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FIRST SEMESTER B.Tech.

END SEMESTER EXAMINATION *November-2014*

AC-104 APPLIED CHEMISTRY

Time: 3:00 Hours *Max. Marks: 70*

Note: Question No 1 is compulsory. Answer any *Five* questions from remaining.
Assume suitable missing data, if any.

1[a] A sample of pure sodium carbonate, Na_2CO_3, weighing 0.3542 g is dissolved in water and titrated with a solution of hydrochloric acid. Write the chemical equation(s) and draw a suitable titrimetric curve for the same to choose a suitable indicator. A volume of 30.23 ml is required to reach the end point. Calculate the normality of the acid solution. [5]

[b] A polydisperse sample of PVA is prepared by mixing four mono-disperse samples in the following proportions:

2g - 10,000 molecular weight

0.5g - 5000 molecular weight

1g - 25,000 molecular weight

3g - 1,00 000 molecular weight

Using this information, calculate the PDI of the mixture. [5]

2[a] Draw the DTA thermogram for calcium oxalate decomposition by flowing air and explain the features with suitable chemical equations. [6]

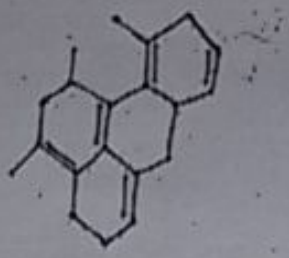
[b] Draw and explain the phase diagram of sulphur system. [6]

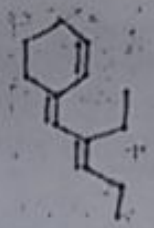
3[a] A 0.570 g sample of an alloy steel is dissolved, the manganese is oxidized to permanganate, and the solution is diluted to 100 mL in a volumetric flask. The absorbance at 525 nm in a 1.00-cm cell is 523. The molar absorptivity of MnO_4^- at 525 nm is 2.24×10^3. Calculate the percentage of Mn in the steel. (At Wt of Mn= 55) [6]

[b] Differentiate DNA and RNA. Draw their monomer structures. [6]

4[a] What is mean by Tacticity? Classify the polymers based on tacticity and explain with suitable example. [6]

[b] Calculate λ_{max} for the following molecules [6]





5[a] How will you distinguish the following using infrared spectroscopy and give a neat sketch of appropriate spectra. [6]

(i) Inter and intra molecular hydrogen bonding (explain with an example)

(ii) Ethanol and acetone

[b] Discuss the general characteristics of Battery and explain how temperature will affect a battery function with a suitable example? [6]

6[a] Draw Fischer and Haworth structure of D-Glucose and give its reaction with the following (i) Phenyl hydrazine (ii) Hydroxylamine and Na/Hg, H_2O. [6]

[b] What is eutectic mixture? Explian this with the help of phase diagram of Pb-Ag system. [6]

7 Write short note on **any two** of the following: [6+6]

(a) Phase transfer catalyst

(b) Gold Plating

(c) Biodegradable polymer

(d) Ionic Liquids