

Reg. No. :

T 3189

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2008.

Second Semester

(Regulation 2004)

Electrical and Electronics Engineering

CY 1151 — CHEMISTRY — II

(Common to B.E. Electronics and Instrumentation Engineering and
Instrumentation and Control Engineering)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List out any two differences between photochemical and thermal reactions.
2. Define the terms chemiluminescence and bioluminescence.
3. What do you mean by T_g of a polymer? What are the structural features of a polymer that influence its T_g ?
4. Write any two important functions of a photoresist.
5. What is Pilling-Bedworth rule?
6. What type of corrosion occurs in the following cases
(a) Wire fence and (b) Riveted joints
7. What are primary and secondary cells?
8. Write any two advantages of $H_2 - O_2$ fuel cell.
9. What are the factors that affect the rate of electron transfer in homogeneous systems?
10. Name two important voltammetric sensors.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Prove that the quantum yield for the photochemical decomposition of HI is 2. (8)
- (ii) Explain the principle and procedure involved in the functioning of Fricke Dosimeter. (8)

Or

- (b) (i) What is photosensitization? Explain the mechanism of photosensitization. Give one example for a photosensitized reaction. (10)
- (ii) Explain the two stages involved in radiolysis. (6)
12. (a) (i) What are polymer blends? What are their properties? Give any two examples. (6)
- (ii) Discuss in detail about the various types of doping methods. (10)

Or

- (b) (i) How are optical fibers classified? Discuss their properties in detail. (8)
- (ii) Explain the various steps involved in the photolithographic process. (8)
13. (a) (i) Explain the mechanism of hydrogen evolution type and oxygen absorption type corrosion. (10)
- (ii) Write short notes on : (6)
- (1) Hydrogen embrittlement and
- (2) Pitting Corrosion.

Or

- (b) (i) What are corrosion inhibitors? Explain the functions of any two corrosion inhibitors giving suitable examples. (8)
- (ii) Describe the electroless copper plating process and discuss its applications. (8)

14. (a) (i) Give an account of uncontrolled fission reactions. (6)
- (ii) What is nuclear energy? What is the cause for the release of nuclear energy? Illustrate with a suitable example. (6)
- (iii) Calculate the energy released in the fission reaction. (4)



Given that the atomic mass of ${}^{235}\text{U} = 235.044$ amu, ${}^1_0\text{n} = 1.009$ amu, ${}^{98}\text{Mo} = 97.905$ amu, ${}^{136}\text{Xe} = 135.917$ amu.

Or

- (b) (i) How does a NICAD battery function? How can it be recharged? (8)
- (ii) Describe the construction and working of a solar cell. (8)
15. (a) (i) Illustrate how the electron transfer process takes place in heterogeneous systems. (10)
- (ii) Explain the assembly and functioning of a polarographic cell. (6)

Or

- (b) (i) Describe the extraction of aluminium from alumina by electro-winning process. (10)
- (ii) Give a brief account of the electrochemical machining process. (6)