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First Semester B.Sc. Degree Examination, August 2021

First Degree Programme under CBCSS

Chemistry

Core Course I

CH 1141 – INORGANIC CHEMISTRY - I

(2017-2019 Admission)

Time : 3 Hours Max. Marks : 80

SECTION – A

(Answer **all** questions in **one** word/one sentences. **Each** question carries **1** mark.)

1. Show the distribution of electrons in nitrogen atom (at. No. 7) using orbital diagram.

2. Explain why the electronic configuration of Cu is $3d^{10}\ 4s^1$ and not $3d^2\ 4s^2$.

3. What is water gas?

4. _____ is used for slowing down the fast moving neutrons.

5. The melting points of alkali metals _____ with increase in atomic number.

6. Potassium salts impart a _____ colouration when introduced into Bunsen flame.

7. _____ is an example for an aprotic non aqueous solvent.

8. Write one harmful effect of CO.

P.T.O.

9. Name two gases that are mainly responsible for acid rain?

10. The pollutant _____ is formed by the incomplete combustion of fuels.

(10 × 1 = 10 Marks)

SECTION – B

(Answer any **eight** questions. **Each** question carries **2** marks)

11. Calculate the de Broglie wavelength of an electron moving with a velocity of 5.0×10^5 ms^{-1}.

12. For an orbital with Principal quantum number $n=3$, write down all the possible values of azimuthal quantum numbers and the magnetic quantum numbers for each.

13. Write one method (with equation) for producing tritium.

14. What do you mean by hardness of water? How will you remove temporary hardness?

15. Write any two uses of alkali metals.

16. What is the gradation in reducing action and basic character of hydroxides of alkaline earth metals on going down the group?

17. Write any two uses of lithium compounds.

18. Explain reverse osmosis Process for water purification.

19. Explain the effect of alkali metals in liquid ammonia.

20. Write any two methods for controlling water pollution.

21. What are the harmful effects of fireworks?

22. Write note on agricultural pollutants.

(8 × 2 = 16 Marks)

SECTION – C

(Answer any **six** questions. **Each** question carries **4** marks).

23. Draw the shapes of s, p and d orbitals.
24. What is electronegativity? Explain Allred- Rochow scale.
25. Discuss the position of hydrogen in the periodic table.
26. What are ortho and para hydrogen? How the ratio vary with temperature?
27. Compare the solubilities of hydroxides and sulphates of alkaline earth metals.
28. Differentiate between classical of photochemical Smog.
29. State and explain Lowry - Bronsted and Lewis concept of acids and bases.
30. What are CFCs? Why are they considered as pollutants?
31. Write a note on sources and effects of soil pollution due to urbanisation

(6 × 4 = 24 Marks)

SECTION – D

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

32. Write notes on (a) Pauling's and Mulliken's electronegativity scales. (b) Hydrogen bonding (c) Classification of elements in the periodic table. (3 x 5)
33. What is heavy water? Explain in detail the different methods for preparation of heavy water and any two chemical properties and uses.
34. Write an essay on the manufacture of cement and its setting reactions.
35. Explain (a) Ozone depletion, (b) COD and BOD, (c) Photochemical smog. Give equations of reactions wherever necessary. (3 x 5)

(2 × 15 = 30 Marks)