

2053
B.E. (Biotechnology) Sixth Semester
BIO-614: Down Stream Processing

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:-

- a) Define crystallization.
- b) What do you understand by reverse osmosis?
- c) Define biosorption.
- d) What is protein precipitation?
- e) Define lyophilization.
- f) Which technique is used to separate charged particles using electric field?
- g) In which type of chromatography, the stationary phase held in narrow tube and the mobile phase is forced through it?
- h) The process of heating a liquid mixture to form vapors and then cooling to get pure component is called
- i) Centrifugation works on..... Law
- j) Density gradient centrifugation is used for purification of..... and

(10x1)

UNIT - I

- II. a) What are different methods of cell disruption? Explain in detail.
b) What do you understand by down streaming? Explain its significance industrial processes.
c) Write a note on liquid-liquid extraction. (4+4+2)

III. Write short note on:-

- a) Aqueous two-phase extraction
- b) Adsorption
- c) Filtration
- d) Density gradient centrifugation.

(4x2½)

- IV. a) Define centrifugation. Write about the principle, type and applications of centrifugation in down streaming.
b) Write in detail about distillation. Explain its principle, procedure and types? (2x5)

UNIT - II

- V. a) Write a note on gas chromatography.
b) Write in detail about electrophoresis, its principle and application. (2x5)

P.T.O.

(2)

- VI. a) Write a note on downstream processing of ethanol.
b) Write in detail about importance of drying in down streaming. (2x5)

VII. Write short notes on:-

- a) HPLC
b) Ultra and nano-filtration
c) Application of crystallization
d) SDS-PAGE electrophoresis (4x2½)

x-x-x