Reg. No. : | | | | | | | | | | | | |

# Question Paper Code : 57012

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2014.

First Semester

Civil Engineering

CY 6151 — ENGINEERING CHEMISTRY – I

(Common to all branches expect marine engineering)

(Regulation 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is functionality of polymers?
2. Mention any two uses of Nylon 6:6.
3. State second law of thermodynamics.
4. Define entropy.
5. What is phosphorescence?
6. What is meant by wave number?
7. What is triple point?
8. Write down the composition of nichrome.
9. What are nanowires?
10. Distinguish between bulk materials and nanomaterials.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Discuss Bulk polymerisation technique. Mention any two polymers synthesised by this technique. (8)

(ii) Write any five differences between thermoplastics and thermosetting plastics. (8)

Or

(b) (i) Explain the mechanism of free radical polymerisation. (8)

(ii) Write the preparation, properties and uses of epoxy resin. (8)

12. (a) (i) Explain the significance of free energy. (8)

(ii) Derive any one form of Gibbs-Helmholtz equation. (8)

Or

(b) (i) Compare the reversible process with the irreversible process. (8)

(ii) Derive any two Maxwell relations. (8)

13. (a) (i) Explain Fluorescence and Photo sensitization. (8)

(ii) State and explain Stark-Einstein Law. (8)

Or

(b) (i) Explain various electronic transitions occur in the spectroscopy. (8)

(ii) Explain the principle and instrumentation of UV-Visible spectroscopy with a neat block diagram. (8)

14. (a) (i) Draw a neat two component Lead - Silver system and explain. (8)

(ii) State Phase rule and explain the terms involved in it with examples. (8)

Or

(b) (i) Discuss any four heat treatment of steel in detail. (8)

(ii) Discuss the composition, properties and uses of any two ferrous alloys. (8)

15. (a) (i) Discuss any four salient properties of nanomaterials. (8)

(ii) Describe any two methods of synthesizing nanomaterials. (8)

Or

(b) (i) Discuss the size dependent properties of nanomaterials. (8)

(ii) Explain any six applications of nanomaterials in various fields. (8)

---