GLA University, Mathura

II-Mid Term Examination, 2011-12

Course: - B.Tech I-Year, I-Sem.

Subject: -Engg.Chemistry **Univ. Roll No:-**

Time:-90 Minutes **Total Marks:-40**

Notes:-

1) Answer all questions from Group A (which is) **compulsory, Any Two** from Group B and **Any Two** from Group C.
2) All parts of a question (a, b, etc.) should be answered at one place.
3) Answer should be brief and to-the-point and be supplemented with neat sketches.
4) Any missing or wrong data may be assumed suitably giving proper justification.
5) Figures on the right-hand side margin indicate full marks.

Group A

Attempt all the questions **1x16=16**

1. Which ion is not there in naturally occurring zeolite.
   a) Na^+ b) Ca^{2+} c) Al^{3+} d) Si^{4+}
2. Alkalinity in water can not be due to the presence of
   a) HO^- only b) HO^- and HCO_3^- c) HO^- and CO_3^{--} d) CO_3^{--} and HCO_3^-
3. Terylene is a
   a) Polyglycol b) Polyester c) Polyamide d) polycarbonate
4. Which one is a co-polymer?
   a) PVC b)Buna S c) Teflon d) Nylon-6
5. Another name of PMMA is
   a) Teflon b) Plexi Glass c) poly methyl methylate d) Dacron
6. Monomer Unit of nylon 6
   a) Cyclohexanone b) Caprolactum c) Caprolactone d) Adipic acid
7. A system consist of water in equilibrium with its vapor, the degree of freedom is
   a) 2 b) 1 c) 0 d) 3
8. At triple point of water system, The system is
   a) Univariant b) Invariant c) Bivariant d) Trivariant
9. The pH value of 0.005 M $Ba(OH)_2$ solution is
   a) 2.3 b) 12 c) 11.7 d) 11.3
10. The correct relationship between various units of Hardness
    a) 1 ppm = 10 $^\circ$Fr = 70000 $^\circ$Cl b) 1 ppm = 0.1 $^\circ$Fr = 0.07 $^\circ$Cl
    b) 10^6 ppm = 0.1 $^\circ$Fr = 0.07 $^\circ$Cl d) 1 ppm = 0.01 $^\circ$Fr = 0.7 $^\circ$Cl
11. Which is used for removing the temporary Hardness
    a) Lime soda process b) Boiling c) Zeolite process d) Ion exchange
12. The chemical name of Teflon is .....
13. Write the example of basic buffer solution.....
14. Write the critical temperature of water.....
15. Water is used in boiler to produce .....to generate.....
16. Write the structure of Ziegler–Natta catalyst.....

Group B

Attempt any TWO questions **6x2=12**

Q -1. Write the preparation, properties and uses of Dacron

Q- 2. Calculate the phase, component and degree of freedom in the following system-

(a) $CaCO_3$ (s) $\rightleftharpoons$ $CaO(s) + CO_{2(g)}$
(b) Water (liquid) $\rightleftharpoons$ Water vapour at 1 atm
(c) $NH_4Cl(s)$ $\rightleftharpoons$ $NH_3(g) + HCl(g)$ where $P_{NH3} = P_{HCl}$

A buffer solution contain 0.015 mole/L NH_4OH & 0.025 mole/L NH_4Cl. Calculate the pH value of solution. ($PK_b = 1.8 \times 10^{-5}$)

Q- 3. Write the specification of water recommended to be used in boilers. What problems may appear in boiler if water of recommended specification is not used?

Group C

Attempt any TWO questions **6x2=12**

Q-1. What do you mean by hardness of water? Discuss type of hardness. How temporary hardness can be removed? Derive the Henderson's equation for acidic buffer solutions.

OR

Derive ppm from mg/L. Discuss limitations and advantages of zeolite process.

Q -2 State and explain phase rule. Discuss the salient features of water system with a neat phase diagram.

Q- 3 What is polymer? Classify them on the basis of tacticity with suitable examples. Discuss the mechanism of polymerization of vinylchloride in presence of organic peroxide.