Code No: 131AG

R16

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech I Year I Semester Examinations, May/June - 2017
ENGINEERING CHEMISTRY
(Common to EEE, ECE, CSE, EIE, IT)

Time: 3 hours   Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A.
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 hard water? What are the salts that cause hardness to water?   [2]
  b)   How are the salts from sea water removed?   [3]
  c)   Differentiate between primary and secondary cell.   [2]
  d)   Write the Nernst equation and mention its importance?   [3]
  e)   Write the structures of natural rubber and vulcanized rubber?   [2]
  f)   Write a brief note on compounding of plastics.   [3]
  g)   Define Cracking and knocking.   [2]
  h)   How the volatile matter content in coal is determined?   [3]
  i)   Define Refractory and Lubricant?   [2]
  j)   Write the composition of Portland cement?   [3]

Part - B (50 Marks)

2.a)   Explain about the ion exchange method of softening of water.
  b)   A sample of water contains following dissolved salts per liter.
       $Ca(HCO_3)_2$=16.2mg, $Mg(HCO_3)_2$=14.6mg, $CaCl_2$=11.1mg and $MgSO_4$=12mg.
       Calculate the total, permanent and temporary hardness of water?   [5+5]
OR
3.a)   What is disinfection of water? Explain the chlorination method.
  b)   Explain the steps involved in sewage treatment.   [5+5]

4.a)   Explain the construction and working of calomel electrode in the determination of pH of a solution
  b)   Calculate the EMF of the following cell.
           $Zn/ZnSO_4//FeSO_4/Fe$
       The standard electrode potentials of Zn^{+2}/Zn = **-** 0.76V and Fe^{+2}/Fe = 0.44V.   [7+3]
OR
5.a)   What is electrochemical series? Give its five applications.
  b)   Explain the construction and functioning of Nickel –Cadmium cell.   [5+5]

6.a)   Write the differences between thermoplastics and thermosetting plastics.
  b)   Give preparation, properties and engineering applications of Bakelite. [5+5]
OR

7.a) Write preparation, properties and engineering applications of i) Buna-S and ii) Thiokol rubber?

  b) Explain the mechanism of conduction in conducting polymers with respect to transpolyacetylene?   [5+5]

8.a) Explain the proximate analysis of coal and give its significance?

  b) A coal sample has 80% of carbon, 9% of hydrogen, 6% of sulphur and remaining is ash. Calculate the HCV and LCV of the coal sample?   [5+5]

OR

9.a) What is Octane number and Cetane number? What is their significance?

  b) Explain about moving bed catalytic cracking.   [5+5]

10.a) Write a note on special cements.

  b) What viscosity of lubricant? How is it determined?   [5+5]

OR

11.a) What is Cloud point, Pour point, Flash point and Fire point of a lubricant? Give their significance.

  b) What are the characteristics of a good refractory?   [6+4]

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