

## I B. Tech II Semester Supplementary Examinations, November - 2021

## ENGINEERING CHEMISTRY

(Com. to ECE, EEE, EIE, Bio-Tech, E Com E, Agri E)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)2. Answering the question in **Part-A** is Compulsory3. Answer any **THREE** Questions from **Part-B**PART -A

1. a) Calculate the temporary and permanent hardness of water contain the following salts:  $\text{Ca}(\text{HCO}_3)_2 = 42 \text{ mg/L}$ ,  $\text{Mg}(\text{HCO}_3)_2 = 25 \text{ mg/L}$ ,  $\text{CaSO}_4 = 24 \text{ mg/L}$ ;  $\text{MgCl}_2 = 20 \text{ mg/L}$ ;  $\text{CaCl}_2 = 23 \text{ mg/L}$ . (3M)
- b) Define battery. Discuss the types of batteries with examples. (4M)
- c) Explain hot dipping and metal cladding. (4M)
- d) Write the preparation and uses of polyethylene. (3M)
- e) Explain the advantages and disadvantages of gaseous fuels. (4M)
- f) Discuss arc discharge method for preparation of nanotubes. (4M)

PART -B

2. a) What are boiler troubles? Discuss the causes of priming and foaming and explain how can they be avoided? (8M)
- b) Discuss (i) working of photovoltaic cell (ii) reasons for deterioration of cement concrete (8M)
3. a) What are concentration cells? Explain the construction of concentration cells and its importance. (8M)
- b) Explain the different constituents added with examples during compounding of plastics. (8M)
4. a) Explain dry theory of corrosion. (8M)
- b) What is cracking? Explain fixed bed catalytic cracking with a neat labeled diagram. (8M)
5. a) Discuss the mechanical properties of polymers. (8M)
- b) Explain zeolite process with a neat sketch for softening of hard water. (8M)
6. a) Explain the terms: Calorific value, Gross calorific value and Net calorific value. Calculate the gross and net calorific value of coal containing the following composition: C = 62%, H = 17%, O = 7 %, S = 3 %, N = 2 % and remaining ash. Latent heat of steam = 587 cal/gm. (8M)
- b) What are fuel cells? Discuss the working of  $\text{H}_2\text{-O}_2$  fuel cell and mention its applications. (8M)
7. a) What are liquid crystals? Mention its properties. Explain the types of liquid crystals. (8M)
- b) What are surface coatings? Discuss the constituents and functions of paint. (8M)