Register Number: ……..

B.TECH DEGREE EXAMINATIONS: APRIL/MAY 2014

(Regulation 2009)

Third Semester

BIOTECHNOLOGY

BTY 103: Basic Industrial Biotechnology

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Which one filter is economical for sterilization of air for fermentation process?
   a) Depth b) Membrane
   c) Filter paper d) Cheese cloth
2. Free-flow of water is absent in …… fermentation
   a) Submerged b) Solid-state
   c) Both submerged & solid-state d) None
3. Colored organic impurities during purification of products are removed by
   a) Ion-exchange chromatography b) Activated carbon
   c) Gel-filtration chromatography d) Affinity chromatography
4. Penicillin is an example for …… metabolite
   a) Primary b) Secondary
   c) Both primary and secondary d) None
5. Citric acid is used as …… in food industries
   a) Preservative b) Sugar
   c) Nitrogen source d) Mineral source
6. Molasses is a rich source of …… for fermentations
   a) Carbon b) Nitrogen
   c) Growth factors d) Precursors
7. Which of the following microbe can tolerate more alcohol in fermented broth?
   a) *Kluvyromyces sp.* *b) Zymomonas mobilis*
   c) *Saccharomyces cerevisiae* *d) Candida utilis*
8. Xanthan gum is used as …… . in food industries
   a) Thickener b) Protein
   c) Preservative d) Fat

9. Saffron is obtained from …… source
   a) Animal b) Plant
   c) Algal d) Fungal
10. Which of the following cells requires lowest agitation during fermentation?
   a) Bacterial b) Fungal
   c) Animal d) Plant

PART B (10 x 2 = 20 Marks)

11. Differentiate batch fermentation with that of fed-batch fermentation
12. List out the advantages of simple or defined media
13. Draw and label the parts of stirred tank bioreactor
14. Define primary metabolite with suitable examples
15. Why is steady-state achieved only in continuous fermentation?
16. Write structure of penicillin and lactic acid
17. Why is nisin preferred in food industries to chemical preservatives?
18. Name the enzymes widely used in pharmaceutical industries
19. What are differences between vaccine and antibiotics?
20. What is suspension culture in plant tissue culture?

PART C (5 x 14 = 70 Marks)

21. a) (i) Write short notes on physical methods used for immobilization of enzymes/cells (7)
    (ii) List out the functions of pre-filter, HEPA filter, baffle, rotameter, and agitator in fermenters (7)

(OR)

    b) (i) Discuss in detail on microbial strain improvement using any one of the recombinant DNA technology method (7)
    (ii) What are the advantages and disadvantages of solid-state fermentation? (7)

22. a) (i) Describe the commercial production of acetic acid with flow chart (7)
    (ii) How is glutamic acid produced in industries? (7)

(OR)

    b) (i) Elaborate on industrial production of ethanol with flow chart (7)
    (ii) Write the importance of biosafety (7)

23. a) (i) Describe the production of streptomycin (7)

(ii) Write in detail on commercial production of vitamin B_{12} (7)

(OR)

b) Discuss the usage of microbial / plant cells for transformation of chemicals to value-added products

24. a) (i) What are the enzymes used in food industries? Mention their specific applications (7)

(ii) How is lipase produced in industries with a neat flow chart? (7)

(OR)

b) (i) Write different unit operations in cheese manufacture (10)

(ii) List out the applications of PHA (4)

25. a) What are the steps involved in the production of any one of the recombinant protein having therapeutic applications

(OR)

b) (i) Name the commercially available animal cell culture products along with their applications (7)

(ii) List out the products obtained through plant tissue culture (7)

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