

1128

B.Sc. (Hons.) Biotechnology

Third Semester

BIOT-Sem-III-V-T: Animal Cell Culture

Time allowed: 3 Hours

Max. Marks: 67

NOTE: Attempt five questions in all, including Question No. I which is compulsory and selecting one question from each Unit.

x-x-x

I. Attempt the following:-

- a) What are the major challenges in cell culturing?
- b) What is the difference between a primary explants and a cell culture?
- c) Explain dedifferentiation .What is its importance?
- d) What is senescence? How it is executed in the cell?
- e) What is The role of divalent ions in culture medium?
- f) What information is obtained on staining cells by trypan blue and neutral red?
- g) What are the hallmarks of a transformed animal cells?
- h) Explain the working of a laminar flow.
- i) Give two major applications of cell culture.
- j) What is the role of Animal Ethics Commence? (10x1½)

UNIT – I

- II.
 - a) Discuss the involvement of different proteins required for adhesion of cells to a solid surface.
 - b) Explain in detail the four phases of cell cycle. How is cell proliferation controlled at the molecular level? (6,7)
- III.
 - a) Describe different types of microscopes used in the cell culture laboratory?
 - b) What is the importance of CO₂ in cell culture? Compare water jacketed and dry walled CO₂ incubators. (6,7)

UNIT – II

- IV.
 - a) Explain the essential components of medium used to culture cells. What is a complete medium?
 - b) Why it is important to add serum to the culture medium? Compare tissue disaggregation by trypsin and collagenase. (6,7)

P.T.O.

(2)

- V. a) Describe different types of proteins present in serum and their function. Discuss the use of serum free medium for cell culturing.
- b) Explain different methods used to establish primary culture. Compare monolayer to suspension culture. (6,7)

UNIT – III

- VI. a) Name two commonly used cell lines. Explain their salient features, origin and applications.
- b) Why it is important to study the cytotoxicity of a new compound and how it is determined? (6,7)
- VII. a) Explain different methods to study the effect of a compound on the growth of cultured cells.
- b) What is stem cell plasticity? How is differentiation regulated? What are the methods to identify cells of different lineages? (6,7)

UNIT – IV

- VIII. a) What is the importance of cryopreservation of cells? How is the lethality reduced during freezing and thawing of cells?
- b) Why there is a need to authenticate the cell lines? Describe the methods used for authentication. (6,7)
- IX. a) Discuss the bioethical issues associated with the use of human samples.
- b) What is the importance of a biosafety cabinet? How a BSL2 is different from BSL3 facility. (6,7)