

Code: 9A23805

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B.Tech IV Year II Semester (R09) Regular Examinations, March/April 2013

ANIMAL CELL SCIENCE AND TECHNOLOGY

(Biotechnology)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 Explain the equipments and materials used for animal cell culture technology.
- 2 What is the importance of gas phase and serum in cell cultures? What advantages and disadvantages serum in the medium.
- 3 Describe the cell counting methods and cell proliferation of animal cells in culture.
- 4 Explain the principle, procedure and applications of fluorescence activated cell sorter.
- 5 What is cell transformation? Describe the characteristic features of transformed cell lines.
- 6 Mention in detail the advantages of embryonic stem cells and their applications.
- 7 Describe the morphological and biochemical changes in apoptotic cell and measurement of cell death.
- 8 Explain the concepts of tissue engineering and its applications.

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Answer any FIVE questions
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- 1 What are the different characteristics animal cells in culture? Add a note on the features applicable in cells *in – vivo* is lacking in *in – vitro* cultures, strategy applied.
- 2 What is the importance of serum in cell cultures? What are the advantages and disadvantages of:
 - (a) Serum-supplemented medium.
 - (b) Serum-free medium.
- 3 Enumerate the principles and methods involved in membrane integrity assays and metabolic assays.
- 4 Explain with diagram the principle and procedure in centrifugal elutriation involved in cell separation.
- 5 What is cell synchronization? Explain the factors and methods for cell synchronization.
- 6 What are stem cells? Describe the types and applications of stem cells.
- 7 Describe the apoptotic changes and signaling pathways in apoptotic cells.
- 8 What is tissue engineering? Add a note on polymeric scaffold.

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- 1 Describe the structure and functions of an animal cell.
- 2 Explain the physical, chemical and metabolic functions of various constituents of culture medium with suitable example.
- 3 Write the principle and procedure for the following:
 - (a) XTT assay.
 - (b) Membrane integrity assay.
 - (c) Protein estimation.
- 4 Describe the methods used for disaggregation of tissues in animal cell cultures.
- 5 Write an explanatory note on:
 - (a) Cell cloning.
 - (b) Micromanipulation.
- 6 What are the general procedures for somatic cell hybridization?
- 7 Write the methods involved in Organotypic culture and Hystotypic cultures.
- 8 What is tissue engineering? Give detailed explanation about the tissue engineering.

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- 1 Draw a neat diagram on structure of the following cellular components and comment of their key functions:
 - (a) Intracellular junctions.
 - (b) Extracellular matrix.
- 2 List out the following components in the minimum essential medium and write their functions.
 - (a) Growth factors.
 - (b) Protein supplements.
 - (c) Amino acids.
- 3 Write the principle and procedure for the following:
 - (a) Lactate dehydrogenase assay.
 - (b) MTT assay.
 - (c) Colony forming efficiency.
- 4 Describe the methods used in measuring parameters of growth in animal cell culture.
- 5 Enumerate the types of cell cultures and describe the scale up of hollow fiber bioreactor.
- 6 What are stem cells its types and applications?
- 7 Define apoptosis and describe the typical characteristics of apoptotic cells.
- 8 What is tissue engineering? Give detailed explanation about the bone tissue engineering.
