



BRAINWARE UNIVERSITY

Term End Examination 2023-2024

Programme – M.Sc.(BT)-2022

Course Name – Animal Biotechnology

Course Code - MBTE305

(Semester III)

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) Which PCR-based marker is particularly useful for studying genetic diversity in populations?
 - a) RAPD
 - b) STS
 - c) SSR
 - d) AFLP
- (ii) Describe the cell type for which hybridoma cells are used to produce
 - a) B cells
 - b) T cells
 - c) Protoplasts
 - d) Antibodies
- (iii) Analyze how does DNA fingerprinting help detection in clinical diagnostics?
 - a) Blood pressure
 - b) Genetic diseases and hereditary disorders
 - c) Brain activity
 - d) Digestive system functions
- (iv) How does DNA fingerprinting aid in plant breeding?
 - a) Identifying plant species
 - b) Selecting plants with desirable traits
 - c) Cloning plants
 - d) Inducing mutations in plants
- (v) What is the main limitation of AFLP markers in genetic studies?
 - a) Low polymorphism
 - b) Requirement for extensive sequence data
 - c) Complexity of analysis
 - d) Limited DNA amplification
- (vi) What is the primary goal of DNA fingerprinting in forensic science?
 - a) To solve mathematical problems
 - b) To create art
 - c) To establish connections between suspects and crime scenes
 - d) To compose music
- (vii) Choose the advantage of animal tissue culture
 - a) Cost effective
 - b) No skilled person is required
 - c) Cultures can be stored for long time
 - d) Maintenance of environmental condition is easy
- (viii) Naren wants to clone a human gene in E.coli system that can be used as a positive control in a diagnostic kit, which template should he use to make the clone.

- a) Human chromosomal DNA
b) Human cDNA
c) Bacterial chromosomal DNA
d) Bacteria cDNA
- (ix) Judge the significance of forward and reverse genetics in studying disease resistance in plants?
- a) Analyzing gene expression in plants
b) Identifying genes associated with specific diseases in plants
c) Evaluating the regulatory basis for disease resistance in plants
d) Studying evolutionary relationships in plants
- (x) The pH indicator in animal cell culture medium is
- a) HEPES
b) Phenol Red
c) FBS
d) L- glutamine
- (xi) Rimli's teacher asked her to sterilize Penicillin-Streptomycin antibiotics solution that can be added in the cell line during gene transfer, which procedure she should follow for sterilization
- a) Autoclaving
b) Filter sterilize through 0.22µm membrane filter
c) Filter sterilize through 0.45µm membrane filter
d) Filter sterilize through Whatman filter paper Grade I
- (xii) Monoclonal antibodies are referred as
- a) Magic guns
b) Magic bullets
c) Magic bombs
d) Magic shots
- (xiii) The growth of animal cells in vitro in a suitable culture medium is called
- a) Gene expression
b) Haploid culture
c) Plant tissue culture
d) Animal tissue culture
- (xiv) Select the suitable experiment which can be used to detect meat adulteration
- a) Multiplex PCR
b) RAPD
c) Real time PCR
d) All of the above
- (xv) Name the protein which first licensed as a therapeutic agent
- a) Bovine insulin
b) Human insulin
c) Chicken insulin
d) None of the above

Group-B

(Short Answer Type Questions)

3 x 5=15

2. Explain subunit vaccines and their benefits? (3)
3. What is Somatic Cell Nuclear Transfer (SCNT) in animal cloning, and how does it work? (3)
4. Explain how are transgenic animals bred to establish stable lines carrying the transgene? (3)
5. What are the key requirements for maintaining a sterile work area in cell culture? (3)
6. Provide an example of a commonly used DNA-based method for meat adulteration detection and explain its application (3)

OR

Explain the significance of a laminar flow hood in a cell culture laboratory (3)

Group-C

(Long Answer Type Questions)

5 x 6=30

7. Explain the differences between Fresh Embryo Transfer and Frozen Embryo Transfer (FET) in the context of in vitro fertilization (IVF) procedures, highlighting their respective advantages and challenges (5)
8. Explain different methods (maximum 5) for analysing the genome at the DNA level. (5)
9. Examine the types of common contaminants in cell cultures, their sources, and the strategies for preventing and controlling contamination in a laboratory setting. (5)

10. Suppose you are working in a contract research firm and get an assignment to clone, express and purify a mammalian recombinant protein in E.coli. Explain what are the bioinformatics approaches you should taken before initiation of the experiment? (5)
11. Discuss the essential steps involved in animal embryo culture, including the collection process, culture medium composition, and handling techniques. How do these steps ensure successful embryo development in vitro (5)
12. Suppose you are working in R&D lab and get an assignment to develop a molecularbiology based in vitro diagnostic kit to identify common enteric parasites. How will you design the experiment (5)

OR

Justify how DNA fingerprinting can be used to identify the parenthood of a child (5)
