

**B.Sc. DEGREE (C.B.C.S.S.) EXAMINATION, MARCH 2016****Sixth Semester****Core Course—APPLIED INORGANIC CHEMISTRY**

(Prior to 2013 Admissions)

[Common for B.Sc. Chemistry Model I, Model II, B.Sc. Petrochemicals and B.Sc. Chemistry Environment and Water Management]

Time : Three Hours

Maximum Weight : 25

**Section A***Answer all questions.*

I. Choose the correct answer. A bunch of four questions carries a weight of 1 :

1  $R_f$  value is always :

- (a) Greater than one.                      (b) One.  
(c) Less than one.                         (d) Can be anything.

2 Zone refining is used for getting highly pure :

- (a) Germanium.                              (b) Carbon.  
(c) Titanium.                                 (d) Lead.

3 Group reagent for IV cation analysis is :

- (a)  $(\text{NH}_4)_2\text{CO}_3$  and  $\text{NH}_4\text{OH}$ .                      (b) Dil HCl and  $\text{H}_2\text{S}$ .  
(c)  $\text{NH}_4\text{Cl}$  and  $\text{NH}_4\text{OH}$ .                         (d)  $\text{NH}_4\text{Cl}$ ,  $\text{NH}_4\text{OH}$  and  $\text{H}_2\text{S}$ .

4 Nuclear fusion reaction is used in \_\_\_\_\_.

- (a) Hydrogen bomb.                         (b) Atom bomb.  
(c) Nuclear reactor.                         (d) All the above.

II. 5 Spot test for  $\text{Al}^{3+}$  ion is done by :

- (a) Alizarin.                                      (b) Rhodamine B. reagent.  
(c) Magneson reagent.                         (d) Dimethyl glyoxime.

6 Hydrometallurgy is used for the extraction of \_\_\_\_\_.

- (a) Ag.    (b) Cu.  
(c) Zn.    (d) Cr.

Turn over

7 Which of the following is used as control rod in nuclear reactor ?

- (a) Graphite. (b) Platinum.  
(c) Cadmium. (d) Nickel.

8 A compound gets precipitated when ?

- (a) Its ionic product exceeds solubility product.  
(b) Its solubility product exceeds ionic product.  
(c) Ionic product is equal to solubility product.  
(d) None of the above.

III. Fill in the blanks :

9 Teflon is chemically \_\_\_\_\_.

10  $\text{XeOF}_4$  has \_\_\_\_\_ Geometry ( $\text{XeOF}_4$ ).

11 Zeolites are \_\_\_\_\_.

12 Main constituents in ordinary glass are \_\_\_\_\_.

IV. 13 Inorganic Benzene is \_\_\_\_\_.

14 Nessler's reagent is chemically \_\_\_\_\_.

15 Glass transition temperature is defined as \_\_\_\_\_.

16 The auto ionization reaction of liquid  $\text{SO}_2$  is \_\_\_\_\_.

(4 × 1 = 4)

### Section B

Answer any five questions.

Each question carries a weight of 1.

17 Explain Van Arkel process.

18 What is rock dating ? Explain the principle involved in it.

19 How is Fluoride eliminated in Qualitative analysis ? Why is it necessary to eliminate Fluoride ?

20 What are Breeder reactors ?

21 What is Silicone rubber ? How is it prepared ?

22 Give three reactions to show the electropositive character of Iodine.

23 What are Carbon Nanotubes ? Explain.

24 Discuss the structure of  $\text{XeO}_3$  molecule.

(5 × 1 = 5)

**Section C**

*Answer any four questions.*

*Each question carries a weight of 1.*

- 25 Explain the extractive metallurgy of Titanium from its ore.
- 26 Give a short account on activation analysis and its applications.
- 27 What is Ellingham diagram ? Discuss its applications.
- 28 Explain the structure and bonding in diborane.
- 29 Discuss the principle of differential thermal analysis. Give one of its applications.
- 30 What are the advantages of liquid HF as a solvent ?

(4 × 2 = 8)

**Section D**

*Answer any two questions.*

*Each question carries a weight of 4.*

- 31 Write briefly on different techniques used for nanomaterial synthesis.
- 32 Write briefly on :
  - (i) Refractory carbides.
  - (ii) Different types of silicates.
- 33 Give a brief account of the following specifying their applications :
  - (a) HPLC.
  - (b) Paper chromatography.

(2 × 4 = 8)