

Code No: 121AE

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B.Tech I Year Examinations, September/October - 2021****ENGINEERING CHEMISTRY****(Common to CE, EEE, ME, ECE, CSE, IT, MCT, AE, MIE, PTM)****Time: 3 Hours****Max. Marks: 75****Answer any five questions
All questions carry equal marks**

- 1.a) Discuss the construction and working principle of methanol oxygen fuel cell.
b) Discuss various factors affecting rate of corrosion. [7+8]
- 2.a) Explain electroplating of copper.
b) How to determine P^H of a unknown solution using glass electrode. [7+8]
- 3.a) Write the preparation, properties and engineering applications of Bakelite.
b) Write preparation of poly vinyl acetate and polylactic acid. [7+8]
- 4.a) Explain sol gel and chemical vapour deposition of preparing Nano materials.
b) What is lubricant? Explain cloud point, flash and fire points and write their significance. [7+8]
- 5.a) What is the principle of reverse osmosis? What is the main advantage of reverse osmosis over ion exchange process?
b) Write the chemical reactions involved in lime soda process where lime and soda is required to remove impurities. [7+8]
- 6.a) What is break point chlorination? State its significance.
b) Explain formation of scales and sludges in boilers and write methods of prevention.
c) Calculate the quantity of lime and soda required for softening 10,000 litres of water containing following constituents.
 $CaCO_3 = 1.85\text{mg/L}$, $CaSO_4 = 0.34\text{mg/L}$, $MgCO_3 = 0.42\text{mg/L}$;
 $MgCl_2 = 0.76\text{ mg/L}$, $MgSO_4 = 0.90\text{ mg/L}$, $NaCl = 2.34\text{ mg/L}$ and
 $SiO_2 = 2.32\text{ mg/L}$. [5+5+5]
- 7.a) Explain ultimate analysis of coal and write its significance.
b) What is meant by cracking of petroleum? Explain fluid bed catalytic cracking of gasoline and give its significance. [7+8]
- 8.a) What are colloids? Explain their electrical properties.
b) Discuss the applications of phase rule to water system.
c) Explain Freundlich adsorption isotherm and its applications. [5+5+5]

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