STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI-86
(For candidates admitted during the academic year 2010–11)

SUBJECT CODE: CH/AC/GC33

B.Sc. DEGREE EXAMINATION, NOVEMBER 2011
BRANCH III - PHYSICS
THIRD SEMESTER

REG.NO ……..

COURSE : ALLIED CORE
PAPER : GENERAL CHEMISTRY- I
TIME : 30 MINUTES **MAX.MARKS : 20**

SECTION – A (20x1=20)

Answer all questions

Answer on the question paper itself:

I. Choose the correct answer:

1. The number of asymmetric centers in fructose
   a) 1 b) 2 c) 3 d) 4

2. The coordination number of K^+ and Cl^- in KCl crystal is
   a) 1:1 b) 2:2 c) 6:6 d) 8:8

3. On dilution specific conductance
   a) increases b) decreases c) remains unchanged d) fluctuates

4. The colour given by proteins when subjected to ninhydrin test is
   a) red b) blue c) orange d) purple

II. Fill in the blanks:

5. In the structure of CsCl each Cs^+ ion is surrounded by _____ chloride ions.
6. The unit of equivalent conductance is _____.
7. Sucrose on hydrolysis yields _____.
8. The metal ion present in vitamin B_{12} is _____.

III. State whether the following are true or false:

9. The nitrogenous bases in nucleic acids are held together by hydrogen bonds.
10. Calcium is the metal ion present in chlorophyll.
11. Fructose is a reducing sugar.
12. EDTA is a bidentate ligand.

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IV. Match the following:

13. Chelates	-	Co
14. Calomel electrode	-	Fe
15. Hydrogen electrode	-	Hg
16. Haemoglobin	-	Pt
	-	ring structure

V. Answer in a line or two:

17. Define space lattice.

18. What is meant by the term corrosion?

19. What is the most important function of DNA?

20. What are ligands?

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TIME : 2 HOURS **MAX.MARKS : 80**

SECTION – B

ANSWER ANY FOUR QUESTIONS : **4X10=40**

1. a. Describe the structure of sodium chloride crystal. (5)
   b. What are Miller indices? How are they useful in describing a crystal plane? (5)

2. a. Discuss hexagonal close packing in crystals. (4)
   b. How is the number of atoms in (i) FCC and (ii) BCC crystals determined? (6)

3. a. Explain Ostwald's dilution law. (5)
   b. Draw and explain the working of a lead storage battery. (5)

4. a. What is the effect of dilution on equivalent conductance and molar conductance? (5)
   b. State Kohlrausch's law and explain how it is used to determine equivalent conductance at infinite dilution of weak electrolytes. (5)

5. a. What are carbohydrates? How are they classified? (7)
   b. Draw the Haworth structure of glucose. (3)

6. a. What are the types of RNA? List their functions. (7)
   b. What is meant by isoelectric point? (3)

7. a. Explain any two colour tests for carbohydrates. (4)
   b. Give the structure of chlorophyll. What is the role of chlorophyll in living systems ? (6)

SECTION – C **2X20=40**

ANSWER ANY TWO QUESTIONS:

8. a. What are the types of liquid crystals? Describe their structure and properties. (12)
   b. Describe the structure of (i) diamond (ii) graphite (8)

9. a. Discuss Debye-Huckel theory. (10)
   b. Explain how the conductometric titration of a strong acid Vs. strong base and weak acid vs. strong base carried out? Draw and explain the curves obtained for the titrations. (10)

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10. a. Describe the structure of DNA with a neat diagram. (12)
    b. Discuss (i) hypo glycemia (ii) hyper glycemia (8)

11. a. How are peptides formed? (3)
    b. What are zwitter ions? Why do amino acids exist as zwitter ions? (3)
    c. What are buffers? How does the bicarbonate buffer system support living organisms? (7)
    d. Discuss the role of haemoglobin in living systems? (7)