Use Separate Answer Script for each Group

M.Sc. Examination, 2017
Semester-II
Botany
Course: MBC-23

Time: 3 Hours **Full marks: 48**

Questions are of value as indicated in the margin.

Group-A (Molecular Biology)

Answer ***any three*** questions

1. What is the purpose of making a cDNA library? What are the different types of primers used for cDNA synthesis? Diagrammatically represent the key steps involved in cDNA library construction. 2+2+4=8
2. What is the role of ddNTP in DNA sequencing? Why is Sanger sequencing reaction run on denaturing gel? Write four important applications of DNA sequencing. 2+2+4=8
3. What are the regulatory sequences that exist in an expression vector? Why is it necessary to overexpress proteins? How do you purify over-expressed His-tagged protein? 2+2+4= 8
4. Describe the basic features of a typical bacteria promoter with proper illustration. What is sigma 70? What is the role of C-terminal domain of the alpha subunit of bacterial RNA polymerase? 4+2+2=8
5. Write short notes on the following: 2x4=8
   a) DNA polymerase fidelity
   b) Two component gene regulation system
   c) Taq polymerase
   d) Central dogma

Group-B (Plant Biotechnology)

Answer ***any three*** questions

1. Write short notes on 2×4=8
   a) Synthetic seed technology
   b) Cryoprotectants
   c) Characteristics of compact callus
   d) Germplasm conservation
2. What are the characteristics of cell suspension culture? How are the fine cell suspension cultures established *in vitro* using friable callus? Mention two biotechnological applications of cell suspension culture. 2+4+2=8
3. What is meant by androgenesis? Why is pollen culture technique preferred to anther culture in production of haploid plants? Briefly outline the 'Nurse Culture' technique. Give two applications of haploidy. 1+1+4+2=8
4. Distinguish between shoot-tip and shoot-meristem culture techniques. Schematically describe the shoot tip culture technique proposed by Murashige. 2+6=8
5. Describe the isolation and purification of protoplasts using axenic plant parts. How is the cell wall regeneration detected in early stages of protoplast culture? What is the role of MPD in protoplast culture? 6+1+1=8
