

M. Sc. DEGREE EXAMINATION, NOVEMBER 2007
BIOTECHNOLOGY
THIRD SEMESTER

COURSE : CORE
PAPER : BIOPROCESS TECHNOLOGY
TIME : 3 HOURS

MAX. MARKS: 100

SECTION – A

Answer all questions:

20 x 1 = 20

1. What is yield coefficient?
2. What are antifoams? Explain their function with examples.
3. What are the different factors in medium affecting oxygen availability?
4. Define Rheology.
5. What are the factors influencing the choice of carbon source?
6. Define dilution rate.
7. Define Residence time distribution.
8. What is a rotameter?
9. Define Dead band.
10. What are controllers? Give the types of control.
11. Define respiratory quotient.
12. Define metabolic oxygen utilization.
13. Define Reynolds number, Prandtl number, Schmidt number.
14. Define Oxygen transfer coefficient. Give its significance.
15. What is Gas holdup and Diffusivity coefficient?
16. Define effectiveness factor in mass transfer operations.
17. What is Scale up and Scale down in fermentation?
18. What is the principle of centrifugation? List the types of centrifuges used in Bioprocess.
19. What is Partition coefficient?
20. What is supercritical fluid extraction?

SECTION – B**Answer any four questions in about 600 words :****4 x 10 = 40**

21. What is metabolic engineering? Discuss with specific examples.
22. What are the steps involved in inoculum development?
23. Write in detail the production of citric acid in a fermenter.
24. Write a short note on computer aided control in bioprocess.
25. Explain Podbielniak centrifugal extractor used in liquid-liquid extraction.
26. Discuss Thermal death kinetics.

SECTION – C**Answer any two questions in about 1500 words:****2 x 20 = 40**

27. Write a detailed note on the kinetics of cell growth, substrate utilization and product formation.
28. Explain oxygen transfer coefficient. What are the parameters affecting oxygen transfer in a fermenter? How will you measure $K_L a$?
29. Write short notes on the following downstream processes:
 - a. HPLC
 - b. Supercritical fluid extraction
 - c. Ultrafiltration
 - d. Crystallization
30. Explain
 - a. Fluid rheology
 - b. Anaerobic systems in bioprocess
