

Use separate answer
script for each group.

M.Sc. Examination, 2019
Semester-II
Botany
Course: MBC-23
(Molecular Biology & Plant Biotechnology)

Time: Three Hours

Full marks: 48

Questions are of value as indicated in the margin

Group-A (Molecular Biology)

Answer *any three* questions

1. What is an expression system? Why is T7 phage promoter used in the construction of an expression vector for gene expression? How do you purify expressed His-tagged proteins?
2+4+2=8
2. What does riboprobe mean? Why is it necessary to use an optimal temperature for performing Southern Hybridization? How do you select the right temperature? Mention two applications of Southern hybridization.
2+2+2+2=8
3. What is meant by extended -10 promoter? What is its contribution to promoter activity? Describe how sequence specific promoter contacts are made by prokaryotic RNA polymerase during transcription initiation.
2+2+4=8
4. What is hot start PCR? Describe the replication fidelity and thermostability of non-recombinant *Taq* DNA polymerases. Name two enzymes used besides *Taq* polymerase in PCR reaction.
2+4+2=8
5. Write short notes on the following: 2×4=8
 - a. Klenow fragment
 - b. Restriction endonuclease
 - c. cDNA library
 - d. Okazaki fragment

Group- B (Plant Biotechnology)

Answer *any three* questions

1. Write short notes on: 2×4=8
 - a) Synthetic seeds
 - b) Cryoprotectants
 - c) Cytodifferentiation
 - d) Somatic hybrids

P.T.O.

(2)

2. What is meant by androgenesis? Schematically describe the steps involved in the production of haploid plants through pollen culture. Mention the applications of haploidy.
1+2+5=8
 3. What is an osmoticum? Which explants are best suited for isolation of protoplast and why is it so? Briefly elucidate the technique of isolation and purification of protoplast.
1+1+6=8
 4. How is a fine cell suspension culture obtained from friable callus tissue? Describe the various types of cell suspension cultures adopted in plant biotechnology. Mention the applications of cell suspension culture in plant biotechnology.
3+3+2=8
 5. How does shoot tip culture differ from shoot meristem culture? Discuss the technique of shoot tip culture proposed by T. Murashige. Why is shoot meristem culture considered as most suitable method for generation of virus free plant?
2+4+2=8
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