

Time - 3 hrs

Marks -80

N.B -

Question no 1 is compulsory.
Solve any three questions from remaining five questions.
Draw flow sheets and diagrams wherever necessary.

- Q.1 a) Write short note on principles used in chemical process industry. 4
- b) Differentiate between HDPE, LDPE and LLDPE. 4
- c) Describe diaphragm cell used for Caustic soda manufacture. 4
- d) Write short note on manufacture of Biodiesel 4
- e) Write short note on various treatments of crude oil to maximize gasoline 4
- Q.2 a) Describe DCDA process for sulfuric acid manufacture from elemental sulphur with reference to :- 14
- i) Why multistage reactor used?
 - ii) Why interpass absorption done?
 - iii) How energy conservation achieved?
 - iv) What are the typical process conditions?
 - v) What is the typical SO_2 conversion achieved and composition of tail gas?
- b) Describe manufacture of Acetic acid by methanol carbonylation 6
- Q.3 a) Explain manufacture of phenol from cumene. 10
- b) Describe with process flow diagram manufacture of single and triple superphosphate. 10
- Q.4 a) Describe the manufacturing process used for synthesis of ethylene by naphtha cracking. 10
- b) Explain with process flow diagram the manufacture of soda ash with detail working of carbonating tower. 10

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- Q.5 a) Describe manufacturing process of styrene starting from ethyl benzene. What are the major engineering problems associated with the process? How will you produce 99.9% pure styrene. What is the role of steam? 12
- b) Describe the manufacture of PTA. 8
- Q.6 a) Describe manufacture of Nylon 66 in details. 10
- b) Write short note on (any two) 10
- i) Ammonia convertor
 - ii) An overview of Vegetable oil industry in India
 - iii) Major engineering problems in manufacture of Urea
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