Roll No. XXX/CE/

SECOND SEMESTER

B. TECH. [Group B]

END SEMESTER EXAMINATION

MAY-2011

AC-104 APPLIED CHEMISTRY

Time: 3 Hours

Max. Marks : 70

Note : Question No **ONE** is compulsory.
Answer any **FOUR** questions from the remaining.
Assume suitable missing data, if any.

1   Answer the following questions:

[a] What is the significance of salt bridge? Give the components present in salt bridge.

[b] Explain the discharge curve for a battery with a suitable graph.

[c] Explain why glycine exists as a zwitter ion but o-and p- aminobenzoic acids do not?

[d] Is it possible to have a quadruple point on a phase-diagrams for a one-component system? Explain the answer.

[e] Draw the Haworth projection formula of maltose. Is it a reducing sugar?

[f] List the electronic transitions possible for CH_3Cl and $HCHO$.

[g] Draw typical TG curves for drying and atmospheric reactions in thermal analysis.

[h] Out of DNA and RNA, which one is more stable and why?

[i] What are the products of electrolysis of molten sodium chloride and aqueous sodium chloride?

[j] Give one example each of ionic liquid, phase transfer catalyst, polymer supported reagent and solid acid.

$10 \times 2 = 20$

2[a] Calculate λ_{max} for the following molecules using Woodward-Fiesher rule:

6
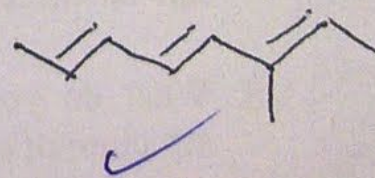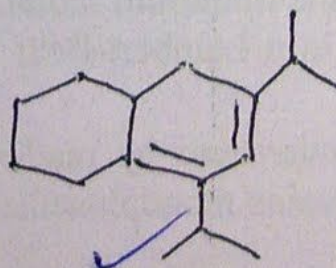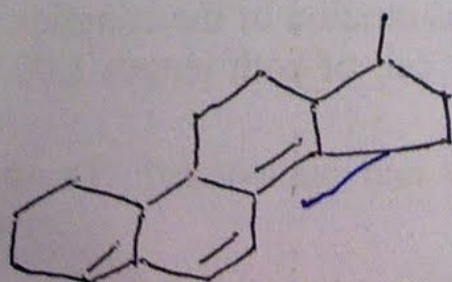
[b] How many triple points are possible in the phase diagram of water and sulphur system each? 2.5

[c] Write the name and chemical structure of monomers of following polymers :-Nylon-6, PVC, Nylon – 6, 6 and Natural rubber. 4

3[a] What do you mean by primary and secondary batteries? Explain lead storage battery with charging and discharging reactions. 5

[b] A reaction of n-butanol and sodium bromide in the presence of sulphuric acid gives 1-bromo butane, sodium bisulphate and water. Calculate atom economy with respect to the product 1-bromobutane. 4

[c] Explain why $KCl-NaCl-H_2O$ should be regarded as a 3-component system where as $KCl-NaBr-H_2O$ as a 4-component system. 3.5

4[a] What do you mean by DSC in thermal analysis? Explain the instrument used to measure DSC. 4

[b] Explain eutectic point with the help of suitable phase diagram. 4

[c] A mixture of $KMnO_4$ and $K_2Cr_2O_7$ weighing 0.24 g on being treated with KI in acid solution liberates just sufficient I_2 to react with 60 ml of 0.1N hypo. Find out percentage of Cr and Mn in the mixture. 4.5

5[a] An equimolar mixture of two polymers has a number –average molar mass 1.00 Kgmol^{-1} and weight-average molar mass 1.20 Kgmol^{-1}. Determine the molar masses of the two polymers. 4

[b] List any five principles of green chemistry. Explain any one of them in detail. 4.5

[c] What are the advantages and disadvantages of Lithium-ion batteries? 4

6[a] What do you understand by green solvents? Explain their merits over traditional solvents. 4.5

[b] The molar extinction coefficient of phenanthroline complex of iron (II) is 12000 dm^3 mol^{-1}cm^{-1} and the minimum detectable absorbance is 0.01. Calculate the minimum molar concentration of the complex that can be detected in a Lambert-Bear Law cell of path length 1.00 cm. 4

[c] What do you understand by nucleoside and nucleotide? Draw the structure of adenosine monophosphate. 4

7 Write short notes on any THREE of the following:
[a] Structural features of proteins
[b] Cationic polymerization
[c] Precipitation titrations
[d] Electroplating.

12.5