

2019/TDC/ODD/SEM/CHMHCC-301T/133

TDC (CBCS) Odd Semester Exam., 2019

CHEMISTRY

(3rd Semester)

Course No. : CHMHCC-301 T

(s-, p-Block Elements and Metallurgy)

Full Marks : 50

Pass Marks : 20

Time : 3 hours

*The figures in the margin indicate full marks
for the questions*

PART—A

(Marks : 20)

Answer **ten** questions, taking **two**
from each Unit

UNIT—I

1. (a) Define catenation. Cite one example.

$1\frac{1}{2}+1\frac{1}{2}=2$

(b) Phosphine has lower boiling point than ammonia. Explain.

2

(c) Draw the structure of P_4O_{10} . Mention the number of P—O bonds in it. $1\frac{1}{2}+1\frac{1}{2}=2$

20J/1166

(Turn Over)



UNIT—II

2. (a) Mention one use of each, helium (He) and argon (Ar). 1+1=2
- (b) How does Ar originate in air? Discuss the isolation of Ar from N_2/O_2 mixture. 1+1=2
- (c) Name the noble gas which is—
(i) most abundant in atmosphere;
(ii) radioactive. 1+1=2

UNIT—III

3. (a) What are the limitations of Brönsted-Lowry theory of acids and bases? 2
- (b) Identify the stronger Lewis acid among Na^+ and Ag^+ and justify it. 2
- (c) Write the conjugate acid of the base HS^- and the conjugate base of the acid HSO_4^- . 1+1=2

UNIT—IV

4. (a) Define inorganic polymers. Mention the basic differences between organic and inorganic polymers. 1+1=2

(3)

- (b) Write the properties of inorganic polymers. 2
- (c) Write a short note on 'siloxane polymers'. 2

UNIT—V

5. (a) Write the features of Ellingham diagrams. 2
- (b) Mention the principle of electrolytic refining. 2
- (c) What is hydrometallurgy? 2

PART—B

(Marks : 30)

Answer **five** questions, taking **one** from each Unit

UNIT—I

6. (a) What is inert-pair effect? 1
- (b) Draw the structure of H_3BO_3 . How does it react with ethanol? $1\frac{1}{2}+1\frac{1}{2}=3$
- (c) What are the different oxoacids of chlorine? Arrange them in the increasing order of acid strength. $1+1=2$

20J/1166

(Turn Over)



7. (a) Define diagonal relationship considering the example of Li and Mg. 2
- (b) What are different types of interhalogen compounds? Give examples. 2
- (c) Illustrate with explanation the shape of ICl_4^- species. 2

UNIT—II

8. (a) How can a mixture sample of noble gases be isolated from air? 3
- (b) Write with the equation, the preparation of oxides and fluorides of Xe (VI). Draw its structure. 2+1=3
9. (a) How can XeO_3 and XeOF_4 be prepared? What are their structures? 2+1=3
- (b) Explain the structures of XeF_4 and XeF_6 following VSEPR theory. $1\frac{1}{2}+1\frac{1}{2}=3$

UNIT—III

10. (a) Discuss Brönsted-Lowry theory of acids and bases with suitable examples. 3
- (b) What is HSAB principle? Explain why AgI_2^- is stable but AgF_2^- is non-existence. 1+2=3

11. (a) What is solvent levelling? Explain with suitable examples. 1+2=3
- (b) What are hard and soft acids and bases? Give suitable examples. 3

UNIT—IV

12. (a) What are silicates? Draw the structure of silicates. Why are they so important? 1+1+1=3
- (b) Cite an example of cross-linked silicones. Draw its structure and mention one use of it. 1+1+1=3
13. (a) Briefly describe the silicones, their general formula and one characteristic property. 1+1+1=3
- (b) What is inorganic benzene? Draw its structure and make an analogy with benzene. 1+1+1=3

UNIT—V

14. (a) What are Ellingham diagrams? Mention the uses of Ellingham diagram. $1\frac{1}{2}+1\frac{1}{2}=3$
- (b) How are metals refined by electrolytic process? 3

15. (a) Which metal is extracted by hydrometallurgy? Why hydrometallurgy cannot extract zinc? 1+2=3
- (b) Explain zone refining method for purification of metals. 3
