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3 (Sem-3 / CBCS) BOT HC 3

2025

BOTANY

(Honours)

Paper : BOT-HC-3036

(Genetics)

Full Marks : 60

Time : Three hours

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

Answer all questions.

1. Answer the following as directed : $1 \times 7 = 7$

(a) What are plasmagenes ?

(i) Genes that are present in the nucleus

(ii) Genes that are present in the plasmamembrane

(iii) Genes that are present in the cytoplasm

(iv) Genes that are present in the protoplasm

(Choose the correct answer)

(b) What is included inversion ?

- (i) Inverted segment which does not carry centromere
- (ii) Inverted segment which is re-inverted together with a segment which remain uninverted
- (iii) Inverted segment which undergo inversion again
- (iv) Inverted segment which lie adjacent to each other

(Choose the correct answer)

(c) What is Pseudo-dominance ?

- (i) It is the genetic effect of duplication
- (ii) It is the genetic effect of deficiency
- (iii) It is the genetic effect of translocation
- (iv) It is the genetic effect of inversion

(Choose the correct answer)

(d) The reciprocal cross in Non-Mendelian inheritance will yield _____ results.
(same/different)

(Put the correct answer)

(e) What is ploidy ?

- (i) Structural chromosomal aberration
- (ii) Numerical chromosomal aberration
- (iii) It is a sort of gene interaction
- (iv) Mutation

(Choose the correct answer)

(f) What is pleiotropic gene ?

- (i) A single gene controlling one character at a time
- (ii) A single gene controlling several characters at a time
- (iii) A gene which mask the effect of other gene
- (iv) None of the above

(Choose the correct answer)

(g) The phenotypic ratio of epistasis is —

(i) 9:3:4

(ii) 12:3:1

(iii) 1:2:1

(iv) 13:3

(Choose the correct answer)

2. Answer the following questions briefly :

2×4=8

(a) What is the difference between sex determination and sex differentiation ?

(b) What are sex limited genes ? Cite examples.

(c) What are aneuploids and what is the cause of their origin ?

(d) What is Position effect ?

3. Answer **any three** of the following

questions :

5×3=15

(a) Write a note on genetic drift.

(b) Write a note on Hardy-Weinberg equilibrium.

(c) What is inversion ? What is the difference between paracentric and pericentric inversion ?

2+3=5

(d) Discuss the cytological basis of crossing over.

(e) Write a short note on the molecular concept of gene.

4. Answer the following questions :

10×3=30

(a) Write a note on chemical mutagens.

10

Or

Explain multiple factor hypothesis of polygenic inheritance. Do they obey Mendel's Law ?

8+2=10

(b) What is duplication? Write the cytological and genetical effect of duplication.

2+4+4=10

Or

What is deletion? Write the cytological and genetical effect of deletion.

2+4+4=10

(c) Discuss Mendel's law of Independent assortment. Mention the reasons why he succeeded in his experiment.

7+3=10

Or

What do you mean by maternal inheritance? Discuss with a suitable example.

2+8=10
