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Total number of pages : 02

B.Tech
PCE3I102

3rd Semester Regular / Back Examination 2018–19

CHEMICAL TECHNOLOGY

BRANCH : CHEM

Time : 3 Hours

Max Marks : 100

Q.CODE : E720

Answer Question No.1 (Part-I) which is compulsory, any EIGHT from Part-II, and any TWO from Part-III.

The figures in the right-hand margin indicate marks.

Answer all parts of a question at a place.

Part – I

Short Answer Type Questions (Answer All TEN)

Q1 Answer the following questions : (2 x 10)

- Mention the advantages and disadvantages of Diaphragm process for caustic soda production.
- List the desirable properties of solvent used in solvent-extraction of oil from oilseed.
- With the help of chemical reaction, explain the products obtained from hydrogenation of vegetable oils. How does the catalyst play an important role?
- What is Saponification? Explain with chemical reactions.
- Why is lignin extracted from pulp?
- What is black liquor? What are the chemicals present in it?
- How dyes impart color?
- Define starch and also write the chemical structures of starch. Enumerate its applications.
- What are molasses and bagasse? Write their uses.
- Write properties and uses of Phenol formaldehyde.

Part – II

Focused-Short Answer Type Questions (Answer Any Eight out of Twelve)

Q2 Answer the following questions : (6 x 8)

- Write short notes on various methods for production of hydrochloric acid.
- With a neat flow diagram describe in detail about mechanical expeller process of extraction of vegetable oil from oil seed along with its purification.
- How chemical is recovered in pulp and paper industries? Explain with a neat flow sheet.
- What are the various methods for the production of glycerin? Discuss their consumption pattern and end uses.
- In what way detergents are superior to soaps? Describe any one method of manufacture of detergent.
- Differentiate between Sulphate and Sulphite pulping processes for pulp manufacture. List the chemicals required for these processes.
- Give constituents of white, black, blue, and red pigments. How are titanium dioxide pigments made?

- h) Explain inversion of sugar. Describe extraction of sugarcane for production of gur.
- i) Write method of production of di-aldehyde starch and starch phosphate with chemical reactions.
- j) Describe manufacture of PVC by emulsion polymerization with a neat flow diagram.
- k) Discuss the manufacture of Nylon 6 with chemical reactions involved during the process. Write properties and uses of nylon 6.
- l) Explain the manufacturing processes of polypropylene with chemical reactions.

Part – III

Long Answer Type Questions (Answer Any Two out of Four)

Q3 Explain with process flow diagram, the manufacture of soda ash by “Solvay Process” with detail constructional and operational features of carbonating tower. Is Dual process superior to Solvay process? Explain. **(16)**

Q4 Describe the Contact process for sulfuric acid manufacture from elemental sulphur with reference to: **(16)**

- Why are multistage reactors used?
- Why interpass absorption column is used?
- How energy conservation is achieved?
- What are typical process conditions?
- How conversion of SO_2 to SO_3 in manufacture of sulfuric acid is affected by temperature and pressure?

Q5 List the raw materials for the manufacture of paper. How is paper manufactured from pulp? With a neat flow sheet, describe the various stages involved in the manufacture of paper. Also discuss the major engineering problems involved in pulp industries. **(16)**

Q6 What is fermentation? Discuss the manufacture of ethanol from molasses by fermentation. Mention the uses of byproducts obtained. Discuss in detail about the major engineering problems of ethyl alcohol industries. **(16)**