

(2.30 Hours)

Marks : 60

Note: Attempt **all** the questions.

All the questions carry equal marks.

- Q1 Answer ANY TWO of the following: (12)**
- (a) Discuss various factors affecting gynogenesis in plants.
 - (b) Write a note on different methods of protoplast fusion.
 - (c) Justify: Agrobacterium mediated plant transformations are extensively utilized.
 - (d) Elaborate on development of transgenic plants for quality improvement w.r.t. carbohydrates and lipids.
- Q2 Answer ANY TWO of the following: (12)**
- (a) Schematically explain establishment of a primary cell culture.
 - (b) Discuss the applications of transgenic cattle.
 - (c) Describe the method of procuring transgenic mice by the DNA microinjection method.
 - (d) Write a note on the general safety measures to be taken in an animal tissue culture laboratory.
- Q3 Answer ANY TWO of the following: (12)**
- (a) Discuss biosynthesis of nanomaterials.
 - (b) What are the features of an ideal nanocarrier molecule for drugs?
 - (c) Explain synthesis of nanometals by any three chemical methods.
 - (d) Discuss optical, mechanical and magnetic properties of nanomaterials.
- Q4 Answer ANY TWO of the following: (12)**
- (a) Write a short note on –Tumor suppressor genes (any three).
 - (b) Briefly discuss the applications of antisense RNA in medical biotechnology.
 - (c) Briefly discuss the social aspects of medical biotechnology.
 - (d) Write a short note on pharmacogenomics.
- Q5 (a) Define the following: (Any FOUR) (04)**
- (i) Organ culture
 - (ii) Gene silencing
 - (iii) Perfusion
 - (iv) *Ex vivo* gene therapy
 - (v) Nanowires
 - (vi) Nanobiotechnology
 - (vii) Myeloablation
 - (viii) Electroporation

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Q5 (b) **Give significance/ use of: (Any TWO)** (04)

- (i) Cybridization
- (ii) Cryopreservation of cell cultures
- (iii) Nanomedicine
- (iv) Preimplantation diagnosis

Q5 (c) **Give two examples of: (ANY FOUR)** (04)

- (i) Hydrogels used for making artificial seeds
- (ii) Herbicides used in plant cultivation
- (iii) Sources of adult stem cells
- (iv) Viral vectors used for gene therapy
- (v) Bacteria producing nanoparticles
- (vi) Continuous cell lines
- (vii) Nanosensors
- (viii) Molecular methods used for genetic testing
