

# BankimSardar College

B.Sc. Honours SemesterIV Examination

2020

Botany Honours

Paper: Genetics (CC10)

Class Attendance: 10 Marks

Time: 2 Hours

Full Marks: 90

Answer of each group should be in separate answer sheet

Group: A

(All questions are compulsory)

1. Answer all questions.

[1 X 10 = 10]

- a. A diploid population having individuals with different chromosome numbers ranging from  $2n + 3$  to  $2n - 3$  is a
- Aneuploid
  - Polyploid
  - Ditriploid
  - Tridiploid
- b. Given a chromosome segment  
a  $\xrightarrow{10}$  b  $\xrightarrow{20}$  c  
with 40% interference, the frequency of double crossover will be
- 20%
  - 10%
  - 1.2%
  - 0.12%
- c. Two genes a and b present on the same chromosome shows 12% recombination. The distance between them is
- 0.12 map units
  - 1.2 map units
  - 12 map units
  - 120 map units
- d. The garden pea (*Pisumsativum*) has 14 chromosome in each of its body cells. The number of linkage groups expected in the species is
- 7
  - Less than 7

- iii. Between 7 and 14
- iv. 14
- e. If a cross is made between two plants of Aa Bb Cc Dd and Aa bb CC DD genotypes, then what will be the expected frequency of obtaining a progeny with AA Bb Cc DD?
  - i. 1/128
  - ii. 1/64
  - iii. 1/16
  - iv. 1/32
- f. The most widespread but distinctive cytogenetic process involved in the speciation of higher plants is
  - i. Apomixis
  - ii. Polyploidy
  - iii. Autosomal mutation
  - iv. Linkage
- g. What is the pattern of inheritance called in when the phenotype is influenced by many genes?
  - i. Dihybrid cross
  - ii. Monohybrid cross
  - iii. Epistasis
  - iv. Polygenic inheritance
- h. Crossing over leads to
  - i. Dominance of gene
  - ii. Recombination of linked genes
  - iii. Linkage between genes
  - iv. Regulation of genes
- i. A cell that has only one set of chromosome is said to be
  - i. Diploid
  - ii. Haploid
  - iii. Polyploid
  - iv. Allopolyploid
- j. A plant resulting from the combination of chromosome sets from different species is said to be
  - i. Allopolyploid
  - ii. Autotetraploid
  - iii. Polyploid
  - iv. Autopolyploid

**Group B**

**(Attempt all questions)**

**[10 X 3 = 30]**

2. Discuss the principle, requirements, and procedure for the study of meiotic chromosome.

[3+2+5]

3. Discuss the identifying characteristics of abnormal stages of meiosis — laggard bridge and ring chromosome.

[5+5]

4. Discuss the identifying characteristics of abnormal stages of mitosis — sticky bridge and multipolarity.

[5+5]

### Group C

5. Attempt all questions

[10 X 2 = 20]

- a. What is Transposon?
- b. What is split gene?
- c. What is base analogue?
- d. What is test cross?
- e. Define point mutation?
- f. What is Homoeotic gene?
- g. What is frame shift mutation?
- h. What is co-efficient of coincidence?
- i. Difference between complete and incomplete linkage.
- j. What is Triticale?

6. Attempt any 6 questions

[6 X 5 = 30]

- a. Discuss epistasis with example
- b. Write a short note on aneuploidy.
- c. Write a short note on inversion type of chromosomal aberration.
- d. Discuss One Gene—one polypeptide concept.
- e. Briefly discuss the Holliday model of crossing over.
- f. Discuss the molecular mechanism of tautomerisation.
- g. Write a short note on repetitive DNA.
- h. Discuss the ABCDE quartet model of flowering.

