



18049



## BRAINWARE UNIVERSITY

Term End Examination 2025-2026

Programme – M.Sc.(BT)-2024

Course Name – Animal Biotechnology

Course Code - MBT30113

( Semester III )

Library

Brainware University  
398, Ramkrishnapur Road, Barasat  
Kolkata, West Bengal-700125

Full Marks : 60

Time : 2:30 Hours

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

### Group-A

(Multiple Choice Type Question)

1 x 15=15

1. Choose the correct alternative from the following :

- (i) What is the temperature of liquid nitrogen?
  - a) -120 degree C
  - b) 0 degree C
  - c) -150 degree C
  - d) -196 degree C
- (ii) Select which of the following experiment is needed for detection of mycoplasma contamination is mammalian cell culture.
  - a) Southern blotting
  - b) ELISA
  - c) PCR
  - d) Western blotting
- (iii) Infer the method used for generation of Continuous Cell line by immortalization?
  - a) Viral Transduction
  - b) Telomerase RT Protein expression
  - c) Ras/Myc Overexpression
  - d) All of these
- (iv) Which of the following method is commonly used for transfer of DNA for generation of transgenics?
  - a) Microinjection
  - b) Gene Gun
  - c) Chemical transformation
  - d) All of these
- (v) Changes undergone by sperm in the female reproductive tract that enables them to penetrate and fertilize an egg is called
  - a) Motility
  - b) Dilution
  - c) Capacitation
  - d) Sensitization
- (vi) What is the primary purpose of superovulation in animal biotechnology?
  - a) To decrease the number of eggs for fertilization
  - b) To increase the number of eggs for fertilization
  - c) To synchronize reproductive cycles in males and females
  - d) To reduce mutations in population
- (vii) What is the primary role of protease inhibitors in transgenic plants?
  - a) Induce photosynthesis
  - b) Provide insect resistance
  - c) Increase nitrogen fixation
  - d) Enhance growth rate

(viii) CPCSEA stands for:

- |                                                                                   |                                                                   |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------|
| a) Committee for the Purpose of Control and Supervision of Experiments on Animals | b) Central Panel for Clinical and Scientific Ethical Approval     |
| c) Council for Prevention of Cruelty and Scientific Animal Experiments            | d) Committee for Public Control of Science and Ethical Activities |

(ix) Conclude which of the following is NOT an Assisted Reproductive Technology (ART) process?

- |                            |                    |
|----------------------------|--------------------|
| a) Artificial Insemination | b) Embryo Transfer |
| c) Seletive Breeding       | d) None of these   |

(x) Infer which of the following hybrids can theoretically survive in HAT medium?

- |                                |                       |
|--------------------------------|-----------------------|
| a) Bcell-Bcell                 | b) Bcell-Myleoma cell |
| c) Myeloma cells-myeloma cells | d) Both a and b       |

(xi) What is the function of an anti-idiotypic antibody vaccine?

- |                               |                                                  |
|-------------------------------|--------------------------------------------------|
| a) Neutralize toxins directly | b) Block enzyme activity                         |
| c) Provide passive immunity   | d) Mimic original antigen and stimulate immunity |

(xii) Evaluate management aspects of genetic engineering in farms. Best outcome?

- |                             |                                                 |
|-----------------------------|-------------------------------------------------|
| a) Excessive hormone misuse | b) Improved productivity with ethical oversight |
| c) Decreased animal health  | d) More ethical violations                      |

(xiii) A veterinary doctor administers blue tongue vaccine to sheep. What is the applied purpose?

- |                         |                               |
|-------------------------|-------------------------------|
| a) To boost growth rate | b) To prevent viral infection |
| c) To improve digestion | d) To increase fertility      |

(xiv) A lab uses recombinant technology to produce rabies vaccine. Which approach is applied?

- |                           |                              |
|---------------------------|------------------------------|
| a) DNA vaccine            | b) Live attenuated vaccine   |
| c) Fusion protein vaccine | d) Synthetic peptide vaccine |

(xv) Evaluate rabies vaccine application in stray dogs. Main challenge?

- |                                  |                             |
|----------------------------------|-----------------------------|
| a) Weak immune memory            | b) Poor antigen specificity |
| c) Large-scale coverage and cost | d) Lack of diagnostic kits  |

### Group-B

(Short Answer Type Questions)

3 x 5=15

- Describe the importance of FBS (Fetal Bovine Serum) in cell culture and its role in promoting cell growth. (3)
- What are the key steps involved in transgenic manipulation of animal embryos, from gene isolation to embryo implantation? (3)
- Explain the DNA microinjection technique in transgenic manipulation and how it leads to the generation of transgenic mice (3)
- Explain the role what does transgenic manipulation play in scientific research related to human diseases? (3)
- Evaluate the benefits and risks of using hormones to manipulate animal growth. (3)

OR

Recommend innovative solutions to overcome the limitations of organ and explant cultures, considering recent technological advancements in the field of biotechnology (3)

### Group-C

(Long Answer Type Questions)

5 x 6=30

- Illustrate the difference between Bt and non-Bt strategies for insect resistance. (5)

8. Analyse the advantages and limitations of using genetic manipulations for insect pest control. (5)
9. Explain different methods (maximum 5) for analysing the genome at the DNA level. (5)
10. Examine the types of common contaminants in cell cultures, their sources, and the strategies for preventing and controlling contamination in a laboratory setting. (5)
11. Describe the process of negative and positive selection in development of Knock out models of Mice. (5)
12. Evaluate the advantages and risks of using hormones for growth manipulation. (5)

**OR**

- Evaluate the importance of CPCSEA guidelines in maintaining ethical animal research. (5)

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