



BTS 171 (J)

***B.Tech. Degree V Semester (Supplementary)
Examination in Safety and Fire Engineering
June 2002***

**SE 504 CHEMICAL ENGINEERING III
(1995 Admissions)**

Time: 3 Hours

Maximum Marks: 100

MODULE - I

- I. (a) What is Biosphere? Explain in detail the hydrologic and nutrient cycles which occur in Biosphere. (15)
- (b) What are the consequences of population-growth on degradation of environment? (5)
- OR**
- II. (a) Define adiabatic lapse rate. Derive the expression for adiabatic lapse rate assuming ideal gas law. (10)
- (b) Explain the following terms as applied to pollutants dispersion in atmosphere:
- | | | |
|----------------|--------------|------|
| (i) Lofting | (ii) Tanning | |
| (iii) Trapping | (iv) Coning | (10) |

MODULE - II

- III. (a) What are the various biological treatment methods for industrial wastes? Explain any two processes in detail. (15)
- (b) Give the classification of solid wastes. (5)

OR

(Turn over)

- IV. (a) Explain the estimation of B.O.D and C.O.D in waste water. Discuss their significances in waste water treatment methods. (10)
- (b) Discuss the treatment and disposal methods for hospital wastes and domestic garbage. (10)

MODULE - III

- V (a) With a neat sketch of sampling train, explain the necessary precautions for gaseous and particulate sampling. (10)
- (b) Discuss the pollution problems from automobile exhaust. (10)
- OR**
- VI (a) Discuss any one method of estimation of oxides of Nitrogen from ambient air. (10)
- (b) What are common air pollutants generated from paper and pulp industry? Suggest the various options available for environmental management. (10)

MODULE - IV

- VII Describe with a neat flow sheet the manufacture of Soda Ash by Solvay process. Discuss the major engineering problems encountered. (20)
- OR**
- VIII (a) Discuss briefly on hydrogenation of oils. (10)
- (b) Explain the different cracking processes in refinery operations. (10)

Contd.....3.

MODULE - V

- IX. (a) With a suitable example, explain the electrochemical mechanism of corrosion. (10)
- (b) How do you protect a steel tank containing sulfuric acid from corrosion? Explain. (10)
- OR**
- X. Discuss the applications of the following materials of construction in chemical industries:
- (i) Copper and alloys
 - (ii) Lead and alloys
 - (iii) Plastics and rubber
 - (iv) Carbon and low alloy steel. (20)
