

R16

Code No: 131AG

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech I Year I Semester Examinations, May - 2018

ENGINEERING CHEMISTRY

(Common to EEE, ECE, CSE, EIE, IT, ETM)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART- A**(25 Marks)**

- 1.a) What is the role of buffer in the estimation of hardness of water. [2]
- b) Explain the cause of Caustic embrittlement in boiler and suggest how to control it. [3]
- c) Write applications of fuel cells. [2]
- d) Write the Nernst equation and explain the terms. [3]
- e) Name the two natural and two synthetic polymers which are used in textile industry. [2]
- f) PVC is soft and brittle whereas Bakelite is hard and brittle. Give reason. [3]
- g) Why should an ideal fuel have moderate ignition temperature? [2]
- h) Gasoline containing tetra ethyl lead is used in internal combustion engines. Give reasons. [3]
- i) How RUL test is performed for a refractory? [2]
- j) Name the raw materials necessary for the preparation of Portland cement. [3]

PART-B**(50 Marks)**

- 2.a) Explain the steps involved in treatment of sewage water.
- b) Explain the principle involved in chlorination and ozonization and write its differences. [5+5]

OR

- 3.a) With neat diagram discuss Ion exchange process for softening of water.
- b) 100ml of a sample of hard water neutralizes exactly 12ml of 0.12N HCl using methyl orange as indicator. What kind of hardness is present? Express the same in terms of an equivalent of CaCO_3 ? [5+5]

- 4.a) With neat diagram explain the principle, construction and applications of Glass electrode.
- b) Differentiate Lithium cell and lithium ion cell. [5+5]

OR

- 5.a) What is an Electrochemical cell? Explain the construction and reactions of calomel electrode.
- b) Explain the construction and functioning of Nickel- Cadmium cell. [5+5]

- 6.a) What is Co- polymerization? Explain preparation of Nylon 6:6 and Bakelite.
- b) Explain the concept of Biodegradable polymers. Discuss two examples and its applications. [5+5]

OR

7.a) Differentiate natural rubber and synthetic rubber with suitable examples. [5+5]
b) With suitable examples differentiate fibre, plastic and elastomer.

8.a) What is cracking? Describe the process of moving bed catalytic cracking.
b) The percentage composition of coal is C = 89%, O = 4%, N = 0.5%, S = 1%. Calculate HCV and percentage of hydrogen of the coal sample. [5+5]

OR

9.a) With neat diagram explain refining of petroleum.
b) What is coal? Explain the proximate method for the analysis of coal. [5+5]

10.a) What are composite? Explain classification and applications of composite materials.
b) What is lubricant? Explain viscosity and cloud and pour points of a lubricating oil. [5+5]

OR

11.a) Explain chemical reactions involved in setting and hardening of portland cement.

b) Write short notes on
i) Refractories ii) special cements [5+5]

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