MLR INSTITUTE OF TECHNOLOGY

(Autonomous Institute)

I B.Tech I Sem Supplementary/Improvement Examinations, February-2016

ENGINEERING CHEMISTRY

(Common to CSE,IT & Aero)

Note: 1. This question paper contains two parts A and B.

2. Part A is compulsory which carries 25 marks. Answer all Questions in part A.

3. 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) What is specific conductance?   [2M]
   b) Differentiate primary cells and secondary cells.   [2M]
   c) What is hardness of water? And what are the types of hardness.   [2M]
   d) Write the preparation of TEFLON, and write the chemical reaction. [2M]
   e) What is the Eutectic temperature and Eutectic composition of Pb-Ag system? [2M]

2) a) Calculate the electrode potential of Zinc electrode in which a Zn rod is
      immersed in 0.1M $ZnSO_4$ solution at 278k .($E^0_{(Zn2+/Zn)}$ = -0.76V)   3M
   b) Explain the process of Tinning.   [3M]
   c) Describe how the Natural rubber is prepared from Latex.   [3M]
   d) Explain the determination of carbon and hydrogen in the coal sample. [3M]
   e) Write the differences between Lyophillic and Lyophobic colloid. [3M]

PART-B   (50 marks)

3) a) Derive the Nernst equation.   [6M]
   b) What is the Electrochemical series? Give its applications   [4M]

                              (OR)

4) a) Explain the construction and working of Leclache cell.   [5M]
   b) Explain the theory of Electrochemical corrosion.   [5M]

5) a) Calculate the Total and Permanent hardness of a given hard water sample containing
      16.2mg/l of Ca $(HCO3)_2$, 7.3mg/l of Mg $(HCO3)_2$, 9.5mg/l of $MgCl_2$ and 13.6mg/l of
      $CaSO_4$. (Molecular weight of Ca $(HCO3)_2$ =162,Mg $(HCO3)_2$ =146,$MgCl_2$ =95
      $CaSO_4$=136)   [5M]
   b) Explain Ion-Exchange process of softening of water.   [5M]

                              (OR)

6) a) What is desalination? Explain the desalination process by Reverse osmosis.   [5M]
   b) What is meant by internal treatment? Explain Calgon treatment. [5M]

7) a) Explain the process of Vulcanization.   [6M]
   b) Give the preparation of Buna-s with equation, its properties and uses.   [4M]
                              OR

8) a) Give the characteristics of a good lubricating oil. [5M]
   b) Give the preparation and applications of nonmaterials. [5M]
9) a) Define calorific value. AND classify them with theoretical formula of Dulong`s [4M]
   b) A coal sample has the following composition by weight C=79%, H_2=8%,
      O_2=5%, S=3% and N_2=1% rest is ash. Find the minimum weight and volume of air
      required to Burn 1kg of the coal sample . [6M]

                              (OR)

10) a) Explain the fractional distillation of petroleum, give the approximate composition and uses
       of fractions obtained. [6M]
    b) Write short notes on LPG. [2M]
    c) Significance of the Flue gas analysis. [2M]
11) a) What is phase rule? Give the terms involved in of phase rule equation with examples.[6M]
    b) Explain the Langmuir adsorption isotherm. [4M]

                              (OR)

12) a) Explain the triple eutectic point of one and two component systems . [7M]
    b) Give the applications of colloids. [3M]