Total Number of Pages 3

Roll No. 08123

FIRST SEMESTER

B.Tech.(Group-A)

END SEMESTER EXAMINATION

NOVEMBER-2010

AC-104 APPLIED CHEMISTRY

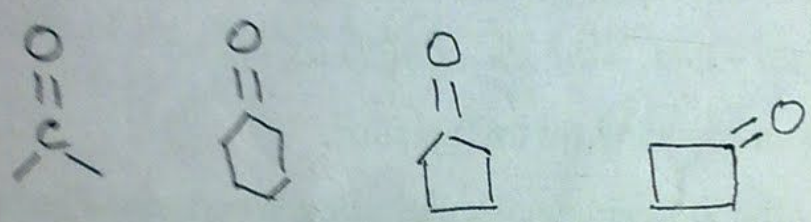
30

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

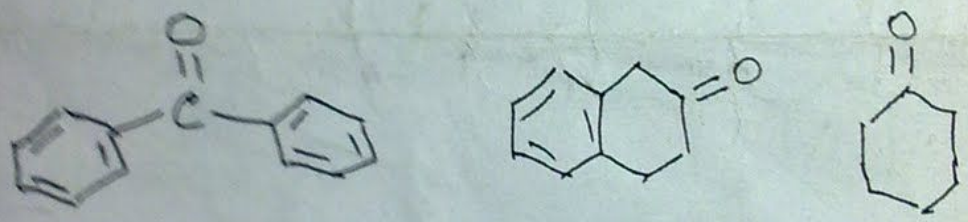
Note : Answer any *FIVE* questions.
Assume suitable missing data, if any.

1[a] Arrange the following molecules in their increasing order of stretching frequency of > C = 0. Discuss the reason. 4

(i)



(ii)



[b] Classify the polymers on the basis of stereochemistry. Explain with the help of suitable examples. 4

[c] Write down the chemical structure of following indicators used in volumetric analysis. Are these water soluble? Explain in detail.

(i) Phenolphthalein

(ii) Methyl orange

(iii) EBT 6

2[a] 25 ml of a solution containing Na_2CO_3 and $NaHCO_3$ requires 5ml of 0.1 N HCl for titration using phenolphthalein as an indicator. The titration was repeated with the same volume of this solution but using methyl orange as an indicator requires only 12.5 ml of 0.1 N HCl for titration. Calculate the amount of both Na_2CO_3 and $NaHCO_3$ in the solution. 4

[b] Describe the sources of radiation used in IR and UV-Visible spectroscopy. 4

[c] What do you understand by anionic polymerization? Explain its mechanism with suitable example. 6

3[a] What do you understand by DSC? How DSC is being used to identify the impurity in a compound? 4

[b] Identify two geometrical isomers of $C_6H_5CH = CHC_6H_5$ from their λ_{max}, i.e., 294 and 278 nm. 3

[c] What do you mean by eutectic point? Discuss an application of phase diagram with a suitable example. Also, construct a phase diagram for Pb-Ag system. 7

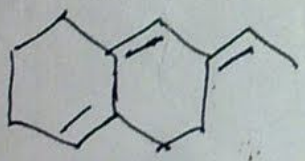
4[a] 1-Chlorohexane can be prepared by the following substitution reaction:

$$CH_3(CH_2)_4CH_2OH + SOCl_2 \rightarrow CH_3(CH_2)_4CH_2Cl + SO_2 + HCl$$

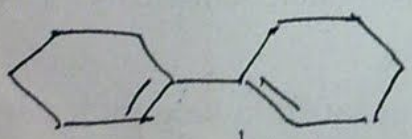
Find out the % atom economy for this reaction. 5

[b] Calculate λ_{max} for the following molecules using Woodward-Fiesher rule. 4

(i)



(ii)



[c] Explain phase diagram of sulphur system in detail. How many triple points can exist in this system? Discuss in detail. 5

5[a] Discuss about the characteristics of a battery. How temperature will affect a battery function? Also explain the components of a battery used in mobile phones. 5

[b] What do you mean by green chemistry? List out the principles/characteristics of green chemistry. Explain atleast one with examples. 4

[c] Write the open chain structure for D-glucose. Give its reactions with:

(i) Hydroxylamine

(ii) Bromine water

(iii) Na/Hg, H_2O

(iv) Cone. HNO_3

(v) Phenyl hydrazine

5

6[a] What do you mean by active materials? Why lithium batteries are considered more advanced? Also write anode and cathode reactions of a fuel cell and discuss the advantages. 5

[b] Discuss green catalysts and green solvents. 4

[c] Draw the structure of the peptide Ala-Gly-Ala. Also, discuss the structure of proteins. 5

7 Write notes on any ***FOUR*** of the following:

(i) Electroplating

(ii) Ionic liquids

(iii) Phase transfer catalyst

(iv) DNA melting

(v) Theory of indicators

(vi) Biodegradable polymers

3½ x4