Seat No. : _____

AI-129

April-2022

B.Sc., Sem.-VI

308 : Biotechnology

(Agriculture Biotechnology)

(New Course)

Time : 2 Hours] **[Max. Marks : 50**

Instructions : (1) **All** questions in Section – I carry equal marks.

(2) Attempt any **THREE** questions in Section – I.

(3) Question – **9** in Section – II is COMPULSORY.

(4) Draw figures where necessary. Show question number against each answer.

(5) Figures in right are marks.

SECTION – I

1. (A) Write a note on commercial cultivation of Apiculture. **7**

   (B) Explain importance of gene bank of endangered species and its applications. **7**

2. (A) Write a note on gene knockout technology. **7**

   (B) Describe gene transfer techniques in Chicken embryo. **7**

3. (A) Explain development of Bt cotton and its advantages and limitations. **7**

   (B) Describe gene transfer in chloroplast and its advantages over nuclear gene transfer. **7**

4. (A) Write a note on plant as bioreactor for vaccine. **7**

   (B) Describe vectorless gene delivery in plants. **7**

5. (A) Explain techniques of protoplast isolation, culture and its applications. **7**

   (B) Define somaclonal variation and its significance in plant tissue culture. **7**

6. (A) Write a note on Somatic embryogenesis. **7**

(B) What is surface sterilization? Write a note on MS medium used in Plant tissue culture. **7**

7. (A) Write a detailed note on Bioherbicides and its advantages over chemical herbicides. **7**

(B) Explain mechanism of Bt delta endotoxin with diagrams. **7**

8. (A) Describe seed bank and its significance. **7**

(B) Elaborate advantages and limitations of GM food and strategies to improve protein content. **7**

SECTION – II

9. Answer the following (any **Eight**) : **8**

(a) Define callus.

(b) Name two genes introduced to develop golden rice.

(c) What is therapeutic use of probiotics ?

(d) What is crown gall disease ?

(e) Write full form of RISC.

(f) What is helper plasmid ?

(g) Give two examples of edible vaccine.

(h) What is transformation efficiency ?

(i) Give Biotechnological importance of *Methylophilus methylotropus.*

(j) What is somaclonal variation ?

(k) Define callus.

(l) Write three differences between probiotic and prebiotic.

Seat No. : _____

AI-129

April-2022

B.Sc., Sem.-VI

308 : Biotechnology

(Agriculture Biotechnology)

(Old Course)

Time : 2 Hours] **[Max. Marks : 50**

Instructions : (1) **All** questions in Section – I carry equal marks.
(2) Attempt any **THREE** questions in Section – I.
(3) Question – **9** in Section – II is COMPULSORY.
(4) Draw figures where necessary. Show question number against each answer.
(5) Figures in right are marks.

SECTION – I

1. (A) Write a detailed note on commercial production of silk using sericulture. **7**
   (B) Write note on transgenic animals. **7**

2. (A) Explain gene transfer in fish and its applications. **7**
   (B) Illustrate gene knock-out technology in detail. **7**

3. (A) Write a note on Transgenic plants giving example of Golden rice. **7**
   (B) Elaborate Agrobacterium mediated gene transfer in plants and its applications. **7**

4. (A) Explain manipulation of Chloroplast and Mitochondrial genome and its advantages over genes transferred within nucleus. **7**
   (B) Discuss plant transformation by Electroporation and particle gun methods. **7**

5. (A) What is GM food ? Write parameters to improve GM foods with examples. **7**
   (B) Describe molecular action and expression of ∂-endotoxin of *B. thuringiensis.* **7**

6. (A) What is Probiotic ? Write a detailed note on probiotics and its applications. **7**
   (B) Discuss scope for genetic improvement of oil-seed crops using biotechnology. **7**

7. (A) Describe Structure, Genetic system, Replication and Pathogenesis of HIV. **7**
   (B) Discuss structure of TMV with labelled diagram. **7**

8. (A) Explain Structure and Pathogenesis of SARS. **7**
   (B) Describe Genetic system and Pathogenesis of Rabies virus. **7**

SECTION – II

9. Answer the following : (Any **eight**) **8**

(1) Intracytoplasmic sperm injection is a method of _____.
   (A) In vitro fertilization
   (B) Artificial Insemination
   (C) Production of transgenic animals
   (D) None of the given options are correct

(2) RNA interference process is used in the _____ technique.
   (A) Gene knock-in (B) Gene knock-down
   (C) Gene knock-out (D) None of the given

(3) _____ cannot be obtained directly from apiculture.
   (A) Beeswax (B) Honey
   (C) Royal jelly (D) Bee anti-venom

(4) _____ is widely used to create transgenic plants, animals as well as bacteria.
   (A) Sperm mediated gene transfer
   (B) Embryonic stem cell mediated transfer
   (C) Agrobacterium mediated gene transfer
   (D) Electroporation

(5) For pronuclear injection, _____ is preferred due to large size of pronucleus as compared to size of the gamete.
   (A) sperm
   (B) ovum
   (C) both male and female gamete equally
   (D) zygote

(6) The culturing of cells in liquid agitated medium is called:
   (A) Liquid culture (B) Agar culture
   (C) Suspension culture (D) Micropropogation

(7) Hairy root cultures for secondary metabolite production are induced by transforming plant cells with
   (A) Virus (B) Agrobacterium rhizogenes
   (C) Agrobacterium tumefaciens (D) Bacillus thuringiensis

(8) Name the technique which is used to enhance the life of a tomato.
   (A) Antisense technology (B) In vitro gene transfer
   (C) Ex vivo gene transfer (D) Molecular farming

(9) Which of the following has been widely used to provide resistance against plant viruses ?
   (A) Virus resistance genes from bacteria
   (B) Expression of virus coat protein genes in transgenic plants
   (C) Expression of anti-virus genes in vectors that transmit viruses
   (D) Expression of ribonuclease (RNase) genes in host plants

(10) Which of the following dies from Ti plasmid infection?
   (A) Rice (B) Corn
   (C) Sorghum (D) All of these