M.Sc. (Part–II) Semester–III (CBCS) Examination
CHEMISTRY (OLD)
(Industrial Chemistry–I)
Paper–XI
(Heat Transfer, Unit Operations and Materials Balance)

Time : Three Hours] [Maximum Marks : 80

Note :— All questions are compulsory.

1. (a) Explain thermal conduction, convection and radiation. 5
   (b) Derive equation for Fourier's Law. 6
   (c) Discuss the double pipe heat exchanger. 5

OR

   (p) Explain construction and working of reciprocating pumps. 5
   (q) Explain the importance of Fan and Blower in chemical plant. 6
   (r) Write a note on Reynold's number. 5

2. (a) Explain construction and working of fluid bed dryer. 6
   (b) Discuss drying curve under constant drying time. 5
   (c) Explain construction and working of packed column for gas absorption. 5

OR

   (p) What is filtration ? Explain filter media. 6
   (q) Discuss multiple effect evaporator. 5
   (r) Explain relative merits and demerits of plate and packed tower. 5

3. (a) Give an account on :
      (i) Limiting component
      (ii) Excess component. 6
   (b) Discuss crystallization operation with block diagram and give its material balance equations. 5
   (c) Give an account on purge operation. 5

OR

   (p) What is distillation ? Discuss with block diagram and give the material balance equations. 5
   (q) Discuss :
      (i) Conversion
      (ii) Selectivity 6
   (r) What is gas absorption ? Give the material balance equation with diagram. 5

4. (a) Discuss the poisoning of catalyst and its activation. 5

(b) Explain the use of palladium in catalysis. 6

(c) Give the classification of catalyst. 5

OR

(p) Explain the basic principle of catalysis. 5

(q) Write an explanatory note on phase transfer catalysis. 6

(r) Discuss the catalyst preparation. 5

5. (a) Discuss the prevention method of corrosion. 5

(b) Explain the importance of aluminium and its alloy as a material of construction. 6

(c) Explain structural corrosion. 5

OR

(p) Give the importance of polymeric material as a material of construction. 5

(q) Explain the importance of Titanium and its alloy as a material of construction. 6

(r) Explain intergranular corrosion. 5