

U.G. 3rd Semester Examination - 2020
Molecular Biology & Biotechnology
[HONOURS]

Course Code : MBBT-H-CCR-T-5

Full Marks : 40

Time : $2\frac{1}{2}$ Hours

The figures in the right-hand margin indicate marks.

Candidates are required to give their answers in their own words as far as practicable.

Answer all the questions.

1. Answer any **five** questions from the following:

$2 \times 5 = 10$

- a) In what respect constitutive heterochromatin differs from facultative heterochromatin?
- b) Mention the role of Rec A and Rec BCD during recombination in bacteria.
- c) Why is *Arabidopsis thaliana* considered as a suitable organism for genetic experiment?
- d) What is meant by packaging of DNA?
- e) What are the genes which play key role in controlling cell cycle in Yeast?
- f) What inference you can draw from iojap inheritance in maize?

- g) How will you distinguish cytologically between a translocation homozygote and a translocation heterozygote?
- h) What are SINES and LINES?

2. Answer any **two** questions of the following:

$5 \times 2 = 10$

- a) What is the significance of satellite DNA. How does GC & AT rich regions of repetitive DNA can be detected on chromosome *in situ*.
- b) A normal woman, whose father had haemophilia, married a normal man. What is the chance of haemophilia in the children?
- c) What is VNTR? What do you mean by coupling & repulsion hypothesis? Explain by using a suitable example.
- d) Compare and Contrast the origins of Turner syndrome and Down syndrome? Why are they called syndrome?

3. Answer any **two** questions of the following :

$10 \times 2 = 20$

- a) Define amphidiploidy. Elucidate schematically derivation of a tetraploid amphidiploid from two diploid species of wheat. In common wheat

[Turn over]

(n=21) nullisomics are known for each of the 21 chromosomes whereas no nullisomics are known in barley (n=7) – why? $2+6+2=10$

- b) What do you understand by (i) reductional division and (ii) equational division? Using sketches demonstrate that first meiotic division is partly reductional and partly equational. Also indicate the same is true for second division.

$$2+6+2=10$$

- c) What are exons and introns? Enumerate the different steps during chain initiation and termination during polypeptide synthesis.

- d) Discuss the role of following in determining the phenotype or phenotypic ratio : (1) Pleiotropic genes and (2) Penetrance. $5+5=10$
