

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

MID SEMESTER EXAMINATION-2015

B.Tech VI<sup>th</sup> Semester

COURSE CODE: 10B11BT614

MAX. MARKS: 30

COURSE NAME: Fermentation Technology & Downstream Processing

COURSE CREDITS: 04

MAX. TIME: 2 HRS

Note: All questions are compulsory.

Section A

(Marks: 6)

1. Differentiate between solid state and submerged fermentation.
2. What is turbidostat?
3. What do you understand by concerted feedback control?
4. Microbial oxidation of Hydrocarbons is a highly aerobic and exothermic process thus production fermentar should have a very high  $O_2$  transfer capacity with excellent cooling facilities. Which kind of a fermenter will you use and why?
5. How the presence of fast metabolized sugar in fermentation medium affects the productivity of secondary metabolites?
6. What are the different problems associated with the plant cell culture?

Section B

(Marks: 9)

1. Give the structural details and application of fluidized bed reactor. How it is different from packed bed reactor? [3]
2. Which factors are considered during industrial media preparation? [3]
3. a) Why the preservation of industrially important culture is important? [1]  
b) *E. coli* is cultivated in continuous culture under aerobic conditions with glucose limitation. When the system is operated at  $D = 0.2 \text{ hr}^{-1}$ , determine the effluent glucose and biomass concentrations assuming Monod kinetics ( $S_0 = 5 \text{ g/l}$ ,  $m_m = 0.25 \text{ hr}^{-1}$ ,  $K_S = 100 \text{ mg/L}$ ,  $Y_{x/s} = 0.4 \text{ g/g}$ ). [2]

Section C

(Marks: 15)

1. Why strain improvement is important? Explain the strain modification strategies for a protein production of which synthesis is regulated by an enzyme which is allosterically inhibited by its own final protein product (desired) in higher concentration. [2+3]
2. a) What are the advantages of Rotating drum reactor for the plant cell cultivation? [2]  
b) What are the major common features considerations in animal cell culture? [3]
3. a) What should be the different properties of an ideal antifoam agent? Why foam control is important in a fermentation process? [2+1]  
b) What are the major advantages of air-lift reactors with external risers as compared to those with internal risers? [2]

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