Code No: 09A1BS03 **R09**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD

B. Tech I Year Examinations, December-2012

ENGINEERING CHEMISTRY

(Common to all Branches)

Time: 3 hours

Answer any five questions

All questions carry equal marks

1.a) Explain the terms, specific conductance, equivalent conductance, ionic conductance and ionic mobility.

b) What is a primary cell and secondary cell? Explain the functioning of lead-acid cell. [8+7]

2.a) What is corrosion? Explain the various factors affecting the rate of corrosion.

b) Explain the hot dipping and electroplating methods of coating a metal. [8+7]

3.a) What is a Plastic? Explain a method of compounding and fabrication of plastics.

b) What is an elastomer? Explain the preparation, properties and uses of Thiokol rubber. [8+7]

4.a) What is hardness of water ? Explain how reverse Osmasis process can soften the water.

b) Calculate the temporary and permanent hardness of 100 litre of a water containing the following impurities per litre. $MgCl_2$=19mg , $MgSO_4$=60mg , NaCl =36.5mg, $CaCl_2$=11.1mg, $Ca(HCO_3)$=32.4mg and $Mg(HCO_3)_2$= 7.3mg. [8+7]

5.a) What is adsorption? What are their types? Explain Longmuir adsorption isotherm.

b) What are colloids? Give the classification and applications of colloids. [8+7]

6.a) Explain how coal sample is analysed by proximate method. Also give its significance.

b) Calculate gross and net calorific value of a gaseous fuel from the following data. Volume of fuel burnt at STP is $0.09m^3$, weight of water used for cooling 25kg. Temperature of inlet and outlet water is 25^0 C and 30^0 C respectively. Weight of water obtained by steam condensation is 0.02 kg. Latent heat of steam is 587K.cal/kg. [8+7]

7.a) Explain the following terms with suitable examples. Phase, component, degree of freedom, triple point.

b) What is phase rule? Explain the phase diagram of water system. [8+7]

8. Write an account on the following:

a) Setting and hardening of cement.

b) Applications of nano materials.

c) Advantages of fuel cells. [15]

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