

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI  
(END SEMESTER EXAMINATION)**

**CLASS:** M Tech  
**BRANCH:** BIOTECHNOLOGY

**SEMESTER:** II  
**SESSION:** SP/22

**SUBJECT: ADVANCED BIOSEPARATION ENGINEERING (BE 507)**

**TIME: 2 HOURS**

**FULL MARKS: 50**

**INSTRUCTIONS:**

1. The question paper contains 6 questions each of 10 marks.
2. Candidate may attempt any 5 questions of maximum 50 marks.
3. The missing data if any may be assumed suitably.

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|--------|--|-----|
| Q.1(a) | Provide the significance of broth processing?  | [2] |
| Q.1(b) | Investigate the process of filtration employing continuous mode?   | [3] |
| Q.1(c) | Analyze the different aspects of enzymatic methods of cell disruption?   | [5] |
| Q.2(a) | Describe the principle of ATPS?  | [2] |
| Q.2(b) | Calculate the angular velocity in radian per second to have pellets at 50,000rpm?  | [3] |
| Q.2(c) | Explain the mass balance of batch adsorption process?  | [5] |
| Q.3(a) | Evaluate the different aspects of protein precipitation?   | [2] |
| Q.3(b) | Discuss the basic features of column chromatography?   | [3] |
| Q.3(c) | Examine the different stages of Affinity chromatography?   | [5] |
| Q.4(a) | Elucidate the importance of gels employed in separation of biomolecules?   | [2] |
| Q.4(b) | Analyze the significance of filter modules employed filtering process?   | [3] |
| Q.4(c) | Investigate the significance of membrane-based separation? How to resolve the fouling of membrane?   | [5] |
| Q.5(a) | Calculate the value of cephalosporin adsorbed per unit weight of activated carbon which adsorbs 5625 mol/cm <sup>3</sup> by the mechanism of Langmuir adsorption isotherm with constant k as 2 mol/l and concentration of solute in solution as 25 mol/cm <sup>3</sup> ? | [2] |
| Q.5(b) | Examine different aspects required in formulation of a purified product?   | [3] |
| Q.5(b) | Analyse different variables used in the process of drying of biological sample?  | [5] |
| Q.6(a) | What do you mean by supersaturation?   | [2] |
| Q.6(b) | Elucidate the significance of liquid liquid extraction?  | [3] |
| Q.6(c) | Evaluate the different types of resistances occur during filtration process?   | [5] |

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