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H – 2089

Reg. No. : .....

Name : .....

First Semester B.Sc. Degree Examination, November 2019

First Degree Programme under CBCSS

Chemistry

Core Course – I

CH 1141 – INORGANIC CHEMISTRY – I

(2017 Admission onwards)

Time : 3 Hours

Max. Marks : 80

PART – A

Answer **all** questions in one word/one sentence. Each question carries **1** mark.

1. Total number of orbitals in third shell of an atom is \_\_\_\_\_
2.  $\text{Fe}^{3+}$  ion is more stable than  $\text{Fe}^{2+}$  ion. Why?
3. What is nascent hydrogen?
4. When superheated steam is passed over heated coke at temperatures varying from  $440^\circ\text{C}$  -  $600^\circ\text{C}$ , \_\_\_\_\_ is obtained.
5. What is the action of Lithium with dilute  $\text{H}_2\text{SO}_4$ ?
6. \_\_\_\_\_ is the heaviest of alkali metals.

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7. The theory defines acids and bases in terms of their tendency to donate or accept a proton.
8. \_\_\_\_\_ is an example for an aprotic nonaqueous solvent.
9. Give the names of two green house gases.
10. Write any one harmful effect of pesticides

(10 × 1 = 10 Marks)

#### PART – B

Answer **any eight** questions. Each question carries **2** mark.

11. What is the wavelength of an electron moving at  $5.31 \times 10^6$  m/sec? (mass of electron =  $9.11 \times 10^{-31}$  kg,  $h = 6.626 \times 10^{-34}$  J.s)
12. What is Hund's rule? Explain with example.
13. What are the different isotopes of hydrogen? Draw their atomic structures.
14. How is para hydrogen prepared? What is the ratio of ortho to para hydrogen at 300K?
15. Ionisation energy decreases on moving from lithium towards cesium. Why?
16. What are gypsum and plaster of paris?
17. Write a note on hydrogen as a next generation fuel.
18. Explain HSAB principle.
19. Write the equations showing the self ionisations of liquid  $\text{NH}_3$  and liquid  $\text{SO}_2$ .
20. Write a note on acid rain
21. What are the harmful effects of fireworks?
22. Explain how detergents cause water pollution.

(8 × 2 = 16 Marks)

### PART – C

Answer **any six** questions. Each question carries **4** mark.

23. State and explain Heisenberg's uncertainty principle.
24. Write Schrodinger wave equation. What are the significances of wave function?
25. Explain Bosch process for preparation of hydrogen.
26. What is the role of ion exchange resins in water treatment?
27. Explain the action of alkali metals in liquid ammonia.
28. Write a note on leveling effect with examples.
29. Explain the preparation and properties of calcium hydroxide.
30. Write any four methods to control air pollution.
31. What is photochemical smog? Explain.

**(6 × 4 = 24 Marks)**

### PART – D

Answer **any two** questions. Each question carries **15** mark.

32. (a) What are quantum numbers? Explain. (6)  
(b) State the rules used to write the electronic configuration for an atom. (6)  
(c) Write a note on dual nature of electrons. (3)
33. (a) Explain electrodialysis for water treatment. (6)  
(b) Distinguish between temporary and permanent hardness. (4)  
(c) Discuss the uses of the three isotopes of hydrogen. (5)