6142 (N) 12/05/2014(TV)

G 594 (Pages : 3) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2014

First and Second Semesters

EN 010 103—ENGINEERING CHEMISTRY AND ENVIRONMENTAL STUDIES

(New Scheme—2010 Admission onwards—Regular/Improvement/Supplementary)

[Common for all branches]

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions briefly.*
Each question carries 3 *marks.*

1. What are strong and weak electrolytes ? Give examples.
2. What are corrosion inhibitors ? Give *two* examples.
3. Define degree of polymerisation.
4. Why is the excessive use of synthetic detergents discouraged ?
5. What are the ill-effects of photochemical smog ?

(5 × 3 = 15 marks)

Part B

Answer **all** *questions.*
Each question carries 5 *marks.*

6. Explain the construction and working of H_2—O_2 fuel cell. Mention its applications.
7. Explain the corrosion occurring in the following cases :
   (i) Deposition of small particles of dust on the surface of iron.
   (ii) Bolt and nut made from different metals are in contact with each other.
8. Define glass transition temperature. Explain the factors influencing glass transition temperature and give its significance.
9. Discuss the sources of water pollution. Define COD and BOD.
10. Mention the importance of solar cells.

(5 × 5 = 25 marks)

Turn over

Part C

Answer **all** *questions.*
Each full question carries 12 *marks.*

11. (a) What is single electrode potential ? Explain its determination using primary and secondary reference electrodes. (7 marks)

(b) Zn rod is dipped in 0.11 M $ZnSO_4$ solution at 300 K. What is single electrode potential of Zn half cell, if $E^{\circ}_{cell} = +0.762$ V. (5 marks)

Or

12. (a) What are concentration cells ? Give one example and write electrode reactions and total cell reaction. (6 marks)

(b) Explain the construction and working of lead-acid storage battery. Mention its applications. (6 marks)

13. (a) Describe galvanizing used as a method of prevention of corrosion. (6 marks)

(b) What is wet corrosion ? Explain the mechanism taking rusting of iron as example. (6 marks)

Or

14. Explain the following methods of combating corrosion with suitable examples :

(i) Use of inhibitors. (4 marks)

(ii) Use of protection coatings. (4 marks)

(iii) Material selection and design. (4 marks)

15. (a) Distinguish between Thermoplastic and Thermosetting plastic materials. (6 marks)

(b) Explain the properties and applications of single walled carbon nano tubes. (6 marks)

Or

16. (a) Describe how polyacetylene is able to function of a conducting polymer. (6 marks)

(b) How polyurethanes are obtained ? What are their properties and applications ? (6 marks)

17. (a) What are the sources of CO and SO_2 pollutants in air ? What are their causes ? How it can be cured ? (8 marks)

(b) How ammonia and fertilizers are harmful to the aquatic system ? (4 marks)

Or

18. Explain the different stages in treatment of water for domestic purposes.

19. Explain the different methods of disposal of different kinds of solid waste.

Or

20. (a) Explain biodiversity and its significance . (5 marks)

(b) What are biofuels ? Explain any *two* types and how they can be substitute to the conventional fossil fuel ?

(7 marks)

[5 × 12 = 60 marks]