

# 17651

**15162**

**3 Hours / 100 Marks**

Seat No.

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- Instructions* – (1) All Questions are *Compulsory*.  
(2) Answer each next main Question on a new page.  
(3) Illustrate your answers with neat sketches wherever necessary.  
(4) Figures to the right indicate full marks.  
(5) Assume suitable data, if necessary.

**Marks**

- 1. Attempt any FIVE of the following: 20**
- List the name of at least six major refineries in India. Which is the largest refinery among them?
  - What is OPEC. List the names of four oil producing countries in the world.
  - Explain desalting of crude.
  - Name various fractions obtained from petroleum distillation. Write their approximate boiling range.
  - Draw flow diagram of ethylene oxide manufacture.
  - What is denatured alcohol? Name two denaturants used.
  - Crude oil is often called black gold. Explain why?
- 2. Attempt any FOUR of the following: 16**
- Describe any one alkylation process with reactions.
  - What are the characteristics of waste water produced in petrochemical plant.
  - Give the names of two types of cracking processes. State the basic difference between them.

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- d) What do you mean by LEL and HEL? What is ignition temperature?
- e) List out two chemical derived from  $C_1$  and  $C_2$  Hydrocarbons.
- f) What is polymerization? State the three methods of polymerization.

**3. Attempt any FOUR of the following: 16**

- a) Define:
  - (i) Flash point
  - (ii) Drop point
  - (iii) Pour point
  - (iv) Cloud point
- b) Describe process of butadiene manufacture. Draw a flow diagram for the same.
- c) Draw the flowsheet for manufacture of formaldehyde.
- d) What are the different factors affecting the price of crude oil?
- e) Why distillation operation is considered to be major unit operation in oil refining process?
- f) List out two chemical derived from  $C_3$  and  $C_4$  hydrocarbons with their uses.

**4. Attempt any FOUR of the following: 16**

- a) How crude oil is separated by fractional distillation?
- b) Draw a flow diagram for the manufacture of MTBE.
- c) Explain Udex process for recovery of BTX from reformat gasoline.
- d) Describe the working of vacuum distillation unit?
- e) Explain steps in waste water treatment in petro chemical industry.
- f) What is the importance of vacuum distillation in refinery operations.

- 5. Attempt any FOUR of the following:** **16**
- a) Explain estrification process in refineries.
  - b) Explain reforming with neat flow sheet.
  - c) Explain the manufacturing of styrene with neat flow sheet.
  - d) Explain any one coking process.
  - e) Explain thermal cracking process.
  - f) State the constituents of crude oil? List the names of four unit operation involved in refining process.
- 6. Attempt any FOUR of the following:** **16**
- a) What is difference between petroleum refinery and petrochemical industry?
  - b) List various types of refineries
  - c) What is isomerization? Explain with flow sheet.
  - d) Define:
    - (i) Octane number
    - (ii) Cetane number
  - e) Draw the flow sheet for manufacture of ethanol.
  - f) Draw the flow sheet for the manufacture of propylene oxide.
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