Registration No.										

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B.TECH
PCE3I102

3rd Semester Regular Examination 2016 - 17
CHEMICAL TECHNOLOGY
BRANCH : Chemical
Time : 3 Hours
Max Marks : 100
Question Code : Y528

Answer Part-A which is compulsory and any four from Part-B.

The figures in the right-hand margin indicate marks.
Answer all parts of a question at a place.

Part – A (Answer all the questions)

1. Answer the following questions : (multiple type) **2 x 10**

(a) The principal raw materials for the production of chlorine gas by mercury electrolytic cell are:
- i. saturated NaCl solution only
- ii. saturated NaCl solution with solid NaCl make-up
- iii. solid NaCl only
- iv. 90-92 % NaCl solution

(b) Solvay process for the manufacture of soda ash
- i. can use low grade brine
- ii. requires less electric power than modified Solvay process
- iii. does not require NH_3 plant investment
- iv. all of the above

(c) Slaked lime is produced by
- i. hydrogenation of quicklime
- ii. hydration of quicklime
- iii. dehydration of quicklime
- iv. dehydrogenation of quicklime

(d) Contact process for the manufacture of sulphuric acid yields
- i. 80% H_2SO_4 only
- ii. 98% H_2SO_4 and higher
- iii. 95% H_2SO_4 only
- iv. 90% H_2SO_4 only

(e) Tallow refers to
- i. oil of animal origin
- ii. oil derived from soyabean
- iii. oil derived from groundnut
- iv. a mixture of vegetable oils

(f) Hydrogenation of edible oils

i. increases their melting point
ii. decreases their melting point
iii. is an endothermic reaction
iv. is an autocatalytic reaction

(g) Fourdrinier machine is used
i. in the manufacture of paper
ii. in the manufacture of synthetic detergent
iii. in the manufacture of sugar
iv. in the manufacture of dyes

(h) Gluten is
i. protein
ii. fat
iii. an amino acid
iv. carbohydrate

(i) For the manufacture of ethanol by fermentation of molasses, the temperature is kept at _____ ^{0}C.
i. 120-130
ii. 60-65
iii. 20-30
iv. 175-185

(j) Which of the following is a disaccharide ?
i. Glucose
ii. Cellulose
iii. Starch
iv. Sucrose

2. Answer the following questions : 2 x 10

(a) Write the effect of temperature on the conversion of SO_2 to SO_3 during the production of sulphuric acid.

(b) Which catalyst is used for hydrogenation of oil? Write down the chemical reactions involved in the preparation of this catalyst.

(c) Name different types of detergents. Mention the various uses of soap and detergents.

(d) Why bleaching of pulp is required? What are the traditional bleaching agents used for this ?

(e) Classify the paper products according to the use of requirement.

(f) Why beating is required in the manufacture of paper?

(g) Classify the dyes.

(h) What are the by-products of sugar industries? Write their uses.

(i) Write down different methods for production of polyethylene.

(j) Write the uses of phenol formaldehyde resin.

Part – B (Answer any four questions)

3. (a) Describe in detail the manufacture of caustic soda and chlorine by diaphragm process with a neat flow sheet. **10**

(b) What are the advantages and disadvantages of membrane cell for caustic soda production? **05**

4.	**(a)**	Discuss in detail the manufacture of sulphuric acid by contact process with a neat flow sheet.	**10**
	(b)	Write the chemical reactions involved in Dual processfor manufacture of soda ash.What are the major engineering problems in thisprocess?	**05**
5.	**(a)**	With a neat flow diagram describe in detail about extraction of vegetable oil from oil seed along with its purification.	**10**
	(b)	How glycerine is recovered as by-product from soap and fatty acids ? Explain with the help of a flow diagram.	**05**
6.	**(a)**	Discuss in detail the Kraft pulping process with a neat flow sheet.	**10**
	(b)	Compare between the sulphate and sulphite pulping processes for pulp manufacture.	**05**
7.	**(a)**	Describe the manufacture of starch with the help of a flow diagram. Mention the derivatives of starch.	**10**
	(b)	What are the major engineering problems involved in sugar manufacture from sugar cane.	**05**
8.	**(a)**	Describe the manufacture of industrial alcohol from molasses with a neat flow sheet. Mention the chemical reactions involved in this process.	**10**
	(b)	Write chemical reactions, properties, and uses of Urea Formaldehyde.	**05**
9.	**(a)**	Describe the manufacture of Nylon 6,6 with a neat flow diagram.Write properties and uses of both nylon 6 and nylon 6,6.	**10**
	(b)	Describe the manufacture of polystyrene with a neat flow diagram.	**05**
