
 - a) Somatic cells
 - b) Germ cells
 - c) Muscle cells
 - d) Neurons
18. The main significance of meiosis is: (B)
 - a) Growth of body cells
 - b) Maintenance of chromosome number across generations
 - c) Protein synthesis
 - d) DNA repair
19. Crossing over occurs during: (A)
 - a) Prophase I
 - b) Prophase II
 - c) Metaphase I
 - d) Telophase II
20. Which of the following is NOT a substage of Prophase I? (C)
 - a) Leptotene
 - b) Pachytene
 - c) Metaphase
 - d) Diplotene
21. At which stage of meiosis does independent assortment of chromosomes occur? (B)
 - a) Anaphase I
 - b) Metaphase I
 - c) Prophase II
 - d) Telophase I
22. Synaptonemal complex is formed during: (B)
 - a) Leptotene
 - b) Zygotene
 - c) Pachytene
 - d) Diplotene
23. The separation of homologous chromosomes occurs during: (A)
 - a) Anaphase I
 - b) Anaphase II
 - c) Telophase I
 - d) Metaphase II
24. Senescence in plants refers to: (A)
 - a) Aging and death of cells, organs, or the whole plant
 - b) Germination of seeds
 - c) Differentiation of tissues
 - d) Increase in photosynthesis
25. Which hormone primarily delays senescence in plants? (C)
 - a) Auxin
 - b) Gibberellin
 - c) Cytokinin
 - d) Absciscic acid
26. The "senescence factor" in plants is often associated with: (A)
 - a) Ethylene
 - b) Cytokinin
 - c) IAA (Indole-3-acetic acid)
 - d) Gibberellic acid
27. In animals, cellular senescence is often triggered by: (A)
 - a) Shortening of telomeres
 - b) Increased protein synthesis
 - c) Higher mitochondrial activity
 - d) DNA repair efficiency

28. Apoptosis is also known as: (A)
 a) Programmed cell death b) Necrosis
 c) Autophagy d) Cell proliferation
29. Which of the following is a characteristic feature of apoptosis? (B)
 a) Cell swelling and lysis
 b) DNA fragmentation into nucleosomal units
 c) Inflammation in surrounding tissue
 d) Random degradation of DNA
30. Which family of proteins regulates apoptosis? (B)
 a) Cyclins b) Bcl-2 family
 c) Heat shock proteins d) Histones

II. Fill in the blanks

1. The Mitochondria is known as the "powerhouse of the cell."
2. The Nucleus controls all the activities of the cell and contains genetic material.
3. Ribosomes are the sites of protein synthesis.
4. The Rough endoplasmic reticulum is associated with ribosomes, while the Smooth ER is not.
5. The Golgi apparatus(Golgi complex) is responsible for packaging and secretion of proteins.
6. Lysosomes are digestive organelles containing hydrolytic enzymes.
7. The Cell wall provides structural support and helps in maintaining the shape of plant cells.
8. Chloroplasts store pigments and are responsible for photosynthesis in plant cells.
9. The Plasma membrane is a semi-permeable barrier that regulates entry and exit of substances.
10. The Centrosome / Centrioles is involved in cell division and formation of spindle fibers in animal cells.
11. The stage of the cell cycle where mitosis occurs is the M phase.
12. The longest phase of mitosis is Prophase
13. The stage where chromosomes align at the equatorial plate is called Metaphase.
14. The structure that attaches chromosomes to spindle fibers is the Kinetochores.
15. The phase in which sister chromatids separate and move to opposite poles is called Anaphase.
16. Reappearance of the nuclear membrane and nucleolus occurs during Telophase.
17. Meiosis occurs only in germ cells to produce gametes.
18. Crossing over occurs during Prophase I.
19. The structure formed by homologous chromosomes during synapsis is called a bivalent or tetrad.
20. The protein structure that holds homologous chromosomes together during synapsis is the synaptonemal complex.
21. The points where crossing over occurs are called chiasmata.
22. Independent assortment of chromosomes occurs during Metaphase I.
23. Homologous chromosomes separate during Anaphase I.
24. The protein p53, known as the "guardian of the genome," plays a key role in initiating senescence in response to DNA damage.
25. The process of programmed cell death is called apoptosis, which is distinct from senescence.
26. Senescence can be categorized into two types: replicative senescence and stress induced senescence.

III. Descriptive questions

1. Write ultra-structure of prokaryotic cell in detail with labelled diagrams.
2. Write ultra-structure of eukaryotic cell in detail with labelled diagrams.
3. Discuss in detail about mitosis with labelled diagrams.
4. Discuss in detail about meiosis with labelled diagrams.
5. Write about senescence& apoptosis