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Sarasat, Kolkata -700125



BRAINWARE UNIVERSITY

Term End Examination 2024-2025

Programme – B.Sc.(BT)-Hons-2023

Course Name – Animal Biotechnology

Course Code - BBT40115

(Semester IV)

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) Select out the one that is NOT the part of growth medium for animal culture?
 - a) Starch
 - b) Serum
 - c) Carbon
 - d) Inorganic salts
- (ii) Recall, The cell culture technique became simpler only after advent of
 - a) Antibiotics
 - b) Trypsin
 - c) Cell culture media
 - d) All of these product
- (iii) Classify the process "The ability of cells to take up DNA fragments from surrounding"
 - a) transfection.
 - b) transduction.
 - c) transformation
 - d) conjugation.
- (iv) In transgenic fish, the genes are administered by
 - a) microinjection
 - b) viruses
 - c) transfer of whole nuclei
 - d) all of these
- (v) Describe the clinical application of adenovirus vectors in biotechnology
 - a) Pest control
 - b) Gene therapy
 - c) Antibiotic production
 - d) Vaccine production
- (vi) Identify the viral vector that integrates permanently into the host genome
 - a) Adenovirus
 - b) Baculovirus
 - c) Retrovirus
 - d) SV40
- (vii) Select the ethical issue related to germline editing
 - a) It only treats symptoms
 - b) Unintended genetic changes in future generations
 - c) Lack of funding
 - d) No long-term effects
- (viii) Determine why CRISPR is preferred over other gene-editing tools
 - a) Higher precision
 - b) Higher mutation rate
 - c) More expensive
 - d) Less efficient

- (ix) Select the main advantage of organoid formation
- a) Mimics real tissue function
 - b) Eliminates need for drug testing
 - c) Prevents genetic disorders
 - d) Reduces cell growth
- (x) Compare cord blood stem cells and embryonic stem cells
- a) Both are multipotent
 - b) Cord blood stem cells are less controversial
 - c) Embryonic stem cells are found in adults
 - d) Cord blood cells require gene editing
- (xi) Identify the main characteristic of stem cells from the below options
- a) They have the ability to self-renew and differentiate into specialized cells
 - b) They are specialized cells
 - c) They cannot divide
 - d) They can only form one type of cell
- (xii) Describe the function of the ROSA26 locus in gene transfer
- a) It ensures gene silencing
 - b) It provides a site for stable and constitutive gene expression
 - c) It prevents DNA from integrating into the genome
 - d) It is used for random transgenesis
- (xiii) Employ the biotechnology-based approach for controlling Coccidiosis
- a) Antibiotics
 - b) Gene editing
 - c) Vaccination
 - d) Herbal medicine
- (xiv) Apply method for diagnosing Foot-and-Mouth Disease in animals
- a) ELISA
 - b) MRI
 - c) X-ray
 - d) Ultrasound
- (xv) Identify the function of reverse transcriptase in retroviral gene transfer
- a) Converts RNA to DNA
 - b) Synthesizes proteins
 - c) Repairs damaged DNA
 - d) Degrades RNA

Group-B

(Short Answer Type Questions)

3 x 5=15

2. What are live-attenuated vaccines, and how do they work? (3)
3. Explain how the microinjection method works for creating transgenic mice. (3)
4. Explain briefly about ex vivo gene therapy (3)
5. Write the process of introducing a transgene into an animal's genome. (3)
6. Evaluate the advantages and limitations of the Baculovirus expression system compared to other eukaryotic expression systems, such as yeast and mammalian cells, in terms of protein yield and post-translational modifications. (3)

OR

Justify the key factors influencing the efficiency of Baculovirus-mediated protein expression in insect cells and discuss how these factors can be optimized for different types of proteins. (3)

Group-C

(Long Answer Type Questions)

5 x 6=30

7. Examine the significance of transgenic mice in biomedical research. Provide examples of their applications. (5)
8. Explain the process of Somatic Cell Nuclear Transfer (SCNT) and its role in generating transgenic animals. (5)
9. Examine the applications of animal cloning to enhance livestock production and genetic conservation. (5)
10. Analyze the ethical concerns associated with human genetic engineering. (5)
11. Analyze potential risks and benefits of using CRISPR for gene therapy (5)
12. Differentiate between totipotent, pluripotent, and multipotent stem cells with examples. (5)

OR

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