

PM SHRI KENDRIYA VIDYALAYA SITAPUR SHIFT-1

PT-1 SESSION 2025-26

Class-11

TIME-90 MIN

SUBJECT- CHEMISTRY

M.M.-40

1. The significant figures in 0.00051 are _____.

- (a) 5 (b) 3 (c) 2 (d) 26

2. Which of the following pairs of gases contains the same number of molecules?

- (a) 16 g of O_2 and 14 g of N_2
(b) 6 g of O_2 and 22 g of CO_2
(c) 28 g of N_2 and 22 g of CO_2
(d) 32 g of CO_2 and 32g of N_2

3. The empirical formula and molecular mass of a compound are CH_2O and 180 g respectively. What will be the molecular formula of the compound?

- (a) $C_9H_{18}O_9$ (b) CH_2O (c) $C_6H_{12}O_6$ (d) $C_2H_4O_2$

4.. Which one will have maximum number of water molecules?

- (a) 18 molecules of water (b) 1.8 grams of water
(c) 18 grams of water (d) 18 moles of water

5. Principal, Azimuthal and magnetic quantum numbers are respectively related to:

- (a) Size, shape and orientation (b) Shape, size and orientation
(c) Size, orientation and shape (d) None of the above

6. The electronic configuration of chromium ($Z=24$) is:

- (a) $[Ne] 3s^2 3p^6 3d^4 4s^2$ (b) $[Ne] 3s^2 3p^6 3d^5 4s^1$
(c) $[Ne] 3s^2 3p^6 3d^1 4s^2$ (d) $[Ne] 3s^2 3p^6 4s^2 4p^4$

7. Which of the following is not permissible?

- (a) $n = 4, l = 3, m = 0$ (b) $n = 4, l = 2, m = 1$
(c) $n = 4, l = 4, m = 1$ (d) $n = 4, l = 0, m = 0$

8. According to Aufbau's principle, which of the following orbital should be filled first?

(a) 5d

(b) 4p

(a) 3p

(a) 2s

Directions : Each of these questions contain two statements, Assertion and Reason. Each of these questions also has four alternative choices, only one of which is the correct answer. You have to select one of the codes (a), (b), (c) and (d) given below.

(a) Assertion is correct, reason is correct; reason is a correct explanation for assertion.

(b) Assertion is correct, reason is correct; reason is not a correct explanation for assertion

(c) Assertion is correct, reason is incorrect

(d) Assertion is incorrect, reason is correct.

9. Assertion : It is impossible to determine the exact position and exact momentum of an electron simultaneously.

Reason : The path of an electron in an atom is clearly defined.

10. Assertion: One mole of SO_2 contains double the number of molecules present in one mole of O_2 .

Reason: Molecular weight of SO_2 is double to that of O_2 .

Very Short Answer (2 mark each)

11. State the differences between molarity and molality..

12. State law of multiple proportion with suitable example?

13 If the initial volume is 2 litres, the initial molarity is 6M and the final volume is 6 litres. Find the Final Molarity. Consider final molarity to be M_2 .

14. Define photoelectric effect. How do intensity and frequency of light affects the photoelectric effect.

15. Write all the possible set of quantum numbers for the last electron of sodium and chlorine.

(3 marks each)

16. Calculate the velocity of an electron if its position is known with an uncertainty of 10^{-10} m (given $h = 6.626 \times 10^{-34}$ Js and mass of electron = 9.1×10^{-31} kg).

17. Write (i) Aufbau principle (ii) Hund's rule (iii) Pauli's exclusion principle

18. The Balmer series in the hydrogen spectrum corresponds to the transition from $n_1 = 2$ to $n_2 = 3, 4, \dots$. This series lies in the visible region. Calculate the wave number of the line associated with the transition in the Balmer series when the electron moves to $n = 4$ orbit. ($R_H = 109677 \text{ cm}^{-1}$)

19. What is limiting reagent? In the reaction $2A + 4B \rightarrow 3C + 4D$, when 5 moles of A react with 6 moles of B, then (i) Which is the limiting reagent? (ii) Calculate the amount of C formed?

20. A compound contains 4.07% hydrogen, 24.27% carbon, and 71.65% chlorine. Its molar mass is 98.96 g/mol. Determine its empirical and molecular formula.

(5 marks)

21(a). Write electronic configuration of the following (i) S (ii) F (iii) K (iv) Cr (v) Cu
(vi) Mg

21(b). Arrange the following orbitals in the increasing order of energy

(a) 1s, 2s, 3s, 3p

(b) 4s, 3s, 3p, 4d

Or

21. According to de Broglie, the matter should exhibit dual behaviour, that is, both particle and wave like properties. However, a cricket ball of mass 100 g does not move like a wave when it is thrown by a bowler at a speed of 100 km/h. Calculate the wavelength of the ball and explain why it does not show wave nature.