REV-01
BSB/07/12

2023/12

SET A

B.Sc. BOTANY
THIRD SEMESTER (REPEAT)
CYTOLOGY & GENETICS
BSB-303
[USE OMR SHEET FOR OBJECTIVE PART]

Duration: 3 hrs. **Full Marks: 70**

(Objective)

Time: 30 mins. **Marks: 20**

Choose the correct answer from the following: ***1×20=20***

1. The membrane around the vacuole is known as:
   a. Tonoplast b. Elaioplast
   c. Cytoplast d. Amyloplast
2. Microfilaments are composed of a protein called:
   a. Tubulin b. Actin
   c. Myosin d. Chitin
3. Glycolipids in the plasma membrane are located at:
   a. Inner leaflet of the plasma membrane
   b. The outer leaflet of the plasma membrane
   c. Evenly distributed in the inner and outer leaflets
   d. It varies according to cell types
4. Which cell organelle is involved in apoptosis?
   a. Lysosome b. ER
   c. Golgi d. Mitochondria
5. Lysosomes are known as "suicidal bags" because:
   a. Parasitic activity b. Presence of food vacuole
   c. Hydrolytic activity d. Catalytic activity
6. Which of the following cell organelles does not contain DNA?
   a. Lysosome b. Nucleus
   c. Nucleus d. Mitochondria
7. Which of the following cell organelles is absent in prokaryotic cells?
   a. Nucleus b. Lysosome
   c. Endoplasmic Reticulum d. All of the above
8. Which of the following statements is true about chromosomes?
   a. It is present within the nucleus b. It carries genes and helps in inheritance
   c. It is composed of DNA in the form of Chromatin and protein d. All of the above

9. Nuclear DNA replicates in which phase?
   a. G2 phase
   b. M phase
   c. S phase
   d. None

10. The longest stage in the cell cycle is:
   a. Interphase
   b. Metaphase
   c. Anaphase
   d. None of the above

11. Chromosome structure can be observed best during:
   a. Interphase
   b. Metaphase
   c. Anaphase
   d. Telophase

12. After cross-fertilization of true-breeding tall and dwarf plants, the F1 generation was self-fertilized. The resultant plants have genotype in the ratio:
   a. 1:2:1 (homozygous tall : heterozygous tall : dwarf)
   b. 1:2:1 (heterozygous tall : homozygous tall : dwarf)
   c. 3:1 (tall : dwarf)
   d. 3:1 (dwarf : tall)

13. Which of the following characteristics of pea plants was not used by Mendel in his experiments?
   a. Seed colour
   b. Seed shape
   c. Pod length
   d. Flower position

14. If both genotype and phenotype shows the same ratios of 1:2:1 in the F2 generation, it shows:
   a. Incomplete dominance in monohybrid cross
   b. Complete dominance in monohybrid cross
   c. Dihybrid cross
   d. Co-dominance

15. This technique can be used to detect the chromosomal abnormality of an unborn baby:
   a. Tissue culture
   b. Ultrasound
   c. CAT Scanning
   d. Amniocentesis

16. Theory of linkage was put forward by:
   a. De Vries
   b. Sutton
   c. Bateson and Punnet
   d. Morgan

17. Consider this sequence A–O–B –C–D–E–F, be a DNA sequence where O is the centromere. Which of the following will be a pericentric inversion?
   a. A–O–B–D–E–F
   b. B–O–A–D–E–F
   c. D–B–O–A–E–F
   d. A–O–E–D–B–F

18. If the DNA strand has nitrogenous base sequence ATTGCC, the mRNA will have?
   a. ATTGCA
   b. UGGACC
   c. UAACGG
   d. ATCGCC

19. The type of coiling in B-DNA is:
    a. Zig-zag
    b. Left-handed
    c. Opposite
    d. Right-handed

20. During replication, Okazaki fragments elongate:
    a. Leading strand towards the replication fork
    b. Lagging strand towards the replication fork
    c. Leading strand away from the replication fork
    d. Lagging strand away from the replication fork

-- --- --

Descriptive

Time : 2 hr. 30 mins. Marks : 50

[Answer question no.1 & any four (4) from the rest]

1.	Write briefly about the mitosis cell division.	10
2.	Write down the Mendel's law with an example.	10
3.	Define chromosome aberration. Describe about the structural chromosomal aberration with the diagram.	2+8=10
4.	Define numerical chromosome aberration. Write a brief note on numerical chromosomal aberration.	2+8=10
5.	What is DNA replication? Write briefly about the different theory proposed to explain the DNA replication.	2+8=10
6.	Write a short note on mitochondria and Golgi bodies.	5+5=10
7.	Write briefly about the DNA double helix structure.	10
8.	Define exon and intron. Write briefly about the nucleosome solenoid model of DNA packing.	1+1+8=10

= = *** = =