

**B.Sc. BOTANY
FIFTH SEMESTER
PLANT BREEDING
BSB-504**

**SET
A**

[USE OMR SHEET FOR OBJECTIVE PART]

Duration: 3 hrs.

Full Marks: 70

Time: 30 mins.

(Objective)

Marks: 20

Choose the correct answer from the following:

1 × 20 = 20

1. To keep materials in isolation to prevent the spread of diseases, etc. present in them to other materials is known as:
 - a. Segregation
 - b. Quarantine
 - c. Isolation
 - d. Composite
2. Which of the following chemicals induces polyploidy in plants?
 - a. Colchicine
 - b. Formaline
 - c. 5-Bromouracil
 - d. Saffranine
3. The first man-made cereal 'Triticale' has been developed from a cross between:
 - a. Wheat and Oat
 - b. Wheat and Maize
 - c. Maize and Rice
 - d. Wheat and Rye
4. Euploidy is a chromosomal variation in.....
 - a. Size
 - b. Position of genes
 - c. Number
 - d. Structure
5.aims to improve the various characteristics of plants so that they become more desirable agronomically and economically.
 - a. Plant tissue culture
 - b. Hybridization
 - c. Crossing over
 - d. Plant breeding
6. Which of the following will be sterile?
 - a. Monoploid
 - b. Diploid
 - c. Triploid
 - d. Tetraploid
7. An Agricultural Research Institute was established in Pusa in:
 - a. 1902
 - b. 1904
 - c. 1905
 - d. 1906
8. Which of the following bacterium is considered as "a natural genetic engineer"
 - a. Agrobacterium tumefaciens
 - b. Agrobacterium radiobactor
 - c. Pseudomonas putida
 - d. Thermus aquaticus
9. Which of the following have been developed by mutation?
 - a. Knol knol variety of castor
 - b. Aruna variety of Barley
 - c. Erectiferum variety of cabbage
 - d. Reimei variety of rice
10. Father of Indian Green Revolution:
 - a. M.S. Swaminathan
 - b. Norman Borlaug
 - c. Gregor Mendal
 - d. Hardy Weinburg

11. The quickest method of plant breeding is:
 - a. Introduction
 - b. Selection
 - c. Hybridisation
 - d. Mutation Breeding
12. Which is true about heterosis?
 - a. Superiority of an F1 hybrid over its male parent
 - b. Superiority of an F1 hybrid over its female parent
 - c. Superiority of an F1 hybrid over both of its parents
 - d. None of the above
13. Who used the term heterosis for the first time?
 - a. Shull
 - b. Keith Downey
 - c. Thomas Andrew Knight
 - d. Niels Ebbsen Hansen
14.is when an organism is created with an abnormal number of chromosomes.
 - a. Aneuploidy
 - b. Diploid
 - c. Polyploidy
 - d. Haploid
15. Inbreeding increases the frequency of:
 - a. Homozygous
 - b. Heterozygous
 - c. Genetic diversity
 - d. Genetic linkage
16. Non-disjunction means:
 - a. Failure of homologous chromosomes to separate properly during cell division
 - b. Failure of formation of chromosomes
 - c. Failure of formation of centromere
 - d. Failure of formation of cytoplasm
17. Which of the following is not ionizing radiation?
 - a. X rays
 - b. UV rays
 - c. Cosmic rays
 - d. Alpha rays
18. Green revolution aims at:
 - a. Use of green manure
 - b. Grow more crops
 - c. High yield variety programme
 - d. All the above
19. Semi dwarf rice variety IR8 was developed in:
 - a. India
 - b. Taiwan
 - c. China
 - d. Philippines
20. Which of the following statements are true for Agrobacterium tumefaciens mediated gene transfer?
 - a. Vir genes are essential for gene transfer
 - b. T-DNA borders are essential for gene transfer
 - c. Both a and b
 - d. None of the above

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(Descriptive)

Time : 2 hr. 30 mins.

Marks : 50

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

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| 1. Explain Johannsen's pureline theory. Briefly describe the procedure for pureline selection. | 6+4=10 |
| 2. Give a list of central institutes for crop improvement. Briefly describe the organisation and functions of any two of the ICAR institutes. | 2+4+4=10 |
| 3. What is Ploidy? Discuss the different types of Ploidy. Highlight the role of Polyploidy in crop improvement and evolution with special reference to wheat. | 1+4+5=10 |
| 4. What is hybridization? Describe in brief the various steps involved in hybridization. | 2+8=10 |
| 5. Describe the process of <i>Agrobacterium tumefaciens</i> mediated gene transfer with necessary diagrams of Ti-plasmid. | 8+2=10 |
| 6. Outlined a generalised procedure for mutatuion breeding with special reference to oligogenic characters. | 10 |
| 7. What are the factors affecting seed germination? Discuss seed viability test of seed testing technique. | 4+6=10 |
| 8. Define heterosis. Discuss the different types of heterosis. | 2+8=10 |

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