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(November)

BOTANY

(Major)

Course : 503

(Genetics, Plant Breeding and Biostatistics)

Full Marks : 48

Pass Marks : 19

Time : 2 hours

*The figures in the margin indicate full marks
for the questions*

1. (a) Choose the correct answer : 1×2=2

(i) The superiority of an F_1 hybrid over both the parents is called pure vigor/inbred vigor/hybrid vigor.

(ii) Middle value of the variable (in ordered assay) that has an equal number of items on either side of it is called mode/median/mean.

(b) Express in *one* word : 1×3=3

(i) The fixed position of a chromosome occupied by a gene

(ii) A physical or a chemical agent which induces mutations

(iii) Replacement of purine base by another purine base

2. Write short notes on the following : 4+3+2=9

(a) Techniques of tissue culture

(b) Down's syndrome

(c) Test of significance

3. (a) What is sex-linked inheritance? Define different types of sex-linkage. Explain with an example that X-linked genes show criss-cross type of sex-linked inheritance. 1+3+4=8

Or

Differentiate autopolyploidy from allopolyploidy. Discuss the role of polyploidy in tracing origin and evolution of crop plants giving suitable examples. 2+6=8

(b) Write short notes on any *two* of the following : 3×2=6

- (i) Complementary factors
- (ii) Dihybrid test cross
- (iii) Translocation heterozygote

4. Define the term 'hybridization' and state its objectives. Discuss briefly the different steps of hybridization. What is backcrossing? 1+2+7+1=11

Or

Write explanatory notes on the following : 5½×2=11

- (a) Heterosis breeding
- (b) Mass selection and its importance

5. Give an account of the application of statistics in modern bio-sciences. Also mention the formula for chi-square (χ^2) test. 7+2=9

Or

Write short notes on any *two* of the following : 4½×2=9

- (a) Standard deviation
- (b) Laws of probability
- (c) Frequency distribution

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