

**R09**

**Code No: 09A1BS03**

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**

**B.Tech I Year Examinations, November/December – 2013**

**ENGINEERING CHEMISTRY**

**(Common to all Branches)**

**Time: 3 hours**

**Max. Marks: 75**

**Answer any five questions  
All questions carry equal marks**

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- 1.a) Give the chemical reactions involved in setting and hardening of Portland cement.
- b) What is viscosity? What is the importance of viscosity and viscosity index of a lubricant?
- c) What are the insulators? How are they classified? What are their applications? [5+5+5]
- 2.a) Explain two component system by taking lead-silver system as an example.
- b) What is the significance of Gibb's phase rule? Discuss its applications and limitations. [7+8]
- 3.a) How do you analyse flue gas by orsat's method?
- b) Calculate the minimum amount of air required for complete combustion of 1 kg of coal sample having the following compositions C = 80% O = 8% S = 2% H = 5% N = 1% and ash = 4%. Oxygen in air is 23% by weight. [8+7]
- 4.a) Explain Langmuir adsorption isotherm. What are the advantages and limitations of Langmuir adsorption theory?
- b) What are the different types of preparation and applications of Nano materials? [8+7]
- 5.a) How do you estimate temporary and permanent hardness of water by EDIA method?
- b) A sample of water containing the following impurities. Calculate the quantity of lime and soda required for purification of 10,000 liters of water  
Mg(HCO<sub>3</sub>)<sub>2</sub> = 73 mg, CaCl<sub>2</sub> = 222 mg, Mg SO<sub>4</sub> = 73 mg,  
Ca(NO<sub>3</sub>)<sub>2</sub> = 162 mg, NaCl = 58.5 mg [8+7]
- 6.a) Explain the chain growth mechanism of polymer by taking an example.
- b) What are conducting polymers? Write about the properties and applications of poly aniline and poly acetylene. [7+8]
- 7.a) Explain the electro chemical corrosion by taking rusting of iron as example.
- b) Explain sacrificial anodic cathodic protection.
- c) What is paint? Write its constituent and functions. [5+5+5]
- 8.a) Write definition and units of specific, equivalent and molar conductance.
- b) Explain kohltraush's law and mention its applications.
- c) Explain working of lead-acid battery. [5+5+5]

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