

Standard 11

CHEMISTRY

Part - I

Time: 3.00 Hours

Marks: 70
15 x 1 = 15

Choose the correct answer out of the following choices.

- 1) Which of the following compound has percentage of carbon same as that in ethylene (C₂H₄)?
a) propene b) ethyne c) benzene d) ethane
- 2) Match the list-I and list-II correctly using the code given below the list
- | | |
|-----------------------------|--|
| List - I | List - II |
| A. Principal quantum number | 1. represents the directional orientation of orbital |
| B. Azimuthal quantum number | 2. represents the spin of the electron |
| C. Magnetic quantum number | 3. represents the main shell |
| D. Spin quantum number | 4. represents the subshell |
- | | | | |
|------|---|---|---|
| A | B | C | D |
| a) 3 | 4 | 1 | 2 |
| b) 4 | 2 | 3 | 1 |
| c) 2 | 1 | 4 | 3 |
| d) 1 | 3 | 2 | 4 |
- 3) Assertion: Helium has the highest value of ionisation energy among all the elements known
Reason: Helium has the highest value of electron affinity among all the elements known
a) Both assertion and reason are true and reason is correct explanation for the assertion
b) Both assertion and reason are true but the reason is not the correct explanation for the assertion
c) Assertion is true and the reason is false
d) Both assertion and the reason are false
- 4) The hybridisation of oxygen atom in H₂O and H₂O₂ are respectively
a) SP and SP³ b) SP and SP c) SP and SP² d) SP³ and SP³
- 5) The second ionization enthalpy of alkali metals is _____
a) zero b) low c) high d) very low
- 6) The value of universal gas constant depends upon
a) temperature of the gas b) volume of the gas
c) number of moles of the gas d) units of pressure and volume
- 7) Which of the following is not a thermodynamics function?
a) internal energy b) frictional energy c) entropy d) enthalpy
- 8) In which of the following reaction, K_p > K_c?
a) 2NO_(g) ⇌ N_{2(g)} + O_{2(g)} b) 2NH_{3(g)} ⇌ N_{2(g)} + 3H_{2(g)}
c) 2H_{2(g)} + O_{2(g)} ⇌ 2H_{2O(g)} d) 2SO_{2(g)} + O_{2(g)} ⇌ 2SO_{3(g)}
- 9) Which of the following aqueous solutions has the highest boiling point?
a) 0.1 M KNO₃ b) 0.1 M Na₃PO₄ c) 0.1 M BaCl₂ d) 0.1 M K₂SO₄
- 10) The types of hybridization on the four carbon atoms in 1, 3-Butadiene
a) SP, SP, SP, SP b) SP, SP², SP², SP
c) SP², SP², SP², SP² d) SP², SP, SP², SP
- 11) The IUPAC name of
- $$\text{CH}_3 - \text{CH}_2 - \underset{\text{COOH}}{\text{CH}} - \text{CH} = \text{CH}_2$$
- a) 2-ethylbut-3-enoic acid b) 3-ethylbut-2-enoic acid
c) 2-ethylbut-2-enoic acid d) 3-ethylbut-3-enoic acid
- 12) Decreasing order of nucleophilicity is
a) OH⁻ > NH₂⁻ > ⁻OCH₃ > RNH₂ b) NH₂⁻ > OH⁻ > ⁻OCH₃ > RNH₂
c) NH₂⁻ > CH₃O⁻ > OH⁻ > RNH₂ d) CH₃O⁻ > NH₂⁻ > OH⁻ > RNH₂

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- 13) $2C_2H_5Br + 2Na \xrightarrow{\text{dry ether}} C_4H_{10} + 2NaBr$. The above reaction is an example of which of the following
- a) Reimer Tiemann reaction
 b) Wurtz reaction
 c) Aldol condensation
 d) Hoffmann reaction
- 14) Of the following compounds, which has the highest boiling point?
 a) n-butyl chloride
 b) isobutyl chloride
 c) t-butyl chloride
 d) n-propyl chloride
- 15) Haemoglobin of the blood forms carboxy haemoglobin with
 a) carbon di oxide
 b) carbon tetra chloride
 c) carbon monoxide
 d) carbonic acid

Part - II**Answer any 6 questions Q.no. 24 is compulsory**

6 x 2

- 16) What do you understand by the terms acidity and basicity?
 17) State Pauli's exclusion principle.
 18) What is retrograde solubility? Give example.
 19) Distinguish between diffusion and effusion.
 20) Explain intensive properties with two examples.
 21) Give the general characteristics of organic compounds.
 22) Explain inductive effect with suitable example.
 23) How do you prepare phenol by Dow's process.
 24) Draw the Lewis Structures for the following species: (i) HNO_3 (ii) O

Part - III**Answer any 6 questions Q.No : 33 is compulsory.**

6 x 3

- 25) What is the difference between molecular mass and molar mass? Calculate the molecular mass and molar mass for carbon mono oxide.
 26) Explain the diagonal relationship.
 27) Explain the exchange reactions of deuterium.
 28) Derive ideal gas equation.
 29) If there is no change in concentration, why is the equilibrium state considered dynamic?
 30) A 0.25 M glucose solution at 370.28 K has approximately the pressure of blood. What is the osmotic pressure of blood?
 31) Explain electrophilic substitution reaction with an example.
 32) Explain how does greenhouse effect cause global warming?
 33) Identify the compounds X, Y and Z in the following reaction.

**Part - IV****Answer all the Questions :**

5 x 5

- 34) a) (i) Define mole.
 (ii) What are isoelectronic ions? Give examples.
 (OR)
 b) (i) Derive de Broglie equation showing the dual nature of matter.
 (ii) Give any two limitations of Bohr's atom model.
- 35) a) (i) Why hydrogen peroxide solution is stored in plastic containers?
 (ii) Define modern periodic law
 (OR)
 b) (i) Discuss any two similarities between beryllium and aluminium.
 (ii) Mention the uses of plaster of paris.
- 36) a) State the various statements of second law of thermodynamics.
 (OR)
 b) (i) Deduce the Vant Hoff equation.
 (ii) Define the term 'isotonic solution'
- 37) a) Explain VSEPR theory. Applying this theory to predict the shape of IF_7 .
 (OR)
 b) (i) Explain the classification of organic compounds based on the structure with examples.
- 38) a) (i) Write Friedel Craft's acetylation reaction.
 (ii) Differentiate viable and non-viable particulate pollutants.
 (OR)
 b) (i) Write Swarts reaction. (2) (ii) Write Sandmeyer reaction. (3)