

B. Sc. DEGREE EXAMINATION, APRIL 2018
BRANCH V (a) – PLANT BIOLOGY AND PLANT BIOTECHNOLOGY
SIXTH SEMESTER

COURSE : MAJOR – CORE
PAPER : GENETICS, PLANT BREEDING AND EVOLUTION
TIME : 3 HOURS MAX. MARKS: 100

SECTION A

Answer all the questions. (18 MARKS)

I. Choose the correct answer: (5 x 1 = 5)

- The cross between the F1 hybrid and the homozygous recessive parent is called
[a] Back cross [b] Out cross [c] Test cross [d] Reciprocal cross
- The genetic condition of individuals in Klinefelter's syndrome is
[a] XYY [b] XXX [c] XXY [d] XYY
- The genotypic ratio of a dihybrid cross is
[a] 9:3:3:1 [b] 9:3:7 [c] 9:6:1 [d] 3:1
- Exchange of genes between non-sister chromatids of homologous chromosomes produces
[a] recombinants [b] aberrations [c] mutations [d] aneuploids
- Which one of the following is an example of Y linked inheritance?
[a] Haemophilia [b] Hypertrichosis
[c] Colour blindness [d] Defective tooth enamel.

II. Fill in the blanks: (5 x 1 = 5)

- Skin colour in human beings is governed by -----.
- Alternate forms of a gene are called -----.
- Sex determination in *Melandrium alba* is by ----- method.
- Reproductive isolation results in ----- speciation.
- Trisomy of Chromosome 21 results in -----.

III. State whether True or False: (4 x 1 = 4)

- Sickle cell anaemia is the result of translocation.
- Ear length in maize is governed by multiple alleles.
- Pureline selection results in homozygosity.
- Geographical isolation leads to allopatric speciation.

IV. Match the following:**(4 x 1 = 4)**

- | | |
|-----------------------------|------------------------|
| 15. Duplicate genes | [a] Raphanobrassica |
| 16. Amphidiploid | [b] X-linked recessive |
| 17. Criss cross inheritance | [c] 1:2:1 |
| 18. Incomplete dominance | [d] 15:1 |

IV. Answer any SIX of the following, each answer should not exceed 50 words: (6 x 3 = 18)

19. Maternal inheritance.
20. Incomplete dominance
21. Coupling and Repulsion.
22. Chiasma theory.
23. Clonal selection
24. Genetic counselling.
25. Inhibitory genes.
26. Gene mapping.
27. Chemosynthetic origin of life.

SECTION – B**Answer any FOUR of the following, each answers not exceeding 200 words. (4 x 6 = 24)**

28. State the laws of Mendelian inheritance and give a brief explanation.
29. With a suitable example, explain multiple gene inheritance.
30. Describe linkage in maize.
31. Point out the merits and applications of pureline selection.
32. Give an account of the genetic basis of Down's syndrome.
33. Discuss the mechanisms of speciation.

SECTION – C**Answer any TWO of the following, each answers not exceeding 1000 words. (2 x 20 = 40)**

34. Write an essay on gene interaction encountered in co-dominance, epistasis and complementary genes.
35. Describe sex linked inheritance with reference to Colour blindness and Haemophilia.
36. List the objectives of plant breeding and explain hybridization techniques.
37. Discuss the salient features of the theories of evolution you have studied.
