BACHELOR OF CHEMICAL ENGINEERING EXAMINATION, 2022

(THIRD YEAR SECOND SEMESTER)

CHEMICAL TECHNOLOGY - II

Time: Three hours | Full Marks: 100
(50 marks for each part)

Use Separate Answer scripts for each part

Part – I

Answer THREE Questions (All questions do not carry equal marks)

1.a) Explosive concerns with compressed natural gas used in vehicles are almost non-existent — why ?
b) Refinery gases are dried in the first step of LPG preparation — why ?
c) What is wild gasoline ? Why it has to be stabilized ?
d) The length of the flare indicates the health of the refinery — comment.
e) What is steam tracing ? Where and why is it needed ?
f) Refinery tube-still heaters are operated under balanced draft mode — why ?
g) What are the temperature and pressure specifications in the electrostatic desalting of crude oil and why ?
h) The furnace stack-top temperature is never allowed to fall below the dew-point of the flue gas — why ?
i) Corrosion in atmospheric distillation unit is mainly observed in the overhead section, why and what is the remedy ?
j) Catalytic reformer unit cannot be a fluidized-bed reactor — why ? 10×2

2. With the help of a neat flowsheet discuss the fat splitting process to produce the final products namely soap and pure white glycerine. 15

3. With the help of a neat flowsheet discuss how cane-sugar is produced from sugar-cane. 15

4. Briefly discuss all the steps involved in the production of leather from animal skins or hides. 15

B.E. CHEMICAL ENGINEERING THIRD YEAR SECOND SEMESTER EXAMINATION 2022

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Part - II
50 MARKS

Answer any *five* questions

1. Describe the production of vinyl acetate monomer using a schematic diagram mentioning the reactions, heterogeneous catalysts used and operating conditions maintained. Mention the drawbacks of homogeneous catalytic process in this context. **[10]**

2. Briefly describe the production of Formaldehyde through heterogeneous catalytic oxidation of Methanol mentioning the process conditions using a schematic diagram. **[10]**

3. Elucidate the production of (i) ethyl benzene and (ii) cumene through alkylation of benzene with ethylene and propylene respectively illustrating catalyst and typical process conditions(flow diagram not required). (iii) What is the role of steam in dehydrogenation of ethyl benzene? **[(4+4)+2]**

4. Briefly describe the thermal cracking of naphtha using a simplified flow diagram mentioning the salient operating conditions. Define KSF and show its effects on product yields. **[8+2]**

5. (i) Briefly describe the extractive distillation method for separation of aromatics from hydrocarbon feedstock mentioning the salient features of the solvent.

(ii) Briefly describe the separation of BTX from crude BTX using a schematic diagram. **[5+5]**

6.(i) Elucidate "Auto-acceleration" (Gel Effect) behaviour in free radical bulk/mass polymerization systems.
6.(ii) What do you mean by Zeigler Natta catalyst ? Briefly describe Polyethylene Production through Ziegler Process mentioning the process conditions using a schematic diagram. **[2+(2+6)]**

7. Briefly describe the production of Keryl –Benzene –Sulphonate from Kerosene range paraffins using a schematic diagram. **[10]**

8. Briefly describe the production of Styrene-Butadiene rubber (SBR) using emulsion polymerization method from the corresponding monomers mentioning the process conditions using a schematic diagram. **[10]**