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PG (CBCS)

M.Sc. Semester-III Examination, 2022

BOTANY

PAPER: BOT 301

(CELL BIOLOGY, GENETICS & BIOTECHNOLOGY)

Full Marks: 40 **Time: 2 Hours**

Write the answer for each unit in separate sheet

The figures in the right-hand margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.

UNIT: 301.1: CELL BIOLOGY, GENETICS

Marks: 20

GROUP-A

1. Answer any two questions of the following: **2×2=4**

a) What is transposable element? Mention role of Copia element.

b) Mention the activity of telomerase.

c) What is co-dominance?

d) Mention different functions of endoplasmic reticulum.

GROUP-B

2. Answer any two questions of the following: **4×2=8**

a) Give a short note on deciphering of genetic code.

b) Distinguish between the dominant and recessive epistasis.

c) Write down functions of different histone and non-histone proteins in chromosome

d) Write note on banding pattern of chromosome.

GROUP-C

3. Answer any one question of the following: **8×1=8**

a) What is a Hardy-Weinberg assumption? Illustrate the general rule for estimating allele frequencies from genotype frequencies. If the genotypes **AA**, **Aa** and **aa** have frequencies 0.6, 0.2 and 0.2 (respectively), what are p= freq (**A**)? q= freq (**a**)? After a single generation of random mating, what is the expected frequency of **AA**, **Aa** and **aa**? If the genotypes **AA, Aa** and **aa** have fitnesses 1: 1.5: 1:6, What allele is fixed? 2+3+3

b) Why extra chromosomal inheritance is mentioned as maternal inheritance? Mention different types of maternal inheritance with examples. 2+6

UNIT: 301.2: BIOTECHNOLOGY

Marks: 20

GROUP-A

1. Answer any two questions of the following: **2×2=4**

a) Distinguish between RFLD and RAPD.

b) What is blue/white selection?

c) Define chromosome walking.

d) What do you mean by palindromic sequence?

GROUP-B

2. Answer any two questions of the following: **4×2=8**

a) Give a short note on RNA processing.

b) Give a short note on cDNA library preparation.

c) Mention the process of Southern bloting.

d) Give short note on PCR.

GROUP-C

3. Answer any one question of the following: **8×1=8**

a) Define somaclonal variation. Schematically represent the procedure of micropropagation. Mention different sterilization procedure used for tissue culture. 1+ 4+3

b) Define recurrent parent. Describe the procedure of back cross methods for transfer of dominant gene. 2+6

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