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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 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.  $2+8=10$