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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) Express in one word : 1×3=3

(i) The sum total of plasmagenes present in cytoplasm of a cell or an organism

(ii) An alternative form of a gene

(iii) Exchange of chromosomal segments between two non-homologous chromosomes

(b) Fill in the blanks : 1×2=2

(i) Crossing of two plants belonging to the same species is called — cross.

(ii) The positive square root of the mean of squares of the deviations of any given observation from their mean is called —.

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

(a) Klinefelter syndrome

(b) Apomixis

• (c) Probability test

3. (a) What are monohybrid and dihybrid experiments? Define 'Law of Independent Assortment'. Prove with an example of incomplete linkage that this law is not applicable to linked genes.

2+2+4=8

Or

Distinguish gene mutation from genomic mutation. Describe briefly the different types of transition mutations found in living organisms.

3+5=8

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

(i) Dominant epistasis

(ii) XX female XY male type of sex determination

(iii) Inheritance of plastids

(iv) Transgenes

4. (a) Mention various methods of plant breeding. Define mass selection and pure-line selection. Describe briefly the pure-line method of selection in improvement of crops. 3+3+5=11

Or

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

(i) Mutation breeding

(ii) Importance and application of tissue culture in improvement of crops

(4)

5. (a) Define mean, median and mode. Calculate mean, median and mode from the data given in the following table :

$$3+6=9$$

<i>Class Interval</i>	<i>Frequency</i>
16-20	4
21-25	5
26-30	9
31-35	6
36-40	13
41-45	3
46-50	2
51-55	3
56-60	3
61-65	2

Or

- (b) What do you mean by test of significance? When and how is this test used in biological sciences? Discuss with a suitable example.

$$3+2+4=9$$
