

## V.P. &amp; R.P.T.P.SCIENCE COLLEGE

## T.Y. B.Sc.(SEM – V) INTERNAL EXAMINATION

Physical Chemistry: US05CCHE05

Time: 3:30 p.m. to 5:00 p.m.

Date: 05-10-2013, Saturday

Total Marks: 30

Q – 1 : Choose the correct option from the following.( Multiple choice question)

[06]

(i) Factors affecting quantum yield is

(a) temperature (b) pressure (c) concentration of reactant (d) catalyst

(ii) Incandescence is a process in which thermal energy is converted into

(a) electrical energy (b) magnetic energy (c) solar energy (d) light energy

(iii) Natural rubber is basically a polymer of

(a) propylene (b) isoprene (c) chloroprene (d) ethylene

(iv) The formation of a condensation polymer generally involves

(a) the addition of a plasticizer to polymer (b) the elimination of a small molecule

(c) the mixing of a sulphure with latex (d) the addition of a small molecule

(v) Which of the following technique yield a weight average molecular weight?

(a) viscometry (b) osmometry

(c) light scattering (d) cryoscopy

(vi) Mark Houwink Sakurada equation is given by

(a)  $[\eta] = kM^a$  (b)  $\eta_{sp} = \eta_{rel}^{-1}$  (c)  $\eta_{red} = \eta_{sp}/c$  (d)  $\eta_{rel} = \eta/\eta_0$ 

Q – 2 : Answer the following. (Any three)

[06]

(i) Differentiate: Fluorescence and Phosphorescence.

(ii) Draw the isotactic, syndiotactic and atactic isomers of polypropylene polymer.

(iii) Differentiate: Homopolymer and Copolymer.

(iv) What is polydispersity? How it is related with number average and weight average molecular weight?

(v) Define: (a) Intersystem crossing (b) Interconversion (c) Dark reaction (d) photochemical reaction

(vi) Define the critical micelle concentration. Give the name of two protective colloids.

Q-3 Derive and discuss deviation from Beer-Lambert law. Give application of Beer's law. [06]

OR

Q-3 For the photochemical reaction  $B \rightarrow C$ ,  $1 \times 10^{-5}$  mole of B was formed on absorption of  $6.62 \times 10^7$  ergs at  $3600 \text{ \AA}$ . Calculate the quantum yield. [06]

Q-4 (a) Discuss the mechanism and kinetics of anionic polymerization. [06]

OR

Q-4 (a) Distinguish between chain-growth and step-growth polymerization. [03]

(b) At the end of polymerization of P-hydroxybenzoic acid, IR analysis shows 0.17 mole percentage unreacted acid ( $-\text{COOH}$ ). Calculate molecular weight of polymer. [03]

Q-5 (a) List the different polymerization techniques. Describe the bulk and suspension polymerization technique. Mention the advantage, disadvantage and its application. [06]

OR

Q-5 (a) Write the principle, draw the sketch and describe the dilute solution viscosity method for the molecular weight determination of polymer. [06]

