

Code No: 121AE

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B.Tech I Year Examinations, October/November - 2020****ENGINEERING CHEMISTRY****(Common to CE, EEE, ME, ECE, CSE, IT, ETM, AE, MIE, PTM)****Time: 2 hours****Max. Marks: 75****Answer any five questions  
All questions carry equal marks**

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- 1.a) Explain the advantages and applications of methanol – oxygen fuel cell.  
b) How do you determine  $P^H$  of a solution using glass electrodes? [7+8]
- 2.a) Discuss the factors effecting corrosion based on the nature of metal.  
b) What is specific, equivalent and molar conductance of electrolyte? Derive expression. [7+8]
- 3.a) Differentiate thermosetting and thermoplastic polymers.  
b) Give the preparation, properties and engineering applications of Thiokol rubber.  
c) Give an account on preparation and applications of poly lactic acid. [5+5+5]
- 4.a) Explain compression molding of plastics.  
b) What are the advantages of vulcanization? Explain the process.  
c) How nano materials are prepared by sol-gel method? [5+5+5]
- 5.a) What are scales and sludges. How are they caused and how they are removed from boilers.  
b) Give an account on caustic embrittlement with chemical reaction.  
c) Explain calgon and phosphate conditioning. [5+5+5]
- 6.a) Why hardness of water is expressed in  $CaCO_3$  equivalents. Give the causes and effects of hard water.  
b) Explain zeolite process for purification of water.  
c) Give the steps involve in the treatment of potable water. [5+5+5]
- 7.a) Explain about fixed bed catalytic cracking.  
b) How is coal analyzed by proximate analysis?  
c) What is LCV and HCV? How are they related? [5+5+5]
- 8.a) Explain the phase diagram for water system.  
b) Give the application of colloids in industry.  
c) Explain freundlichs adsorption theory. How does it differs from Langmuir's theory? [5+5+5]

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