

(6 pages)

Reg. No. : .....

Code No. : 30477 E Sub. Code : CMCH 41

B.Sc. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2024

Fourth Semester

Chemistry — Core

INORGANIC CHEMISTRY — II

(For those who joined in July 2021 and 2022 only)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer.

1. Dimethyl sulphoxide is a \_\_\_\_\_.  
(a) Non-polar solvent  
(b) Protic solvent  
(c) Polar protic solvent  
(d) Dipolar aprotic solvent
2. Which of the following is amphoteric solvent?  
(a) Pyridine (b) Ether  
(c) Water (d) Liquid ammonia

3. Most of the compounds of transition metals are coloured in the \_\_\_\_\_ or in the solution states.  
(a) liquid (b) solid  
(c) semi-solid (d) plasma
4. The  $\text{La}^{3+}$ ,  $\text{Lu}^{3+}$ ,  $\text{Ce}^{4+}$  and  $\text{Yb}^{2+}$  ions which have  $4f^0$  or  $4f^{14}$  electronic configurations are \_\_\_\_\_.  
(a) Paramagnetic (b) Ferromagnetic  
(c) Diamagnetic (d) Anti-ferromagnetic
5. The removal of "Gangve" from a ore is called \_\_\_\_\_.  
(a) Ore reduction (b) Smelting  
(c) Ore-concentration (d) Zone-refining
6. Pyrolusite is an ore of \_\_\_\_\_.  
(a) Zirconium (b) Manganese  
(c) Titanium (d) Cobalt
7. The hybridisation in  $\text{ClF}$  molecule is \_\_\_\_\_.  
(a) sp (b)  $\text{sp}^2$   
(c)  $\text{sp}^3$  (d)  $\text{dsp}^2$

8. The shape of  $\text{XeF}_6$  is \_\_\_\_\_.
- (a) Pyramidal  
(b) Tetrahedral  
(c) Distorted octahedral  
(d) Linear
9. Numerical difference between the measured value and true value is \_\_\_\_\_.
- (a) absolute error      (b) relative error  
(c) percentage error    (d) none of these
10. 0.00310 has \_\_\_\_\_ significant numbers.
- (a) 4                      (b) 3  
(c) 2                      (d) 5

PART B — (5 × 5 = 25 marks)

Answer ALL questions choosing either (a) or (b).  
Each answer should not exceed 250 words.

11. (a) Discuss the Lux-Flood concept of acids and bases.
- Or
- (b) What are polar solvents and non-polar solvents? Give two examples for each solvent.

Page 3    Code No. : 30477 E

12. (a) Explain the oxidation state of Lanthanides.
- Or
- (b) Write short notes on the catalytic properties of d-block elements.
13. (a) How is chromium extracted from its ore?
- Or
- (b) Explain the magnetic separation with an example.
14. (a) Write a note on  $\text{BrF}_3$  interhalogen compound.
- Or
- (b) Give any two preparations for
- (i) Cyanogen  
(ii) Thiocyanagen.
15. (a) Explain Precision and Accuracy.
- Or
- (b) Discuss the normal law of distribution of random errors.

Page 4    Code No. : 30477 E  
[P.T.O.]

PART C — (5 × 8 = 40 marks)

Answer ALL questions choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Discuss the role of liquid ammonia as a solvent.

Or

- (b) Explain in detail the Brønsted-Lowry concept of acids and bases.

17. (a) Explain the following for the d-block elements :

- (i) Density
- (ii) Magnetic properties
- (iii) Colour.

Or

- (b) Give an account of lanthanide contraction and its consequences.

18. (a) Explain

- (i) Van-Arkel Process
- (ii) Zone-refining.

Or

- (b) Give any three uses for the following metals :

- (i) Cr
- (ii) Mn
- (iii) Zr.

Page 5 Code No. : 30477 E

19. (a) Give an account of Clathrates.

Or

- (b) Write the structure and shape of the Xenon compounds.

- (i)  $\text{XeF}_2$
- (ii)  $\text{XeF}_4$
- (iii)  $\text{XeOF}_4$
- (iv)  $\text{XeOF}_2$

20. (a) Write a brief account on the classification of errors.

Or

- (b) Explain :

- (i) F-Test
- (ii) Mean
- (iii) Range.

Page 6 Code No. : 30477 E