

**D 50673**

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Name.....

Reg. No.....

**FIFTH SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2018**

(CUCBCSS—UG)

Biotechnology

BTY 5B 09—BIOPROCESS TECHNOLOGY

Time : Three Hours

Maximum : 80 Marks

**Section A**

*Answer any two out of four questions in about 1,500 words.*

*Each question carries 10 marks.*

1. Give the flow chart of a typical bioprocess and explain the importance of various stages in it.
2. Discuss the various methods of cell disruption .Comment on the merits and demerits of each method.
3. Explain the composition of a typical fermentation medium. Explain the strategies followed in the optimisation of fermentation media.
4. Discuss the merits and demerits of cell immobilisation. Explain the various methods of cell immobilisation with specific examples.

(2 × 10 = 20 marks)

**Section B**

*Answer any seven out of fourteen questions in about 750 words.*

*Each question carries 5 marks.*

5. Discuss the application of protoplast technique in the improvement of industrially important micro-organisms.
6. What are the methods of industrial sterilisation ? Comment on the application of each method.
7. Discuss the importance of various ingredients in the medium for animal culturing.
8. What is a batch culture ? Discuss the kinetics involved in batch culture.
9. Discuss the advantages and disadvantages of packed bed reactor and fluidised bed reactor.
10. Explain the online and offline instrumentation of a typical bioreactor.
11. What is Gel filtration ? Discuss the principle involved in this technique. Comment on the applications of gel filtration.
12. Comment on the media composition and strategies of downstream processing in citric acid production.

**Turn over**

13. Schematically represent a CSTR.
14. Comment on the various steps in the fermentative production of intracellular bacterial enzymes.
15. Discuss the various methods of preservation industrially important anti microbial cultures.
16. What are primary screening and secondary screening in the isolation of industrial micro-organisms ? Discuss the different methods of primary and secondary screening.
17. Discuss the different methods of bringing control in the temperature, pH, dissolved oxygen and RPM in a typical fermenter
18. Discuss the principle involved in the precipitation and crystallisation of enzymes produced through bioprocess.

(7 × 5 = 35 marks)

### Section C

*Answer all questions in about 300 words.*

*Each question carries 3 marks.*

19. What are antifoam agents ? What are the essential characteristics of an ideal antifoam agent ? Give examples ?
20. What is lyophilisation ? Discuss how lyophilisation is useful in the preservation of industrially important cultures.
21. What is Yield coefficient in batch kinetics ? Specify how it is estimated at different levels.
22. Discuss the application of immobilised enzymes with specific examples.
23. What is single cell protein ? Comment on its production strategies.

(5 × 3 = 15 marks)

### Section D

*Answer all questions in about 200 words.*

*Each question carries 2 marks.*

24. Differentiate the principle involved in the process of entrapment and encapsulation in cell immobilization.
25. Comment on the composition of the medium for penicillin production
26. What is elution volume and water regain in gel filtration?
27. Comment on the relation between the specific growth rate and doubling time of a typical batch culture.
28. What are baffles ? Comment on its function

(5 × 2 = 10 marks)