(i) Printed Pages : 3 Roll No. .....

(ii) Questions : 9 Sub. Code : 0 9 8 0

Exam. Code : 0 0 3 6

## B.Sc. (Hons) Biotechnology 4th Semester

## (2054)

## ANIMAL BIOTECHNOLOGY

## Paper : BIOT-404T

**Time Allowed : Three Hours]** **[Maximum Marks : 67**

**Note :—** (1) Attempt *five* questions in all.

(2) Question Number **1** is compulsory.

(3) Attempt *one* question from each Section.

1. Briefly answer the following :—

(i) Scaffold in Tissue Engineering. 2

(ii) Organotypic culture. 2

(iii) Perfusion Culture System. 2

(iv) Cryopreservation 2

(v) Somatic Cell Nuclear Transfer (SCNT). 2

(vi) Xenotransplantation. 2

(vii) Downstream processing. 2

(viii) Name any one antibiotic produced by using animal cell culture. 1

## SECTION—A

2. (A) Explain the process of gas and nutrient exchange in histotypic culture. Compare and contrast the advantages of histotypic culture over traditional monolayer cultures in studying tissue behaviour. 7

(B) Describe how organotypic cultures maintain structural integrity and support growth and differentiation of cells. 6

3. (A) Discuss the challenges associated with scaling up tissue engineering for clinical applications. 7

(B) What is the significance of live-cell imaging techniques in studying dynamic processes within 3D constructs ? 6

## SECTION—B

4. (A) Explain the process of in vitro fertilization (IVF) in humans. Highlight the key steps involved and discuss any ethical considerations associated with this technique. 7

(B) Explain the procedure of embryo transfer in livestock. Discuss its importance in animal breeding programs and any challenges encountered during the process. 6

5. (A) Compare and contrast cells as virus hosts and cells as protein factories in the context of cell culture-based vaccines. Discuss their respective advantages and limitations. 7

(B) Discuss the concept of personalized vaccines and how cells serve as antigen presenters in their development. 6

## SECTION—C

6. (A) Explore the potential of transgenic animals in drug development and pharmaceuticals. 7

(B) How can transgenic animals contribute to food production ? Provide examples. 6

7. (A) Discuss the applications of transgenic animal models in studying human diseases. Provide examples of transgenic animal models used to investigate cancer, neurodegenerative disorders and metabolic diseases. 7

(B) Discuss the ethical issues surrounding the creation and use of transgenic animals. 6

## SECTION—D

8. (A) Evaluate the potential of animal cell culture in the production of therapeutic proteins and monoclonal antibodies (mAbs). 7

(B) Enlist the potential risks associated with using animal cell culture for insulin production. 6

9. (A) Explain how animal cell culture is utilized in the production of human growth factors, insulin and other hormones. 7

(B) Discuss the advantages of animal cell expression systems for producing complex biologics with post-translational modifications. 6