

FIRST YEAR HIGHER SECONDARY SAMPLE QUESTION PAPER

CHEMISTRY

Maximum: 60 Scores

Time: 2 Hours

General Instructions to Candidates:

- There is a 'Cool off time' of 15 minutes in addition to the writing time.
- Read questions carefully before answering.
- Calculations, figures and graphs should be shown in the answer sheet itself
- Give equations wherever necessary

Answer any 4 questions from 1 to 5. Each carries 1 score.

(4x1=4)

1. Write the name of the scientist who proposed the law of multiple proportions.
2. The geometry of SF₆ molecule is
3. Write the designations for orbital with quantum number n=2, l=0.
4. The conjugate acid of H₂O is
5. $2\text{CH}_3\text{Br} + 2\text{Na} \xrightarrow{\text{Dry ether}} \dots\dots\dots + 2\text{NaBr}$

Answer any 8 questions from 6 to 15. Each carries 2 score.

(8x2=16)

6. Give the empirical formula of the following :
C₆H₁₂O₆, C₆H₆, CH₃COOH, C₆H₆Cl₆
7. Who proposed modern periodic law? State the law.
8. Based on VSEPR Theory predict the shape of H₂O and NH₃
9. Distinguish between intensive and extensive properties with suitable examples.
10. Illustrate the common ion effect with an example.
11. Calculate the oxidation number of Cr in K₂Cr₂O₇.
12. Give the IUPAC names of the following compounds
 - a) $\text{CH}_3\text{-CH}_2\text{-}\underset{\text{OH}}{\text{CH}}\text{-CH}_2\text{-CHO}$
 - b) $\text{CH}_3\text{-CH=CH-CH}_2\text{-C}\equiv\text{C-CH}_3$
13. Distinguish homolytic and heterolytic fission.
14. Explain geometrical isomerism taking 2-butene as an example.
15. Explain nucleophiles and electrophiles with suitable examples.

Answer any 8 questions from 16 to 26. Each carries 3 score.

(8x3=24)

16. Calculate the mass of chlorine required to react with 0.20g of hydrogen to yield HCl. Also calculate the amount of HCl formed.

17. State the rules behind the electronic configuration in an atom
18. a) What is meant by isoelectronic species?
- b) Select isoelectronic species from the following
- N, O₂, F⁻, Mg²⁺, Al³⁺, Na⁺
19. a) State Heisenberg's uncertainty principle
- b) Calculate the uncertainty in the velocity of a cricket ball of mass 130g, if the uncertainty in its position is of the order of 1.2Å.
20. Account for the following
- a) Ionisation enthalpy of N is greater than that of O
- b) Second period elements show anomalous behavior
21. a) Give the Arrhenius concept about acids and bases
- b) Give one example each for Arrhenius acid and base
22. State and explain Hess's law of constant heat summation.
23. Represent Sawhorse and Newman projections of staggered and eclipsed conformations of ethane
24. NF₃ and NH₃ show dipole moment. But the dipole moment of NF₃ is less than that of NH₃. Why?
25. Redox reactions are classified into four types. Describe any three of them with suitable example.
26. Explain Markovnikov's rule for the addition reaction with suitable example.

Answer any 4 questions from 27 to 31. Each carries 4 score.

(4x4=16)

27. a) What are the important observations and calculations made by Rutherford from his alpha rays scattering experiment?
- b) Give any two limitations of Rutherford's nuclear model of atom.
28. a) Using molecular orbital diagram explain the paramagnetic nature of O₂ molecule
- b) Calculate the bond order of O₂ molecule.
29. a) Define lattice enthalpy
- b) Draw the Born-Haber cycle for the calculation of lattice enthalpy of ionic crystal of NaCl
30. a) State Le Chatelier's principle
- b) Predict the condition to be applied to maximize the production of NH₃ in the following reaction.
- $$\text{N}_{2(g)} + 3\text{H}_{2(g)} \rightleftharpoons 2\text{NH}_{3(g)} \quad \Delta H = -92.38 \text{ KJ/mol}$$
31. a) How is sodium fusion extract prepared?
- b) Using sodium fusion extract how will you detect the presence of halogen, sulphur and nitrogen in an organic compound?

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