

Exam. Code: 0909
Sub. Code: 6310

2122
B.E. (Biotechnology)
Fifth Semester
BIO-513: Animal Cell Culture and Biotechnology

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit.

x-x-x

- I. Attempt the following:-
- What is an organ culture?
 - What are ECM? Give suitable examples?
 - What is Hank's Balanced Salt Solution and its application?
 - Who developed the technique of trypsinization?
 - Which antibiotics are supplemented in an animal cell culture medium?
 - What is a cryoprotectant?
 - What is a transgene?
 - What is isopycnic centrifugation?
 - What is oviductal embryo-transfer?
 - What is the use of sheath fluid in FACS technique? (10x1)

UNIT - I

- II. a) What are ECMs? Enlist their major types and describe their functions.
b) What is a histotypic culture? How it is maintained *in vitro*?
c) What is flow cytometry? Draw its schematic diagram, label various parts and describe their functions. (3,2,5)
- III. a) What is mathematical growth of mammalian cells? How it is determined?
b) What is isopycnic centrifugation? How it is helpful in separation of human mononuclear cells?
c) What is a roller bottle? Describe its concept, advantages if any, and various modifications for scaling up of mammalian cultures *in vitro*. (3,3,4)
- IV. Write short notes on any four of the following;
- CSTR
 - Microcarriers
 - Karyotyping
 - Diploid cell lines
 - Serum free media (4x2½)

P.T.O.

UNIT - II

- V. a) What are antimicrobial compounds? Describe various techniques used for preventing microbial contamination in an animal cell culture.
b) What are permeable and non-permeable cryoprotectants? Describe the principle of cryopreservation of mammalian cells.
c) What is transfection? Describe the role DEAE mediated transfection of mammalian cells. (4,4,2)
- VI. Write short notes on any two of the following:
a) Transgenic mouse
b) Embryo-cryopreservation
c) Uterine-embryo transfer (2x5)
- VII. a) What is transgenesis? Briefly describe various steps and considerations involved in development of a transgenic pig colony producing human hemoglobin.
b) What is non-viral based transfection? Enlist such methods and describe any one of these in detail.
c) What is lipofectamine? (5,4,1)