B.Sc SEM IV
BOT-A
CC 10 (GENETICS)
Theory
2020

Time 2 hours

Section A

FM 25

1. Answer any five of the following **5×5=25**

a) Distinguish between euploidy and aneuploidy. Explain in brief the importance of amphidiploidy in the origin of one crop species. 2+3

b) Explain with an example polygenic inheritance in plants. 5

c) A plant heterozygous for AaBbCc was crossed with aabbcc and 1000 progenies were classified as follows: ***ABC-44; abc-43; AbC-148; aBc-150; Abc-305; aBC-310; ABc-0; abC-0***. Calculate the map distance and find the correct gene order. 5

d) Write the molecular mechanism of the following mutagen:

(i) UV rays (ii) 5BU 2½+2½

e) What is dominant epistasis? Explain with suitable example. 2+3

f) State the meiotic behavior of different kinds of trisomics. 5

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Section B

FM 15

2. Answer the following question

i) What is the F2 ratio of complementary gene interaction? Cite an example of this type of interaction. 2

ii) What is test cross? 2

iii) What is transversion? 2

iv) Name one base analogue. 1

v) Name one physical mutagen. 1

vi) Write down the gametes from AaBbCc 1

vii) The diploid number of an organism is 12. How many chromosomes would be expected in a monosomic and nullisomic condition? 2

viii) What is the difference between chromosome and gene? 2

ix) What are loci? 2

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Section C

FM 10

3. Choose the correct alternative from the following question.

i. Which of the following ratio shows supplementory gene interaction?

a) 9:7 b) 9:3:4 c) 1:2:1 d) 9:3:3:1

ii. What is an allele?

a) Characteristics of an organism b) Alternate forms of genes c) Homologous chromosomes d) Pair of centrioles

iii. What is the maximum percentage of recombination frequency between two genes?

a) 75% b) 100% c) 50% d) 25%

iv. If a recombination event of three points crossing produces 6 Double Cross Over, 142 Single Cross Over and 352 No Cross Over. What will be the percentage cross over between the terminal genes.
a) 10% b) 20.8% c) 14.8% d) 30.8%

v. Which of the followings is hexaploid?

a) Wheat b) maize c) cotton d) Oat

vi. A condition in which the organisms have more than two complete sets of chromosomes is called:

a) Polyploidy b) Euploidy c) aneuploidy d) None

vii. Linkage results in _____

a) Formation of more Dominant phenotype b) Formation of more Wild phenotype c) Formation of more parental phenotype d) Formation of more recombinant phenotype

viii. Double cross over involving _____ strands result in 100% recombinant strands.

a) 1 b) 2 c) 3 d) 4

viii. 9 : 3 : 3 : 1 ratio is modified to 9 : 7 ratio due to

a) Complementry gene b) Epistatic gene c) Hypostatic gene d) Supplementry gene

ix. Which of the following relationship was not studies by Mendel?

a) Flower colour and seed colour b) Height and seed colour c) Flower colour and shape of pollen grain d) Height and seed coat colour

x. The interchange of parts between non-homologous chromosomes is called:

a) Duplication b) translocation c) Inversion d) Deletion