

B.E./B.TECH. Degree Examination, January 2021
Semester – I
CY16151 - ENGINEERING CHEMISTRY I
(Regulation 2016)

Time: Three hours

Maximum: 80 Marks

Answer **ALL** questions**PART A - (8 X 2 = 16 marks)**

- Which of the following is a thermosetting polymer?
 - polystyrene
 - polyolefins
 - nylons
 - phenolic resins
- In photochemical reactions, absorption of _____ radiations takes place.
 - ultraviolet and visible
 - radio
 - only visible
 - visible and x-rays
- What is the point at which all the three phases of a system exist?
 - Triple point
 - Sublimation point
 - Vapor point
 - Eutectic point
- The colour of the nano gold particles is _____.
 - Yellow
 - Orange
 - Red
 - Variable
- Thermosetting plastics cannot be reused and reshaped? Justify.
- Mention any two applications of Clausius – Clapeyron equation.
- A solution of thickness 2 cm transmits 40% of the incident light. Calculate the concentration of the solution and given $\epsilon = 6000 \text{ dm}^3 \text{ mol}^{-1} \text{ cm}^{-1}$.
- What are carbon nanotubes?

PART B - (4 X16 = 64 marks)

- (a) (i) Elucidate the mechanism of step polymerisation with example. **(8)**
(ii) Give the preparation, structure and uses of the following polymers. **(8)**
 - Styrene – butadiene rubber
 - Epoxy resin

(OR)

- (b) (i) What is T_g ? Discuss the parameters affecting T_g and mention its significance. (8)
(ii) Illustrate with example any two polymerisation techniques. (8)
10. (a) (i) At what temperature water will boil when the atmosphere pressure is 528 mm Hg? Latent heat of vapourisation of water is 545.5cal/g. (8)
(ii) Deduce an expression for the variation of equilibrium constant of a reaction with temperature. (8)

(OR)

- (b) (i) Derive the various forms of Maxwell's relations. (16)
11. (a) (i) How would you explain very high and very low quantum yield of some photochemical reactions? (8)
(ii) Compare fluorescence and phosphorescence. (8)

(OR)

- (b) (i) Explain the various electronic transitions caused by the absorption of energy in the UV region with diagram. (8)
(ii) Enumerate any two applications for IR spectroscopy and UV- Visible spectroscopy. (8)
12. (a) (i) With the help of a neat phase diagram describe Ag-Pb system. What is meant by desilverisation of lead? (8)
(ii) Explain the following (8)
i. Annealing
ii. Composition, characteristics and uses of Nichrome

(OR)

- (b) (i) Elaborate the laser ablation and Solvothermal process of synthesizing nanoparticles with a neat sketch. (8)
(ii) List the applications of nano materials in any four fields. (8)