

Use separate answer
script for each group.

M.Sc.Examination, 2019
Semester-II
Botany
Paper: MBC-21
(Cytology & Genetics)

Time: 3 Hours

Full Marks: 48

Questions are of value as indicated in the margin

Group A (Cytology)

Answer *any three* questions

1. Write short notes on: 2×4=8
 - a) NPC
 - b) Characteristics of nuclear lamina
 - c) Satellite DNA
 - d) Chromosome scaffold
2. State the characteristics of NOR. With suitable experimental evidences establish that nucleolus plays a key role in ribosome biogenesis. 2+6=8
3. What are polytene chromosomes? Why are the salivary gland chromosomes of *Drosophila melanogaster* considered as model system in mutation research? How is the gene activity experimentally visualized in polytene chromosomes? 1+2+5=8
4. Discuss the molecular events occurring in different stages of cell cycle. Briefly elucidate the molecular regulation of cell cycle. 3+5=8
5. At which stage of the cell cycle, histone proteins are synthesized? What is meant by "Histone Code"? Discuss the various types of modifications of histones that regulate the gene expression, nucleosome assembly and chromosome condensation. 1+2+5=8

Group- B (Genetics)

Answer *any three* questions.

1. Write short notes on: 2×4= 8
 - a) IS elements
 - b) Gene Silencing
 - c) Pleiotropism
 - d) Multiple alleles
2. What is meant by repressible and inducible gene regulation? Distinguish between composite and non-composite transposons. Briefly explain the molecular mechanism of transposition. 3+2+3=8

P.T.O.

(2)

3. What is meant by base substitution mutation? Briefly explain the molecular mechanism of excision repair and mismatch repair. 2+6=8
 4. Draw the structure of codon anticodon base pairing. Explain the ribosome binding technique and repetitive sequencing technique for deciphering of codon. 2+6=8
 5. Write down the mechanism of dosage compensation for X linked genes in mammals. Describe the various mechanism of sex determination in plants. 3+5=8
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