Q.P. Code – 50826

Third Year B.Sc. Degree Examination

OCTOBER/NOVEMBER 2014

(Directorate of Distance Education)

(DSC 260) Paper III – CHEMISTRY

Time : 3 Hours] *[Max. Marks : 75/85*

Instructions to Candidates :

1) *This paper consists of five Sections. Answer all Sections.*

2) *Write equations and neat diagrams wherever necessary.*

3) *Section-**E** is **compulsory** for **85** marks scheme.*

SECTION – A

Answer **ALL** the following questions in a word, a phrase or in a sentence :

10 × 1 = 10

1. Mention the chief ore of nickel.

2. Mention the electrolyte used in gold electroplating.

3. Name the alloy used in measuring tapes.

4. What is a spontaneous process?

5. What is epimerisation?

6. Define the term "saponification value".

7. What is 'Isoelectric point'?

8. Mention any two fat soluble vitamins.

9. What are terpenes?

10. What are fuel cells?

SECTION – B

Answer any **FIVE** of the following : **5 × 3 = 15**

11. Explain the cleansing action of soap.

12. Give the synthesis of citral.

13. Explain the general methods of isolation techniques for alkaloids from plants.

14. What is mutarotation? Explain its mechanism.

15. Explain asymmetric effect.

16. Discuss the advantages and disadvantages of liquid ammonia as solvent.

17. Discuss the influence of the following elements on the properties of steel. (i) Carbon (ii) Manganese (iii) Chromium.

SECTION – C

Answer any **FIVE** of the following : **5 × 6 = 30**

18. (a) Derive Gibb's-Helmholtz equation in terms of free energy and enthalpy change at constant pressure.

    (b) Two moles of an ideal gas is compressed isothermally and reversibly from a volume 100 dm^3 to 5 dm^3 at 300 K. Calculate the free energy change. **4 + 2**

19. (a) Describe construction and working of calomel electrode.

    (b) Define (i) single electrode potential (ii) reference electrodes. **4 + 2**

20. (a) Discuss the synthesis of ascorbic acid from D-Glucose.

    (b) Give a brief account of oxido reductases. **4 + 2**

21. (a) How are proteins classified based on their composition? Explain with examples.

    (b) Write the structure of (i) aspartic acid (ii) lysine. **4 + 2**

22. (a) Explain the biochemical functions of fat soluble and water soluble vitamins.

    (b) Explain a chemical reaction to prove the presence of –CHO group in citral. **4 + 2**

23. (a) How is manganese extracted from pyrolusite?

    (b) How are alloys prepared by powder metallurgy? **4 + 2**

24. (a) Explain the principles involved in the potentiometric titration of a strong acid against a strong base.

    (b) Give the importance of fuel cells. **4 + 2**

SECTION – D

Answer any **TWO** of the following : **2 × 10 = 20**

25. (a) Explain the characteristic features of Ellingham diagrams for oxides. **4**

    (b) Give a brief account on quartation process. **2**

    (c) Describe the procedure for the recovery of silver from photography plate. **4**

26. (a) What are refractories? How are they classified? Give examples.

    (b) Discuss the factors influencing nature of electrodeposition.

    (c) Explain (i) solvolysis (ii) redox reactions in water and liq. NH_3. **3 + 3 + 4**

27. (a) Discuss the factors affecting the rates of enzyme catalysed reaction.

    (b) Explain (i) Strecker synthesis (ii) Gabriel synthesis.

    (c) Define the terms (i) equivalent conductance (ii) specific conductance (iii) liquid junction potential. **3 + 4 + 3**

SECTION – E

Compulsory Question for **85** marks scheme only :

Answer any **ONE** of the following : **1 × 10 = 10**

28. (a) What are soaps? How is soap manufactured by hot process? **5**

(b) Elucidate the structure of NICOTINE. **5**

29. (a) Discuss the extraction of uranium from pitch blende. **4**

(b) State and explain Kohlrausch's law. **2**

(c) Discuss the solubility of ionic solids on the basis of lattice energy and solvation energy. **4**