**( NO. OF PAGES: 2 )**

**(FOR THE CANDIDATES ADMITTED DURING THE ACADEMIC YEAR 2023 ONLY)**

**23PBY207**

**REG.NO. :**

**N.G.M.COLLEGE (AUTONOMOUS) : POLLACHI**
**END-OF-SEMESTER EXAMINATIONS :MAY-2024**

**COURSE NAME: M.Sc.- BOTANY** **MAXIMUM MARKS: 75**
**SEMESTER: II** **TIME : 3 HOURS**

## CYTOLOGY, GENETICS AND PLANT BREEDING

### SECTION – A (10 X 1 = 10 MARKS)

**ANSWER THE FOLLOWING QUESTIONS.**
**MULTIPLE CHOICE QUESTIONS. (K1)**

1. The fluidity of the plasma membrane increases with_____.
   a) Increase in unsaturated fatty acids in the membrane.
   b) Increase in saturated fatty acids in the membrane.
   c) Increase in glycolipid content in the membrane.
   d) Increase in phospholipid content in the membrane.
2. The segregation of alleles on one trait did not have any effect on the segregation of alleles on a different trait. This is based on_____.
   a) Mendel's law of heredity b) Mendel's law of Independent assortment
   c) Mendel's law of dominance d) Mendel's law of segregation
3. Which of the following is not true about inversion?
   a) Inverted chromosomes are generally viable
   b) Inversion can cause chromosome breakage
   c) Two DNA strands with an inverted segment will not pair
   d) Inversion including centromere is known as paracentric.
4. Which of the following is not a trait that should be incorporated in a crop plant?
   a) Decreased tolerance to environmental stresses b) Increased yield
   c) Resistance to pathogens d) Increased tolerance to insect pests
5. Select one of the following which is not included in Germplasm collection_____.
   a) Wild relatives b) Old improved varieties c) Diseased varieties d) Pure lines

**ANSWER THE FOLLOWING IN ONE (OR) TWO SENTENCES. (K2)**

6. Explain the function of Lysosomes.
7. Define epistasis.
8. Interpret genetic code.
9. Explain polyploidy.
10. Illustrate heterosis.

### SECTION – B (5 X 5 = 25 MARKS)

**ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS. (K3)**

11. a) Examine the structure and functions of cytoskeleton.

**(OR)**

b) Describe the structure of chromosome.

12. a) Apply the protocol to construct genetic map.

**(OR)**

b) Show the cytoplasmic male sterility in plants.

**(CONTD.....2)**

13. a) Find out the causes of spontaneous mutation.

**(OR)**

b) Examine the epigenetic mechanism in plants.

14. a) List the objectives of plant breeding.

**(OR)**

b) Compute the merits and demerits of mass selection.

15. a) Interpret the theories governing hybrid vigour.

**(OR)**

b) Describe any four *ex-situ* methods of germplasm conservation.

**SECTION – C (5 X 8 = 40 MARKS)**

**ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.**

**(K4 (Or) K5)**

16. (a) Discuss the organization of prokaryotic cell.

**(OR)**

(b) Analyze the structural organization of eukaryotic cell.

17. (a) Determine the mechanism of sex in plants.

**(OR)**

(b) Evaluate the mechanism of crossing over and its significance.

18. (a) Prove DNA as genetic material with suitable experiments.

**(OR)**

(b) Categorize the intrachromosomal aberrations with its genetic siginificance.

19. (a) Recommend a suitable selection method to breed self-pollinated crops and its merits and demerits.

**(OR)**

(b) Summarize the protocol for clonal selection along with merits and demerits.

20. (a) Categorize the different types of hybridization with suitable illustration.

**(OR)**

(b) Examine the protection of plant varieties and farmer's right act.

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