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53 (FPT 712) FRTC

2018

**FERMENTATION TECHNOLOGY**

Paper : FPT 712

Full Marks : 100

Time : Three hours

**The figures in the margin indicate full marks for the questions.**

**Answer any five questions from seven.**

1. Define the following : (**any five**)  $4 \times 5 = 20$ 
  - (a) Stoichiometry
  - (b) Respiratory Quotient
  - (c) Theoretical oxygen demand
  - (d) Del factor (sterilization job)
  - (e) Maintenance coefficient of microbial cell
  - (f) Dilution rate in CSTR
  - (g) Effectiveness factor of immobilized enzyme.

Contd.

2. Draw microbial cell growth curve and discuss briefly.

Write microbial cell growth rate equation. What is specific growth rate and doubling time ? What is the unit of specific growth rate ?

$$10+4+5+1=20$$

3. Briefly write about batch, continuous and fed batch mode of culture, specifically mentioning their individual operational strategy. 20

4. Write short notes on : **(any two)**

$$10+10=20$$

- (a) Requirement of agitation and aeration in fermentation.
- (b) Immobilized enzyme in Plug Flow Reactor.
- (c) Dynamic method for estimating  $K_L a$  value (volumetric oxygen transfer coefficient).
5. (a) Write about the following : **(any two)**

$$10+10=20$$

- (i) Monod equation
- (ii) Michaelis-Menten equation (with assumptions)
- (iii) Luedeking and Piret equation.

6. Write about fermentative productions of fermented food like fermented dairy product, fermented vegetable, soya sauce etc. 20
  7. Write about fermentative production of a commercially important food enzyme and its purification steps from the fermentation broth. 20
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7. Write about fermentative production of commercially important food enzyme and its purification steps from the fermentation broth. - 20

8. Write about the importance of fermentation in the production of antibiotics. - 20

9. Write about the role of microorganisms in the production of organic acids. - 20

10. Write about the role of microorganisms in the production of vitamins. - 20

11. Write about the role of microorganisms in the production of enzymes. - 20

12. Write about the role of microorganisms in the production of pigments. - 20

13. Write about the role of microorganisms in the production of bioactive compounds. - 20

14. Write about the role of microorganisms in the production of biodegradable polymers. - 20

15. Write about the role of microorganisms in the production of biofuels. - 20

16. Write about the role of microorganisms in the production of bioplastics. - 20