KATHMANDU UNIVERSITY
End Semester Examination [C]
January 2025

Marks Scored:

Level : B.Tech..
Year : I

Course : BIOT 101
Semester : II

Exam Roll No. :

Time: 30 mins.

F. M. : 20

Registration No.:

Date : 12 JAN 2025

SECTION "A"
[10Q. × 0.5 = 5 marks]

Choose and mark [X] the most appropriate answer. Symbols have their usual meanings.

1. Which one of the following pairs is **NOT** correctly matched?
   [ ] *Streptomyces* ------ Antibiotic
   [ ] Rhizobium --------- Biofertilizers
   [ ] Serratia ---------- Drug addiction
   [ ] Spirulina ---------- Single cell protein

2. Virus free plant can be obtained through
   [ ] Grafting [ ] Callus culture [ ] *Shoot tip culture* [ ] Suspension culture

3. Which of the following hormones owes its discovery to tissue culture technique?
   [ ] Auxin [ ] Abscisic acid [ ] Gibberellin [ ] Cytokinin

4. Inulin is
   [ ] Protein [ ] RNA [ ] Carbohydrate [ ] Lipid

5. In high yielding hybrid crop varieties to exploit hybrid vigor, the farmers need to purchase fresh hybrid seed every year because:
   [ ] They are not allowed to grow their own seeds
   [ ] The hybrid vigor is lost due to inbreeding depression
   [ ] It is cheaper to purchase fresh seeds
   [ ] The Government of Nepal has accepted Dunkel's draft

6. *Someone with severe combined immune deficiency has no*
   [ ] Interferons [ ] Macrophages
   [ ] T or B cells [ ] Functioning lymph nodes

7. Which of the following bacterium is widely used as biopesticides?
   [ ] *Bacillus subtilis* [ ] *Bacillus thuringiensis*
   [ ] *Streptococcus lactis* [ ] *Lactobacillus acidophilus*

8. *One similarity between enzymes and hormones is that*
   [ ] Both are proteins [ ] Both are used in minute amount
   [ ] Both can be used again and again [ ] Both act at a particular pH

9. *Abnormal gene is replaced by normal gene through gene therapy,* the gene defects are cured in a child or
   [ ] Adult [ ] Embryo [ ] Old [ ] Teenage

10. *Hepatitis B and Herpes vaccines belong to*
    [ ] First generation vaccines [ ] Third generation vaccines
    [ ] Second generation vaccines [ ] Fourth generation vaccines

SECTION "B"

[5Q. × 1 = 5 marks]

Fill in the blanks.

11. δ-endotoxin is produced by _____.

12. _____ refers to the use of biotechnology in the field of medicine.

13. Cloning vector is _____.

14. Second Generation Biofuels are _____.

15. The delayed ripening tomato was created by Biotechnologist, who _____ a gene.

SECTION "C"

[10Q. × 1 = 10 marks]

Define in *one* sentence.

16. CRISPR

17. Transgenic organisms

18. Cryopreservation

19. Cry protein

20. Homolactic fermentation

21. Bioethics

22. Ex-situ conservation

23. Tay-Sachs disease

24. Ribozymes

25. Microbial Fuel cells (MFCs)

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January 2025

Level : B.Tech.
Year : I
Time : 2 hrs. 30 mins.

12 JAN 2025

Course : BIOT 101
Semester : II
F. M. : 55

SECTION "D"
[3Q. × 7 = 21 marks]

Attempt *ALL* questions.

1. What are carbohydrates? Explain the biological significances of carbohydrates.

2. What do you understand by chloroplast engineering? Why is this technique relatively advantageous than other genetic transformation techniques?

3. What do you understand by androgenic haploid plants? How tissue culture can be applied in sustainable agriculture?

OR

What does the immune system do? Mention and describe the types of Immunoglobulin.

SECTION "E"

4. Write short notes on. [6Q. × 4 = 24 marks]
   a. Molecular plant breeding
   b. Golden rice
   c. Principle of fermentation
   d. Biological patent
   e. Genetic counselling
   f. Gene therapy

5. Give **TWO** major differences between. [2Q. × 2 = 4 Marks]
   a. Medical molecular farming and non-medical molecular farming
   b. Classical biotechnology and modern biotechnology

6. Explain **WHY/HOW** for the following. [3Q. × 2= 6 Marks]
   a. DPT is triple antigen vaccine
   b. Microorganisms play a crucial role in the treatment of wastewater
   c. Bioinformatics is known as computational biology