KATHMANDU UNIVERSITY
End Semester Examination
May/June, 2022

Marks scored:

Level : B.Tech.
Year : I
Course : BIOT 101
Semester : II
Exam Roll No. :
Time: 30 mins.
F. M. : 20
Registration No.:
Date : 14 June 2022

SECTION "A"
[10Q. × 0.5 = 5 marks]

Choose and tick [√] the most appropriate answer.

1. Somaclonal variation appears in plants
   [ ] growing in polluted soil or water
   [ ] raised in tissue culture
   [ ] exposed to gamma rays
   [ ] transformed by rDNA technology

2. Which of the following enzyme is used to join DNA fragments?
   [ ] Nuclease
   [ ] Ligase
   [ ] Restriction Enzymes
   [ ] polymerase

3. Ananda Chakrabarty received the first U.S. patent for a GM organism. This organism was
   [ ] a transgenic mouse expressing the growth hormone gene
   [ ] cloned E. coli
   [ ] Dolly the cloned sheep
   [ ] *Pseudomonas putida* engineered to degrade petroleum

4. Nucleoids are found in all
   [ ] plant cells
   [ ] bacterial cells
   [ ] bacterial cells, blue green algae
   [ ] plant cells, bacterial cells, blue green algae

5. Which amino acid can form disuphide bonds?
   [ ] Glycine [ ] Cysteine [ ] Proline [ ] Glutamate

6. Correctly matched pair is
   [ ] okazaki fragments- splicing
   [ ] RNA polymerase- RNA primer
   [ ] restriction endonuclease- genetic engineering
   [ ] central dogma-codon

7. Microorganism responsible for yoghurt production is
   [ ] *Lactobacillus*
   [ ] *Aspergillus*
   [ ] *Streptomyces*
   [ ] *Saccharomyces*

8. Any DNA molecule that has the ability to replicate in an appropriate host cell, to which the desired gene is integrated for cloning is called
   [ ] vector [ ] plasmid [ ] linker [ ] adapter

9. The most abundant carbohydrate in the nature is
   [ ] cellulose [ ] glycogen [ ] lignin [ ] chitin

10. T- DNA Transfer is regulated by
    [ ] *vir* genes [ ] *shi* genes [ ] *tra* genes [ ] *ocs* genes

SECTION "B"

[5Q. × 1 = 5 marks]

Fill in the blanks.

11. The first engineered plasmid vector is.....

12. Serum in animal cell culture media provides.....

13. Genetic material of Tobacco Mosaic Virus is.....

14. Hydrated synthetic seeds are encapsulated by.....

15. Root regeneration is stimulated by.....

SECTION "C"

[10Q. × 1 = 10 marks]

Define in one sentence.

16. Biogas:

17. Molecular Pharming:

18. MRSA:

19. Cryopreservation:

20. Bioethics:

21. Biofertilizer:

22. Phytovolatilization:

23. Gene therapy:

24. Somatic embryo:

25. Flavr Savr:

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Time : 2 hrs. 30 mins.

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Semester : II
F. M. : 55

SECTION "D"
(Long answer questions)
[3Q. × 7 = 21 marks]

1. What is somatic hybridization? Explain the various techniques used for the production of somatic hybrids and its application in Agriculture?

2. What is stem cell? Explain the various types of stem cells and its application in medicine?

3. Define rDNA technology? Explain briefly the various steps involved in recombinant DNA technology.

SECTION "E"
(Short answer questions)

4. Write short notes on: [6Q. × 4 = 24 marks]
   a. Types of cell culture
   b. Monoclonal antibodies
   c. IPR
   d. Micropropagation
   e. Bioremediation
   f. Fermentation

5. Give **TWO** major differences between: [2Q. × 2 = 4 marks]
   a. *In situ* and *ex situ* conservation
   b. B-Cell and T- cell

6. Explain **WHY/HOW** for the following: [3Q. × 2 = 6 marks]
   a. Protoplast is isolated using macerozyme enzymes.
   b. Cryoprotective agents are used during cryopreservation of animal cell lines.
   c. *Taq* polymerase is used in polymerase chain reaction.