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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

MID TERM (SUMMER SEMESTER EXAMINATION) June-2018

B.Tech 6th Semester

COURSE CODE: 16B11BT611 MAX. MARKS: 50

COURSE NAME: Downstream Processing

COURSE CREDITS: 4 MAX. TIME: 2 Hrs

***Note:** All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.*

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1. a) What are the advantages of purification of extracellular products over the intracellular products? **[2]**

b) Draw a flow chart representing the process of purification of an intracellular protein. **[2]**

c) Why non-ionic detergents are preferred over the ionic detergents for cell lysis? **[2]**

d) What are the major disadvantages of mechanical methods of cell lysis? **[2]**

e) What are the characteristics of secondary metabolites? **[2]**

2. a) Why the downstream processing is economically integrated component of a bioprocess? **[2]**

b) How the filter aid solve the problem of filter cake's compressibility? **[2]**

c) How will you deal with the following situation for keeping rate of filtration reasonable? **[6]**

i) If the fluid viscosity is higher.

ii) If the particles are compressible in nature

iii) If the slurry contains gelatinous components

3. Differentiate Between **[6]**

a) Solid State and Submerged Fermentation

b) Adsorption and Liquid-liquid Extraction

4. a) Why the salt induced precipitation of proteins is carried out at low temperature? **[2]**

b) Which type of liquid-liquid extraction is efficient: Multistage counter current, Multistage co- current or Single stage? Justify your answer. **[2]**

c) When the feed and solvent are fully miscible, is extraction still possible? Justify your answer. **[2]**

d) A centrifuge rotor is spinning at 20,000 RPM. The top of the cell is 5.5 cm from the rotor's central axis and the bottom of the cell is 9.5 cm from the central axis. What are the g forces on a particle found at the centre of the tube? **[2]**

5. Define the following: **[10]**

a) Salting out **c)** Downstream processing **e)** Adsorbate

b) Raffinate **d)** Filter cake

6. a) Discuss about the various forces acted upon a particle during sedimentation with suitable diagram. **[2]**

b) Define the various 4 Factors which will determine the most appropriate route for recovery and purification under a set of circumstances. **[4]**