D 32468 (Pages : 2) Name.....

Reg. No.....

FIRST SEMESTER B.Sc. DEGREE EXAMINATION, JANUARY 2013

(CCSS)

Chemistry

CH IB 01—FOUNDATIONS IN CHEMISTRY

Time : Three Hours Maximum : 30 Weightage

I. Answer *all* twelve questions. Each question has a weightage of ¼. This part contains multiple choice, fill in the blank and one word answer questions :

1 Scientific data can be represented by using:

(a) Tables. (b) Graphs.

(c) Diagrams. (d) All the above.

2 Which of the following forms a criterion of purity of organic compound :

(a) Molecular mass. (b) Empirical mass.

(c) Melting and boiling points. (d) Solubility.

3 Which element of 2nd period forms most acidic oxide :

(a) Fluorine. (b) Nitrogen.

(c) Boron. (d) Carbon.

4 A theory is an explanation for proven _____ and so it is accepted by the scientific fraternity.

(a) Hypothesis. (b) Document.

(c) Observation. (d) Knowledge.

5 Bohr's model of atom is not in agreement with :

(a) Line spectrum of hydrogen atom.

(b) Pauli's exclusion principle.

(c) Plank's theory.

(d) Heisenberg's uncertainty principle.

6 The subatomic particles responsible for keeping the nucleons together in a nucleus :

(a) Meson. (b) Nutrino.

(c) Positron. (d) Neutron.

7 Which of the following has maximum ionization power :

(a) a-rays. (b) 0-rays.

(c) y-rays. (d) X-rays.

Turn over

8 The material used for absorbing nuetrons in a nuclear reactor is :

(a) Cd. (b) Ra.

(c) U. (d) Zn.

9 $_{94}Pu^{241}$ + 13.

10 The generalization of observed facts is called.

11 Chemical substances which are utilized as medicines to lower body temperature are called.

12 Drugs which produce sleep and reduce anxiety are.

(12 x $^1/_4$ = 3 weightage)

II. Answer *all* nine questions. Each question has a weightage of 1. Answers may be in one sentence *or* two :

13 The half-life period of a radioactive element is 5 days. Calculate the decay constant.

14 Which is group displacement law ?

15 What is the principle of hydrogen bomb ?

16 Ca^{+} ion is smaller than Ca atom. Why ?

17 Why tritium is radioactive but not deuterium ?

18 Electron affinities of noble gases are zero. Why ?

19 The beach sand of Kerala contains the ore of an important element which can be used in nuclear power generations. Identify the element and the ore.

20 Beryllium and Nitrogen of the second period of periodic table have slightly higher ionization energy than expected. Why ?

21 How a scientific theory is different from hypothesis ?

(9 X 1 = 9 weightage)

III. Answer any *five* questions. Each question has a weightage of 2. Answers may be in a *paragraph* :

22 Detergents are preferred for the cleansing of clothes to soaps in hard water. Why ?

23 Briefly explain the Aston's mass spectrograph.

24 With the help of suitbale example mention the geometrical isomerism shown by organic compounds.

25 Discuss the anomalous behaviuor of Be.

26 Define binding energy. Calculate the binding energy/nucleon of the helium atom. Mass of $_2He^4$ nuclei is 4.0026 amu. Mass of neutron = 1.008665 amu, Mass of proton = 1.007277 amu.

27 Discuss the importance of chemical science to the service of men taking fertilizers as an example.

28 Explain why the ionization energy of the transition elements is reasonably constant.

(5 x 2 = 10 weightage)

IV. Answer any *two* questions. Each question has a weightage of 2 :

29 Explain the application of radioisotopes.

30 Briefly describe the steps involved in the development of theory from observations.

31 Brifefly explain how the technological development enhances the living standards of hu beings.

(2 X 4 = 8 weightag