428 (4)

Exam. Code: 0909
Sub. Code: 6310

2123

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. I which is compulsory and selecting two questions from each Unit.

x-x-x

1. **Attempt the following:-**

i. Enlist the contribution(s) of Rous & Jones, and Hayflick?
ii. What is an episomal vector? Give a suitable example?
iii. What is an histotypic culture?
iv. What is the function of HEPES in the animal cell culture medium?
v. Which antibiotics are added to the cell culture medium to prevent mycoplasma contamination?
vi. What is the function of propidium iodide in FACS analysis?
vii. What is FISH?
viii. How the residual activity of trypsin is inhibited after disaggregation of monolayer cells?
ix. What are major disadvantages of using fetal bovine serum in the animal cell cultures?
x. What is the function of draught tube in Air-lift bioreactor? 1.0 X 10 = 10

UNIT- I

2a. What is a primary cell culture? How a fibroblast cell line can be evolved from mouse embryos?
b. What is fetal bovine serum? Enlist its broader composition, functions and advantages for use in animal cell cultures? 5, 5
3a. What is a feeder layers? Describe its types and major advantages in animal cell culture.
b. What is a 'Continuous Stirred tank Bioreactor'? Draw its schematic diagram, label its parts and describe their functioning in detail. 6, 4
4a. How suspension mammalian cell cultures may be scaled up? Describe the concept of hollow fiber bioreactor in detail.
b. What are microcarriers? Describe their characteristics and major advantages in scale up of animal cell cultures. 5, 5

UNIT - II

5a. What is cryopreservation? Describe various types of cryoprotectants, their advantages, if any, and steps involved in cryopreservation of mammalian cells.
b. What is *in vitro* maturation, co-culture and their advantage(s). 6, 4
6. Write short notes on **any two** of the following;
i. *In vitro* fertilization ii. Uterine embryo transfers iii. Oviduct embryo transfer 5 X 2 = 10
7a. What is a transgene? Describe various steps involved in development of a transgenic mouse colony bearing a gene for human Blood Clotting factor-IX.
b. What are mesenchymal stem cells? Describe their major characteristics and applications in regenerative medicine? 5, 5

x-x-x