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3 (Sem-3/CBCS) BOT HC 3

2021

(Held in 2022)

BOTANY

(Honours)

Paper : BOT-HC-3036

(Genetics)

Full Marks : 60

Time : Three hours

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

1. Answer the following questions as directed :
1×7=7

(a) Holandric genes on the differential segment of Y-chromosome are inherited only by —

(i) males

(ii) females

(iii) both parents

(iv) None of the above.

(Choose the correct answer)

Contd.

(b) Linked genes do not obey Mendel's _____ law. *(Fill in the blank)*

(c) How does expressivity differ from penetrance?

(d) The change in the sequence and position of genes (position effect) is the result of—

(i) duplication

(ii) translocation

(iii) inversion

(iv) deletion.

(Choose the correct answer)

(e) mtDNA shows —

(i) maternal inheritance

(ii) nuclear inheritance

(iii) paternal inheritance

(iv) None of the above.

(Choose the correct answer)

(f) What do you understand by the word 'Muton'?

(g) Define autosomes.

2. Answer the following questions briefly :

2×4=8

- (a) How can you determine that a pedigree is autosomal dominant?
- (b) State the significance of linkage.
- (c) What is allopolyploidy? Cite example.
- (d) Write the full form of EMS and DMS.

3. Answer **any three** of the following questions : 5×3=15

- (a) What is the difference between incomplete dominance and co-dominance? Cite examples.
- (b) Write a short note on Role of Transposons in Mutation.
- (c) 'It is said that inversion suppresses crossing over' — Explain.
- (d) Write a short note on Hardy-Weinberg law.
- (e) Write briefly on euploidy.

4. Answer the following questions : $10 \times 3 = 30$

(a) What is polygenic inheritance? Explain with a suitable example. $2+8=10$

OR

Explain different types of DNA repair mechanisms. What would be the consequences if DNA repair mechanisms were not there?

$6+4=10$

(b) What are sex chromosomes? Explain sex-linked inheritance with the help of an example. $2+8=10$

OR

What do you understand by extra-chromosomal inheritance? Discuss about chloroplast inheritance in Four o'clock plant. $2+8=10$

(c) Write a note on the CIB method of detection of mutation. 10

OR

What are chemical mutagens? Write in brief about base analogues and deamination. $2+8=10$