

Time: 2 Hour

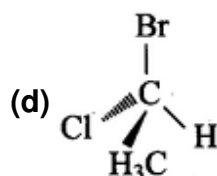
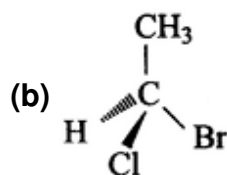
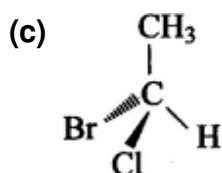
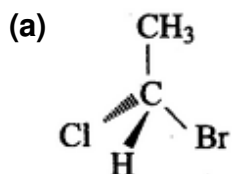
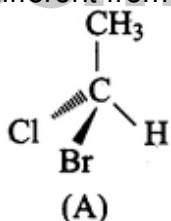
Total Marks: 60

Class : XI

Subject : Chemistry

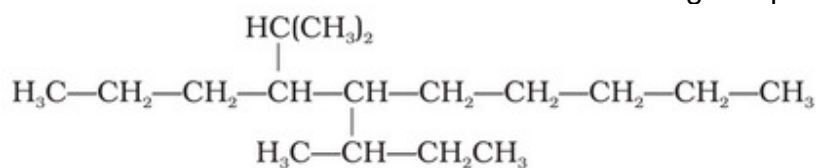
MCQ MULTIPLE CORRECT

1. Which of the following statements concerning the quantum numbers are correct?
- (a) Angular quantum number determines the three dimensional shape of the orbital. (b) The principal quantum number determines the orientation and energy of the orbital.
- (c) Magnetic quantum number determines the size of the orbital. (d) Spin quantum number of an electron determines the orientation of the spin of electron relative to the chosen axis.
2. Which of the following sets contain only isoelectronic ions?
- (a) Zn^{2+} , Ca^{2+} , Ga^{3+} , Al^{3+} (b) K^+ , Ca^{2+} , Sc^{3+} , Cl^-
- (c) P^{3-} , S^{2-} , Cl^- , K^+ (d) Ti^{4+} , Ar , Cl^{3+} , V^{5+}
3. Which of the following compounds are readily soluble in water?
- (a) $BeSO_4$ (b) $MgSO_4$
- (c) $BaSO_4$ (d) $SrSO_4$
4. In which of the following representations given below spatial arrangement of group/atom is different from that given in structure 'A'?



All The Best!!!

5. Which are the correct IUPAC names of the following compound?

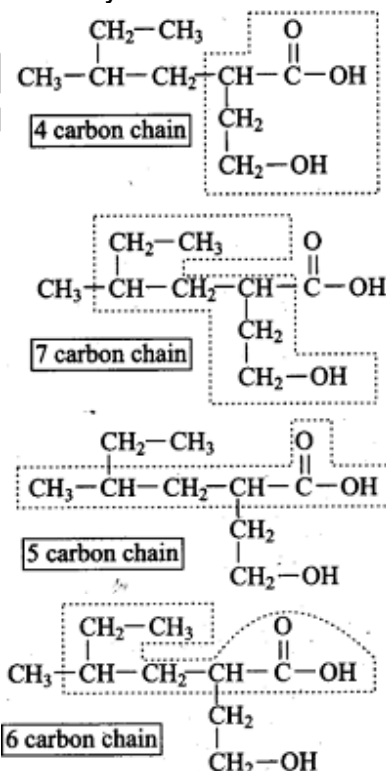


- (a) 5- Butyl - 4- isopropyldecane
 (c) 5- sec-Butyl - 4- iso-propyldecane

- (b) 5- Ethyl - 4- propyldecane
 (d) 4-(1-methylethyl)- 5 - (1-methylpropyl)-decane

VERY SHORT DESC

6. Draw the possible resonance structures for $\text{CH}_3-\ddot{\text{O}}-\overset{+}{\text{C}}\text{H}_2$ and predict which of the structures is more stable. Give reason.
7. If a liquid compound decomposes at its boiling point, which method(s) will you choose for its purification? It is known that the compound is stable at low pressure, steam volatile and insoluble in water.
8. What is the difference between molality and molarity?
9. Which of the following selected chains is correct to name the given compound according to IUPAC system?



10. Arrange s, p and d sub-shells of a shell in the increasing order of effective nuclear charge (Z_{eff}) experienced by the electron present in them.

SHORT DESC - 25 WORDS

11. At 25°C and 760 mm of Hg pressure a gas occupies 600 mL volume. What will be its pressure at a height where temperature is 10°C and volume of the gas is 640 mL?
12. Draw the structures of cis- and trans-isomers of the following compounds. Also write their IUPAC names.
(i) $\text{CHCl}=\text{CHCl}$ (ii) $\text{C}_2\text{HC}(\text{CH}_3)=\text{C}(\text{CH}_3)\text{C}_2\text{H}_5$
13. Define molality. How does molality depend on temperature?
14. Explain, why an organic liquid vaporizes at a temperature below its boiling point in its steam distillation?
15. Explain the important aspect of resonance with reference to the CO_3^{2-} ion.

MED DESC - 50 WORDS

16. Draw the cis- and trans-structures for hex-2-ene. Which isomer will have higher b.p and why?
17. Write the significance /applications of dipole moment.
18. Which out of NH_3 and NF_3 has higher dipole moment and why?
19. The cost of table salt (NaCl) and table sugar are Rs. 1 per kg and Rs. 6 per kg respectively calculate their cost per mole.
20. Arrange benzene, n-hexane and ethyne in decreasing order of acidic behaviour. Also give reason for this behaviour.

LONG DESC - 100 WORDS

21. The first ($\Delta_i H_1$) and the ($\Delta_i H_2$) ionization enthalpies (in kJ mol^{-1}) and the ($\Delta_{\text{eg}} H$) electron gain enthalpy (in kJ mol^{-1}) of a few elements are given below:

Element	$\Delta_i H_1$	$\Delta_i H_2$	$\Delta_{\text{eg}} H$
I	520	7300	- 60
II	419	3051	- 48
III	1681	3374	- 328
IV	1008	1846	- 295
V	2372	5251	+ 48
VI	738	1451	- 40

Which of the above element is likely to be:

- (a) the least reactive metal
 - (b) the most reactive metal
 - (c) the most reactive non-metal
 - (d) the least reactive non-metal
 - (e) the metal which can form a stable binary halide of the formula MX_2 (X = halogen)?
 - (f) the metal which can form predominantly stable covalent halide of the formula MX (X = halogen)?
22. Predict the products of electrolysis in each of the following:
 - (i) An aqueous solution of AgNO_3 with silver electrodes.

- (ii) An aqueous solution of silver nitrate with platinum electrodes.
- (iii) A dilute solution of H_2SO_4 with platinum electrodes.
- (iv) An aqueous solution of CuCl_2 with platinum electrodes.

23. What were the weaknesses or limitations of Bohr's model of atoms? Briefly describe the quantum mechanical model of atom?
24. Discuss the factors that influence the magnitude of ionization enthalpy. What are the general trends of variation of ionization enthalpy in the periodic table? Explain.
25. Write four informations about the reaction:
- $$(\text{CN})_2(\text{g}) + 2\text{OH}^-(\text{aq}) \longrightarrow \text{CN}^-(\text{aq}) + \text{CNO}^-(\text{aq}) + \text{H}_2\text{O}(\text{l})$$

MATCH THE PAIRS

26. Match the elements given in Column I with the properties mentioned in Column II.

	Column I		Column II
i	Li	(a)	Insoluble sulphate
ii	Na	(b)	Strongest monoacidic base
iii	Ca	(c)	Most negative E° value among alkali metals
iv	Ba	(d)	Insoluble oxalate
		(e)	$6s^2$ outer electronic configuration

- (a) (i → c); (ii → b); (iii → d); (iv → a, e) (b) (i → d); (ii → c); (iii → a); (iv → b, e)
- (c) (i → e); (ii → d); (iii → b); (iv → a, e) (d) None of these

27. Match the following rules with their statements :

	Rules		Statements
(i)	Hund's Rule	(a)	No two electrons in an atom can have the same set of four quantum numbers.
(ii)	Aufbau Principle	(b)	Half-filled and completely filled orbitals have extra stability.
(iii)	Pauli Exclusion Principle	(c)	Pairing of electrons in the orbitals belonging to the same subshell does not take place until each orbital is singly occupied.
(iv)	Heisenberg's Uncertainty Principle	(d)	It is impossible to determine the exact position and exact momentum of a subatomic particle simultaneously.
		(e)	In the ground state of atoms, orbitals are filled in the order of their increasing energies.

- (a) (i) - (c) (ii) - (e) (iii) - (a) (iv) - (d) (b) (i) - (d) (ii) - (c) (iii) - (a) (iv) - (b)

(c) (i) - (b) (ii) - (a) (iii) - (c) (iv) - (d)

(d) None of these

28. Match the following:

(i)	88 g of CO_2	(a)	0.25 mol
(ii)	6.022×10^{23} molecules of H_2O	(b)	2 mol
(iii)	5.6 litres of O_2 at STP	(c)	1 mol
(iv)	96 g of O_2	(d)	6.022×10^{23} mol
(v)	1 mole of any gas	(e)	3 mol

(a) (i) - (b) (ii) - (c) (iii) - (a) (iv) - (e) (v) - (d)

(b) (i) - (c) (ii) - (a) (iii) - (b) (iv) - (e) (v) - (d)

(c) (i) - (d) (ii) - (e) (iii) - (a) (iv) - (c) (v) - (b)

(d) None of these

29. Match the quantum numbers with the information provided by these.

	Quantum number		Information provided
(i)	Principal quantum number	(a)	orientation of the orbital
(ii)	Azimuthal quantum number	(b)	energy and size of orbital
(iii)	Magnetic quantum number	(c)	spin of electron
(iv)	Spin quantum number	(d)	shape of the orbital

(a) (i) - (b) (ii) - (d) (iii) - (a) (iv) - (c)

(b) (i) - (c) (ii) - (a) (iii) - (d) (iv) - (c)

(c) (i) - (d) (ii) - (c) (iii) - (b) (iv) - (a)

(d) None of these

30. Match the compounds given in Column I with their uses mentioned in Column II

	Column I		Column II
(i)	CaCO_3	(a)	Dentistry, ornamental work
(ii)	Ca(OH)_2	(b)	Manufacture of sodium carbonate from caustic soda
(iii)	CaO	(c)	Manufacture of high quality paper
(iv)	CaSO_4	(d)	Used in white washing

(a) (i → c); (ii → d); (iii → b); (iv → a)

(b) (i → d); (ii → c); (iii → a); (iv → b)

(c) (i → b); (ii → a); (iii → d); (iv → c)

(d) None of these