

Code No: 132AG

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech I Year II Semester Examinations, August/September - 2017

ENGINEERING CHEMISTRY

(Common to CE, ME, MCT, MMT, MIE, CEE, MSNT)

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) Write the specifications of potable water. [2]
- b) What is Caustic embrittlement? Give chemical reaction involved. [3]
- c) What are secondary cells? Give two examples. [2]
- d) What is single electrode potential? Write Nernst equation to calculate electrode potential. [3]
- e) Give the characteristics of Elastomers. [2]
- f) Write short note on free radical addition polymerisation. [3]
- g) Explain the importance of Octane number. [2]
- h) What is CNG? Give its composition and characteristic properties. [3]
- i) Define flash and fire point of a lubricant. [2]
- j) What are special cements? Give their uses. [3]

PART-B

(50 Marks)

- 2.a) Explain the Break point chlorination and give its significance.
- b) A Sample of water showed the following analysis
 $\text{CaCl}_2 = 2.22\text{mg/l}$; $\text{Mg}(\text{NO}_3)_2 = 1.48\text{mg/l}$; $\text{KCl} = 7.45\text{mg/l}$; $\text{CaSO}_4 = 1.36\text{ mg/l}$;
 $\text{Mg}(\text{HCO}_3) = 2.92\text{ mg/l}$; *Organic impurities = 1.22mg/l.*
Calculate the temporary and permanent hardness of the given water sample. [5+5]

OR

- 3.a) Differentiate between chlorination and ozonation disinfection methods of potable water.
- b) Explain the steps involved in treatment of sewage water. [5+5]
- 4.a) What are fuel cells? Explain the construction and working of hydrogen oxygen fuel cell.
- b) What do you understand by electrochemical series? Explain its applications. [5+5]

OR

- 5.a) Explain the construction, working and application of glass electrode with neat diagram.
- b) Explain the chemical reactions of lead acid battery during its charging and discharging. [5+5]

- 6.a) Differentiate between thermoplastics and thermosetting plastics with suitable examples.
b) What are conducting polymers? Explain the conduction mechanism in trans-polyacetylene and give its applications. [5+5]

OR

- 7.a) What are Fiber reinforced plastics? Give their applications.
b) Write about the compounding and fabrication of plastic. [5+5]

- 8.a) Explain the proximate method of analysis of coal and write its significance.
b) Describe the Fisher-Tropsch's process for the synthetic petrol. [5+5]

OR

- 9.a) What is HCV and LCV of a fuel? Explain their inter relationship.
b) With neat diagram, explain the petroleum refining. [5+5]

- 10.a) What are composites? Give the classification and applications of composite materials.
b) Explain the mechanism of extreme pressure lubrication with suitable examples. [5+5]

OR

- 11.a) What is a refractory? Give their characteristic properties and applications.
b) Give the composition, setting and hardening of Portland cement. [5+5]

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