

Total number of printed pages = 4

63/2 (SEM-3) BOT-302

2022

(Held in 2023)

BOTANY

(Theory Paper)

Paper Code : BOT-302

(Molecular Biology and Plant Biotechnology)

Full Marks - 80

Pass Marks - 32

Time - Three hours

The figures in the margin indicate full marks for the questions.

1. Choose the correct answers for the following questions : 1×6=6

(a) Polymerase enzyme responsible for synthesizing m-RNA is

(i) RNA Poly-I (iii) DNA Poly-I

(ii) RNA Poly-III (iv) DNA Poly-II

(b) Type of receptor involved in transmitting signals through neurons is

(i) Enzyme-linked (iii) Ion channel gated

(ii) GPCR (iv) None of these

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(c) A recombinant DNA molecule is produced by joining together

- (i) two DNA segments
- (ii) one mRNA with a tRNA segment
- (iii) two mRNA molecules
- (iv) one mRNA with a DNA segment

(d) Restriction endonucleases have the ability of cutting

- (i) DNA at random sites
- (ii) DNA at specific sites
- (iii) Both (i) and (ii)
- (iv) DNA and RNA at random sites.

(e) A plant called *Ginkgo biloba* is under the threat of extinction. To save this plant, which technique is highly useful?

- (i) Genetic engineering
- (ii) DNA finger printing
- (iii) In vitro culture
- (iv) Hybridoma technology

(f) Recombinant DNA technology was discovered by

- (i) S. Cohen and H. Boyer
- (ii) J. D. Watson
- (iii) Sutton and Boveri
- (iv) Har Govind Khorana

2. Answer the following short questions : (All are compulsory) $2 \times 5 = 10$

- (a) Differentiate between rRNA and tRNA. 2
- (b) What does the term chemotaxis mean? Write its significance. $1 + 1 = 2$
- (c) What is GMO? How does it differ from a hybrid? $1 + 1 = 2$
- (d) What is an Intellectual Property Rights (IPRs)? 2
- (e) How is foreign DNA introduced into a host maintained by a host and transferred to successive generations? 2

3. Answer any two of the following questions :

$10 \times 2 = 10$

- (a) Define cell signalling. Explain the mechanism of any of the signalling system prevalent in plants. $2 + 8 = 10$

(b) Illustrate the various ways of damage caused to DNA. 10

(c) Briefly describe the process of achieving GMO. Mention its merits and demerits. 7+3=10

4. Write short notes on any six : 5×6=30

(a) Homologous recombination

(b) Enzyme linked receptors

(c) Cell based DNA cloning

(d) Process of plasmid purification

(e) Quorum Sensing

(f) Selectable and screenable marker

(g) Polymerase chain reaction

(h) Unique features of plant cells.

5. Answer any *one* broad question of the following :

14×1=14

(a) Elaborate in detail the process of transcription in prokaryotes. 14

(b) Briefly describe the various components of tissue culture media. Explain the process of sterilization of nutrient media and plant materials. Discuss the role of tissue culture in crop improvements. 7+4+3=14