Registration No.										

Total number of pages: 03 **B.Tech.**
PCE3I102

3rd Semester Regular/Back Examination 2017-18
CHEMICAL TECHNOLOGY
BRANCH : CHEM
Time : 3 Hours
Max Marks : 100
Q.CODE : B858

Answer Question No.1 and 2 which are compulsory and any four from the rest.
The figures in the right hand margin indicate marks.
Assume suitable notations and any missing data wherever necessary.
Answer all parts of a question at a place.

1. Answer the following questions : (2x10)

(a) The catalytic converter for conversion of SO_2 to SO_3 by contact process should have a feed with SO_2 content between:
- A. 2 – 5 %
- B. 7 – 10 %
- C. 12 – 15 %
- D. 20 – 25%

(b) Diaphragm electrolytic cell produces
- A. 70% NaOH solution
- B. 60% NaOH solution
- C. 98.5 % NaOH solution
- D. 10 – 12% NaOH solution

(c) Which one of the following is not likely to be constituent of vegetable oil?
- A. citric acid
- B. oleic acid
- C. stearic acid
- D. glycerol

(d) Soap may be prepared by
- A. hydrolysis of tallow
- B. hydrogenation of vegetable oils
- C. boiling the vegetable oils or tallow with caustic soda solution
- D. oxidation of tallow

(e) Which of the following is a detergent ?
- A. benzene hexachloride
- B. cellulose nitrate
- C. polyvinyl chloride
- D. alkyl benzene sulfonate

(f) In the sulphate pulp process, the digestor conditions are:
- A. 120 – 130^{0}C and 5atm
- B. 120– 130^{0}C and 15atm
- C. 75–80^{0}C and 15 atm
- D. 175 – 180^{0}C and 10 atm
- E. None of these

(g) The product(s) of inversion of sucrose is/are:
- A. glucose only
- B. fructose only
- C. both glucose and fructose
- D. lactose

(h) Glucose is converted into ethyl alcohol and carbon dioxide by the enzyme:
- A. Invertase
- B. Zymase
- C. Maltase
- D. Diastage

(i) Which of the following is not a thermoplastic?
- A. polystyrene
- B. polyvinyl chloride
- C. polyethylene
- D. bakelite

(j) The organic acid monomer in Nylon-6,6 is
- A. sebacic acid
- B. terephthallic acid
- C. adipic acid
- D. benzoic acid

2. Answer the following questions : (2x10)

(a) What is 'lime causticization' method of manufacture of caustic soda?

(b) What are the different sources for SO_2 in the manufacture of sulphuricacid?

(c) How HCl is produced from the chlorination process?

(d) What are the advantages of continuous saponification process over the batch process in soap production?

(e) Why the black liquor does enter at various sections of the digester during manufacture of pulp?

(f) What is white water?

(g) What is Gluten? How it is removed from starch ?

(h) What is bagasse? Write its uses.

(i) Write properties and uses of polypropylene.

(j) What is the difference between Nylon-6 and Nylon-6,6? Write their uses.

3. (a) Write the electrolysis reactions involved in Diaphragm and Mercury electrolytic cells for caustic soda production. **(4)**

(b) What are the advantages and disadvantages of mercury cell for caustic soda production? **(3)**

(c) Discuss in detail the manufacture of soda ash by "Solvay Process" with a neat flow sheet. **(8)**

4. (a) Describe in detail the manufacture of caustic soda and chlorine by membrane process with a neat flow sheet. **(5)**

(b) What is meant by hydrogenation in oil and fat industries ? Write methods of preparation of Ni catalyst used for hydrogenation. Briefly describe about hydrogenation of oil with the help of a flow diagram. **(10)**

5. (a) Discuss in detail the manufacture of soap with a neat flow sheet. Describe routes for getting synthetic glycerine. **(10)**

(b) What are pigments? Describe Titanium Dioxide pigment. **(5)**

6. (a) Discuss in detail the manufacture of sugar with a neat flow sheet. **(10)**

(b) Describe the method of production of Dextrin with a neat flow sheet. **(5)**

7. What are the different methods of production of pulp? Discuss in detail the Kraft pulping process with a neat flow sheet. How chemical is recovered from black liquor ? **(15)**

8. How ethyl alcohol is prepared by fermentation ? Mention the main and side reactions involved in this process. Discuss about the major engineering problems of ethyl alcohol industries. **(15)**

9. **(a)** Describe the manufacture of Polyethylene with a neat flow diagram. **(5)**

(b) Write the chemical reactions, properties, and uses of phenol formaldehyde. **(5)**

(c) Write short note on Polylactic acid. **(5)**