



Reg. No. :

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*Dywan*  
*16/11*

**Question Paper Code : 91414**

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2019  
First Semester  
Civil Engineering  
CY 6151 – ENGINEERING CHEMISTRY – I  
(Common to all branches except Marine Engineering)  
(Regulations 2013)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART – A

(10×2=20 Marks)

1. Differentiate between thermosetting and thermoplastic polymers.
2. Brief about tacticity of polymers.
3. What happens to entropy of the following :
  - a) A gaseous nitrogen is converted to liquid nitrogen.
  - b) Solid iodine is sublimed to its vapour.
4. Calculate the entropy change involved in converting one mole of water at 373 K to its vapour at the same temperature. (Molar heat of vaporisation of water =  $40.66 \text{ kJ k}^{-1} \text{ mole}^{-1}$ )
5. Differentiate between photo-chemical and thermochemical reaction.
6. What is finger print region ? Mention its important uses.
7. What is Degree of Freedom ?
8. What are the applications of Phase Diagrams ?
9. What are carbon nanotubes ?
10. What is laser ablation ?

PART – B

(5×16=80 Marks)

11. a) i) Describe the free radical mechanism of addition polymerisation with a suitable example. (8)
- ii) Write the preparation, properties and uses of
  - 1) Nylon 6, 6
  - 2) Epoxy resin. (8)

(OR)



- b) i) Explain the technique, advantages and disadvantages of
- 1) Emulsion polymerization.
  - 2) Suspension polymerization. (8)
- ii) Brief about the following properties of the polymers.
- 1) Glass Transition Temperature.
  - 2) Weight average molecular weight. (8)
12. a) i) Discuss the criteria for a spontaneous chemical reaction. (8)
- ii) Derive Van't Hoff isotherm. (8)
- (OR)
- b) i) Derive any two Maxwell's relations. (8)
- ii) Derive Gibbs-Helmholtz equation. (8)
13. a) i) Explain the instrumentation of a UV-visible spectrophotometer. (8)
- ii) What is quantum efficiency? How is it determined? (8)
- (OR)
- b) i) Explain the following :
- 1) Fluorescence (4)
  - 2) Phosphorescence. (4)
- ii) State Lambert-Beer Law. Derive its mathematical form. What are its limitations? (2+4+2)
14. a) i) Draw the phase diagram of water system and explain in detail. (8)
- ii) Draw the phase diagram of Zinc -Magnesium system and explain in detail. (8)
- (OR)
- b) i) Draw the phase diagram of lead silver system and explain in detail. (8)
- ii) What are the effects of alloying elements? Give its functions. (8)
15. a) Discuss in detail about the synthesis of carbon nano tubes. (16)
- (OR)
- b) Explain the applications of Nanoparticles.