

012

QUARTERLY EXAMINATION - 2023

11508

CLASS : 11

CHEMISTRY

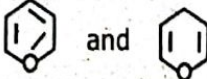


TIME : 3.00 hrs

MARKS : 70

I. Choose the correct answer.

15 X 1 = 15

1. 7.5 g of a gas occupies a volume of 5.6 litres at 0°C and 1 atm pressure. The gas is
 - a) NO
 - b) N₂O
 - c) CO
 - d) CO₂
2. Time independent schrodinger wave equation is
 - a) $\hat{H}\psi = E\psi$
 - b) $\nabla^2\psi + \frac{8\pi^2m}{h^2}(E + V)\psi = 0$
 - c) $\frac{\partial^2\psi}{\partial x^2} + \frac{\partial^2\psi}{\partial y^2} + \frac{\partial^2\psi}{\partial z^2} + \frac{2m}{h^2}(E - V)\psi = 0$
 - d) all of these
3. The element with positive electron gain enthalpy is
 - a) Hydrogen
 - b) Sodium
 - c) Argon
 - d) Fluorine
4. Zeolite used to soften hardness of water is hydrated
 - a) Sodium aluminium silicate
 - b) Calcium aluminium silicate
 - c) Lithium aluminium hydride
 - d) Zinc aluminium borate
5. Which one of the following ions will be smallest in size?
 - a) Na⁺
 - b) Mg²⁺
 - c) F⁻
 - d) O₂⁻
6. The temperature at which real gases obey the ideal gas laws over a wide range of pressure is called
 - a) Critical temperature
 - b) Boyle temperature
 - c) Inversion temperature
 - d) Reduced temperature
7. In an adiabatic process, which of the following is true?
 - a) q = w
 - b) q = 0
 - c) $\Delta E = q + w$
 - d) $P\Delta V = 0$
8. Solubility of CO₂ gas in cold water can be increased by
 - a) increase in pressure
 - b) decrease in pressure
 - c) increase in volume
 - d) None of these
9. In an equilibrium reaction $H_2(g) + I_2(g) \rightleftharpoons 2HI(g)$ $\Delta H = 3000$ calories, which factor favours dissociation of HI
 - a) low temperature
 - b) high pressure
 - c) high temperature
 - d) low pressure
10. Considering entropy (S) as a thermodynamic parameter, the criterion for the spontaneity of any process is
 - a) $\Delta S_{\text{system}} + \Delta S_{\text{surrounding}} > 0$
 - b) $\Delta S_{\text{system}} - \Delta S_{\text{surrounding}} > 0$
 - c) $\Delta S_{\text{system}} > 0$
 - d) $\Delta S_{\text{surrounding}} > 0$
11. The number of stereoisomers of 1, 2 -dihydroxy, cyclopentane
 - a) 1
 - b) 2
 - c) 3
 - d) 4
12. Which of the following is optically active?
 - a) 3 - chloropentane
 - b) 2 chloro propane
 - c) Meso tartaric acid
 - d) Glucose
13. Hyper conjugation is also known as
 - a) no bond resonance
 - b) Baker - nathan effect
 - c) both (a) & (b)
 - d) None of these
14.  are belonging to category.
 - a) heterocyclic
 - b) homocyclic
 - c) aromatic
 - d) alicyclic
15. The hybridised orbitals of carbocation and carbanion are and respectively
 - a) sp, sp
 - b) sp², sp³
 - c) sp³, sp²
 - d) sp³, sp

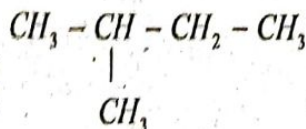
11 Chemistry PAGE-1

II Answer any six questions number 24 is compulsory.

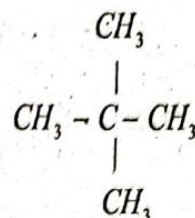
6 X 2 = 12

16. Define gram equivalent mass.
17. State Aufbau principle.
18. Give the general electronic configuration of Lanthanides and Actinides.
19. **What is syn gas. How is it prepared?**
20. State Dalton's law of partial pressure?
21. Define Hess's law of constant heat of summation.
22. What is the effect of addition of inert gas on the reaction at equilibrium?
23. What is resonance?

24. Write the IUPAS for the following compounds. a)



b)

**III Answer any six questions and question number 33 is compulsory.**

6 X 3 = 18

25. Distinguish between oxidation and reduction.
26. Derive De Broglie equation.
27. Explain why electron affinity of Be and N is almost zero.
28. Write the exchange reaction of reaction of deuterium.
29. Distinguish between extensive and intensive property.
30. Derive the relationship between K_p and K_c .
31. Give any 3 characteristics of organic compounds
32. Give any 3 differences between nucleophile and electrophile.
33. Inside a certain automobile engine the volume of air in cylinder is 0.375 dm^3 , when the pressure is 1.05 atm . When the gas is compressed to a volume of 0.125 dm^3 at the same temperature what is pressure of the compressed air?

IV Answer all the questions.

5 X 5 = 25

34. A) i) Calculate the oxidation number of underlined element a) $\underline{\text{C}}$ in CO_2 b) $\underline{\text{S}}$ in H_2SO_4 (2)
ii) A compound having the empirical formula $\text{C}_6\text{H}_6\text{O}$ has the vapour density 47. Find its molecular formula. (3) (OR)
- B) i) What is exchange energy. ii) Write short notes a) Principle Quantum number b) Spin quantum number (2)
35. A) i) State the trends in the variation of electronegativity in group and period. (2)
(OR) ii) Compare the ionisation energy of Be and B. (OR)
- b) i) Why hydrogen peroxide is stored in plastic container not in glass container. (2)
ii) Write short note on ortho and para hydrogen.
36. A) i) Derive the value of critical constants in terms of Vanderwaals constant. (OR) 5
B) i) Calculate the entropy change during melting of one mole of ice into water at 0°C and 1 atm pressure. Enthalpy of fusion of ice is 6008 J mol^{-1} .
ii) Write any 3 characteristics of Gibbs energy. (3)
37. A) i) State Le Chatelier's Principle. (OR) (2)
ii) Explain how will you predict the direction of an equilibrium reaction. (OR)
B) i) How will you detect the presence of nitrogen and sulphur together in an organic compound? (2)
ii) 0.30 g of a substance gives 0.88 g of CO_2 and 0.54 g water. Calculate the percentage of C and H in it.
38. A) i) What are elimination reactions? Give an example. (2) ii) Describe Fajan's rule. (3)
(OR) B) i) Explain position isomerism with an example. (OR)
ii) Explain inductive effect.