

**B. TECH. (CBCS - 2014 COURSE) SEM - VIII (CHEMICAL  
ENGG.) : SUMMER - 2018**

**SUBJECT: ELECTIVE – IV BIO-SEPARATIONS**

Day: **Saturday**  
Date: **02/06/2018**

**S-2018-4648**

Time: **02.30 PM TO 05.30 PM**  
Max Marks : 60

**N.B. :**

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Assume suitable data, if necessary.

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- Q.1 a)** Write short note on an overview of bio-separation. **(05)**  
**b)** What are different characteristics of biological mixtures? **(05)**  
**OR**
- Q.1 a)** Explain in detail separation of cells and other insolubles from fermented broth. **(05)**  
**b)** Explain in detail physico-chemical basis of bio-separation. **(05)**
- Q.2** Write short note on: **(10)**  
**a)** Cell distribution  
**b)** Adsorption  
**c)** Leaching  
**OR**
- Q.2** Write short note on: **(10)**  
**a)** Liquid-Liquid extraction  
**b)** Sedimentation  
**c)** Ultra filtration
- Q.3** Write short note on: **(10)**  
**a)** Affinity separation  
**b)** Gel chromatographic technique  
**c)** Dialysis  
**OR**
- Q.3** Write short note on: **(10)**  
**a)** Iso-electric focusing  
**b)** HPLC  
**c)** Ultra-centrifugation
- Q.4 a)** Write short note on: **(06)**  
**i)** Addictive crystallization **ii)** Reverse osmosis  
**b)** Explain in detail precipitation method using organic solvent. **(04)**  
**OR**
- Q.4 a)** What is mean by Zone refining? **(03)**  
**b)** How reactive extraction is carried out? **(04)**  
**c)** Write short note on foam separation. **(03)**
- Q.5** Explain any three emerging bio-separation techniques. **(10)**  
**OR**
- Q.5** Write short note on: **(10)**  
**a)** Hybrid-bio-separation  
**b)** Expanded bed chromatography  
**c)** SEP Box
- Q.6** Explain in detail purification of Beer. **(10)**  
**OR**
- Q.6** Explain in detail purification of butanol. **(10)**

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