

**CHEMICAL PROCESS TECHNOLOGY
(CHE2202)**

Time Allotted : 2½ hrs

Full Marks : 60

Figures out of the right margin indicate full marks.

*Candidates are required to answer Group A and
any 4 (four) from Group B to E, taking one from each group.*

Candidates are required to give answer in their own words as far as practicable.

Group – A

1. Answer any twelve:

12 × 1 = 12

Choose the correct alternative for the following

- (i) Which chemicals are added as corrosion inhibitors in Solvay method?
(a) Chloride and iodine (b) Cyanides and sulfides
(c) Cyanides and Iron (d) Sulfides and chloride.
- (ii) Catalyst used in the sulphuric acid production unit is
(a) Platinum – rhodium (b) Aluminium and zinc oxide
(c) Vanadium pentoxide (d) Lime
- (iii) Industrially viable catalyst used for the production of HNO₃ is
(a) Vanadium pentoxide (b) Cobalt molybdenum
(c) Hydrogen peroxide (d) Platinum/rhodium alloy
- (iv) The fraction of crude oil used in petrol is
(a) Gas oil (b) Light gasoline
(c) Fuel oil (d) Kerosene
- (v) Straight run gasoline in the fractional column is obtained at what temperature?
(a) 135°C to 170°C (b) 70° to 120°c
(c) 8°C to 25°C (d) 130°C to 150°C
- (vi) Dowtherm is used during ethylene oxide production
(a) To maintain the reactor pressure
(b) To maintain the reactor temperature
(c) To maintain the higher conversion
(d) None of these
- (vii) The catalyst of fluid catalytic cracking reaction is
(a) Zeolite (b) Ziggler Nutta
(c) Ferric oxide (d) Charcoal

- (viii) Bitumen is used for the production of
 (a) Blast furnace coke (b) Coke
 (c) Paving grade coal (d) Metallurgical coke
- (ix) The raw materials of portland pozolana cement are
 (a) Calcium and silica (b) Calcium and alumina
 (c) Silica and fly ash (d) Calcium and fly ash
- (x) Which of the following cooling towers possess maximum heat transfer from air to water?
 (a) Natural Draft (b) Mechanical Draft
 (c) Natural and Mechanical Draft (d) Atmospheric Draft.

Fill in the blanks with the correct word

- (xi) To avoid iron contamination during chlorine production evaporator should be lined with _____.
- (xii) _____ is not an important refinery process for upgrading the quality of lubricating oil.
- (xiii) _____ is circulated in quench tower to reduce the temperature of crude butadiene.
- (xiv) The modulus of elasticity of ceramic has a range of _____.
- (xv) The oil colour is removed by treating with _____ during hydrogenation of vegetable oil.

Group - B

2. (a) Describe the manufacturing process of chlorine production in mercury cell with a help of a neat flow sheet. [[CO1,CO2](Analyse/HOCQ)]
 (b) Discuss the advantages and disadvantages of mercury cell process. [[CO4](Remember/LOCQ)]
8 + 4 = 12
3. (a) Briefly explain the sulphur dioxide conversion into sulphur trioxide in a multistage catalytic converter with the help of a neat diagram. [[CO4](Analyse/HOCQ)]
 (b) Discuss the major engineering problems associated with the sulphuric acid production unit. [[CO5](Understand/LOCQ)]
 (c) Discuss the rate of contact reaction of sulphuric acid production unit. [[CO5](Apply/IOCQ)]
6 + 4 + 2 = 12

Group - C

4. (a) Explain the manufacturing process of urea, including the raw materials, process flow sheet, and major equipment details. [[CO2](Apply/IOCQ)]
 (d) Explain the process of Biuret formation and its disadvantages. [[CO2, CO3](Apply/IOCQ)]
8 + 4 = 12

5. (a) State the difference between SSP, TSP, and DAP. [[C02)(Analyse/HOCQ]]
 (b) Discuss the benefit and problem associated with Nitrogen fertilizers. [[C03)(Remember/LOCQ]]
6 + 6 = 12

Group - D

6. (a) Briefly discuss the manufacturing process of ethylene oxide production with the help of a neat flow sheet. [[C03)(Analyse/HOCQ]]
 (b) State the application properties of ethanol monomer and its chemical formula. [[C03)(Remember/LOCQ]]
8 + 4 = 12
7. (a) Write the reactions occurring during isopropanol production. [[C03)(Analyse/HOCQ]]
 (b) Explain the manufacturing process of acrylonitrile production with the help of a neat flow sheet. [[C03)(Remember/LOCQ]]
4 + 8 = 12

Group - E

8. (a) Discuss various steps of hydrogenation of oil. [[C04)(Analyse/IOCQ]]
 (b) Explain the enzymatic interesterification process with the help of a diagram. Give an example of transesterification process. [[C04)(Remember/LOCQ]]
6 + (4 + 2) = 12
9. (a) Describe the properties of refractories and its application. [[C03)(Analyse/HOCQ]]
 (b) Write a short notes on sintering and fused in refractories. What type of material is used for the insulation in refractories? [[C04)(Remember/LOCQ]]
6 + (4 + 2) = 12

Cognition Level	LOCQ	IOCQ	HOCQ
Percentage distribution	39.58	20.84	39.58

