D 3054 **(Pages 3)** **Name.....**

Reg. No.....

FIRST SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2009

Complementary Course—Chemistry

CH IC 01—GENERAL CHEMISTRY

(C.S.S. Programme)

Time : Three Hours Maximum Weightage : 30

I. Answer *all* 12 questions. Each question carries a weightage of 1/4. There are multiple choice questions, fill up the blank questions and one word answer questions in this part :

Which of the following is NOT a segment of the environment ?

(a) Atmosphere. (b) Hydrosphere.

(c) Lithosphere. **(d)** Stratosphere.

2 the bond order of NO molecule is :

(a) 1. (b) 1.5.

(c) 2. **(d)** 2.5.

The metal present in Vitamin **B_{12} is** :

(a) Cobalt. (b) Zinc.

(c) Iron. **(d)** Magnesium.

4 The group reagent in the **III** group of qualitative analysis is :

(a) dil.HCl. (b) dil HCl and H_2S.

(c) NH_4Cl and NH_4OH. (d) NH_4OH and $(NH_4)_2CO_3$.

5 Which of the following is a Lewis acid ?

(a) H_2O. (b) NH_3.

(c) BF_3. (d) $AlCl_4^-$.

6 The medium which retains and interacts with a longlived pollutant is called ————

7 The energy required to break one mole of a compound into its constituent ions in the gaseous state is called ————

8 The protein part of haemoglobin is ————

Turn over

9 In paper chromatography, the separation of components is effected by _____

10 Agreement between two analytical values is called _____

11 Give the general term used to denote the material which does not occur in nature, but introduced by human activity.

12 What is the shape of SF_4 molecule ?

(12 x ¼ = 3 weightage)

II. Answer *all* the 9 questions. Each question carries 1 weightage :

13 Mention the important regions of the atmosphere.

14 Define BOD and COD.

15 What is the role of ozone in protecting the earth ?

16 State and explain the uncertainty principle.

17 Give the molecular orbital electronic configuration of C_2 molecule and calculate the bond order.

18 Sketch the shapes of the p_x and d_{xy} orbitals.

19 What is Photosynthesis ?

20 Explain the action of phenolphthalein as an acid base indicator.

21 Define R_f value. Mention its use.

(9 x 1 = 9 weightage)

III. Answer any *five* questions, each in a paragraph. Each question carries 2 weightage :

22 Discuss the carbon cycle and its importance.

23 What is Green house effect ? Explain the reasons for Green house effect. Suggest solutions for the same.

24 Explain the Born-Haber cycle and discuss its applications.

25 Outline the VSEPR theory. Explain the shapes of NH_4+ and PF_5 on its basis.

26 Explain how a pipette can be calibrated.

27 Discuss the Bronsted-Lowry concept of acids and bases with suitable examples.

28 Explain column chromatography with special reference to preparation of the column, principle involved and elution process.

(5 x 2 = 10 weightage)

IV. Answer any *two* questions. Each question has a weightage of 4 :

29 (a) What is acid rain ? Discuss its consequences.

(b) Calculate the wavelength associated with an electron having a mass of 9.1×10^{-31} kg and accelerated by a potential difference of 1000 V. Charge of the electron is $1.6_0 \times 10^{-19}$ C.

30 Discuss the role of haemoglobin and myoglobin in biological systems.

31 Explain the use of solubility product and common ion effect in the separation of (a) II group and IV group cations and (b) III group and IV group cations in qualitative analysis.

(2 x 4 = 8 weightage)