

M.Sc 3rd Semester Examination, 2019

BOTANY

PAPER – BOT-301

Full Marks : 40

Time : 2 hours

Answer **all** questions

The figures in the right hand margin indicate marks

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

Illustrate the answers wherever necessary

UNIT—I

[Marks : 20]

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

- (a) Name a human syndrome associated with organellar genome and give a brief account of it.

- (b) What is complementary gene action ? State its stereo.
- (c) Define inbreeding depression. State the basis of it.
- (d) What is dosage compensation ? Name the types of it.

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

- (a) Illustrate the ultrastructural features of nucleus.
- (b) Comment on unique features of polygenes.
- (c) Discuss Hardy-Weinberg hypothesis to explain allelic frequency in population genetics.
- (d) Derive relationship between population bottleneck, genetic drift and founder effect of a population.

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

- (a) Explain the basis of chromosome banding. Briefly mention the principle and procedure of G-banding. $4 + 4$
- (b) Mention four parameters with which traits of extranuclear inheritance can be identified. Explain maternal inheritance with a suitable example of it. $2 + 6$

UNIT—II

[Marks : 20]

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

- (a) What is a molecular probe for genetic analysis? How is it applied for the purpose?
- (b) Define heterosis. Explain transgressive inheritance.
- (c) How on the basis of concentration in solution macroelements and micro elements of plant

tissue culture medium are determined?
Name one compound, used in plant tissue culture medium, for providing each of macroelement and microelement.

(d) Give the full form of AFLP. Name the molecular biological techniques involved in this marker.

5. Answer any *two* of the following : 4 × 2

(a) Mention the properties of different types of restriction endonucleases.

(b) Discuss the mass selection procedure in plant breeding.

(c) Illustrate the principle and procedure of ISSR.

(d) Give a comprehensive account of the feature of cosmid. How does it differ from phagmid?

6. Answer any *one* of the following : 8 × 1

(a) Define properties of plasmid. Briefly describe Bacterial artificial chromosome. 2 + 6

(b) Distinguish between dedifferentiation and redifferentiation. What is a recalcitrant callus ? Illustrate callus culture mentioning its procedure and utilities. 1 + 1 + 6
