

FIRST SEMESTER B.Sc. DEGREE EXAMINATION, JANUARY 2014

(UG-CCSS)

Complementary Course—Chemistry

CH IC 01—GENERAL CHEMISTRY

Time : Three Hours

Maximum : 30 Weightage

I. Answer all the *twelve* questions. Each question carries a weightage . This section contains multiple choice, fill in the blanks and *one* word answer questions :

1. Which among the following is not a component of natural environment ?

- (a) Wild life. (b) Forests.
(c) Dams. (d) Soil.

2. Which of the following is not a green house gas ?

- (a) CO_2 . (b) CO .
(c) CH_4 . (d) O_3 .

3. Which combination of quantum numbers is not permitted for an electron in an atom ?

- (a) $n = 1, l = 0, m = 0, s = \frac{1}{2}$.
(b) $n = 3, l = 1, m = 0, s = \frac{1}{2}$.
(c) $n = 3, l = 1, m = -2, s = -\frac{1}{2}$.
(d) $n = 4, l = 3, m = 2, s = \frac{1}{2}$.

4. A molecule with distorted geometry is :

- (a) BF_3 . (b) CH_4 .
(c) ClF_3 . (d) PCl_5 .

5. Methyl orange is used in the titration of :

- (a) NaOH and HCl . (b) NaOH and Oxalic acid.
(c) Na_2CO_3 and HCl . (d) Both (a) and (c).

6. In adsorption chromatography the mobile phase is a :

- (a) Solid. (b) Liquid.
(c) Gas. (d) Liquid *or* Gas.

7. Ozone gas is found mainly in _____ region of atmosphere.

Turn over

8. **BOD** stands for _____
9. The de Broglie relation is _____
10. The 'p' orbitals have _____ shape.
11. According to **Bronsted**, acids are _____
12. Name the metal present in chlorophyll.

(12 x 1 = 12 weights)

II. Answer all the *nine* questions. Each question carries a **weightage** 1.

13. Name the major segments of the environment.
14. Write any *two* consequences of ozone depletion.
15. Which are the major air pollutants emitted by automobiles ?
16. State Heisenberg's Uncertainty principle.
17. Name any *two* **metalloporphyrins**.
18. Write any *two* points to distinguish between photosynthesis and respiration.
19. Differentiate between precision and accuracy of a measurement.
20. What is a Lewis acid ? Give example.
21. What is elution ?

(9 x 1 = 9 weightage)

III. Answer any *five* questions. Each question carries a **weightage** 2.

22. Distinguish between **biomagnification** and **bioaccumulation**.
23. How is lattice energy of a compound determined ?
24. Explain **sp^3d** and **sp^3d^2** hybridisations with suitable examples.
25. Write briefly on sodium potassium pump.
26. Explain the important functions of haemoglobin
27. Write the **Ostwald** theory of acid-base indicators
28. What are the important applications of ion exchange chromatography ?

(5 x 2 = 10 weightage)

Answer any *two* questions. Each question carries a weightage 4.

29. Write briefly on :

- (a) Chemical Oxygen Demand.
- (b) Hydrological cycle.
- (c) Acid rain.

30. (a) State and explain VSEPR theory.

(b) Write the MO configuration of N_2 molecule and calculate the bond order.

31. Explain the different types of errors in analytical measurements and suggest methods to minimise them.

(2 x 4 = 8 weightage)