

INTERNATIONAL INDIAN SCHOOL DAMMAM

FIRST TERMINAL EXAMINATION- JULY 2017

CLASS : XI CHEMISTRY

SET - A

TIME: 3 Hours

MAX.MARKS :70

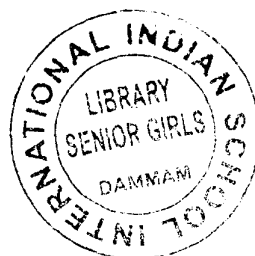
General instructions :

1. All questions are compulsory'
2. Questions 1 to 5 are very short answer type carrying 1 mark each.
3. Questions 6 to 10 are short answer type carrying 2 mark each .
4. Questions 11 to 22 are also short answer type carrying 3 mark each .
5. Question 23 is value based and carries 4 marks .
6. Questions 24, 25 & 26 are long answer type carrying 5 marks each .

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1. How many atoms of potassium are there in 19.5 gram of potassium .
(Atomic mass of K = 39 u)

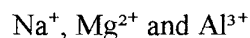
2. Which series of hydrogen spectrum lies in visible region .
3. Why is 4s orbitals filled before 3d orbital ?
4. Write the general electronic configuration of f – block elements .
5. What is the nature of oxides formed by most of p – block elements ?
6. (a) What is the mass of 5.6 L of SO_2 gas at STP.
(b) How are 0.50 mol NaOH and 0.50 M NaOH different ?
7. Give the possible values of l and m_l for electrons when $n = 3$.
8. Define molality. Why molality is preferred over molarity for expressing the concentration of a solution ?
- 9.(a) What is the total number of orbitals associated with principal quantum number : $n = 4$?



P.T.O.

(b) Write the electronic configuration of chromium atom. (Atomic number = 24).

10.(a) Arrange the following in the order of increasing ionic radii.



(b) On the basis of quantum numbers, justify that the sixth period of the periodic table should have 32 elements.

11. (a) Define dipole moment and mention its one application.

(b) Write the resonating structures of CO_3^{2-} .

12. (a) The first ionization enthalpy values (in kJmol^{-1}) of group 13 elements are :

B	Al	Ga	In	Tl
801	577	579	558	589

How would you explain this deviation from the general trend?

(b) How would you explain the fact that the first ionisation enthalpy of Na is lower than Mg but second ionisation enthalpy of Na is higher than Magnesium?

(c) Assign the position of elements having outer electronic configuration : $ns^2 np^5$ for $n=4$
in P.T.

13. (a) The two O – O bond length in ozone molecule are equal . Justify

(b) What is the change in hybridization of Al atom in the following reaction :



(c) H_2O is liquid but H_2S is gas . Why ?

14. (a) Define lattice enthalpy .

(b) Write IUPAC name and symbol for the element with atomic number 124 .

(c) Electron gain enthalpy of chlorine is higher than fluorine . Why ?

15. The elemental composition of butyric acid contained 54.2% C , 9.2% H and remaining oxygen . The molecular mass of this compound is 88u .Determine its empirical formula and molecular formula .

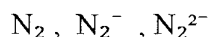
[Atomic mass of H = 1 , C = 12 , O = 16]

16. (a) Bond angle in NH_3 is lesser than NH_4^+ . why?

(b) What is polar covalent bond ?

(c) SO_2 is polar but CO_2 is non – polar . Why ?

17. Compare the relative stability of the following species and indicate their magnetic properties;



18. (a) Define : (i) limiting reagent (ii) mole fraction .

(b) Calculate the amount of CO_2 gas produced when 2 moles of carbon is burnt in 16g of dioxygen .

19. (a) What are the conditions for the linear combination of atomic orbitals ?

(b) Deduce the shape of XeF_2 molecule on the basis of VSEPR theory .

20. (i) State Heisenberg's uncertainty principle .

(ii) The mass of electron = 9.1×10^{-31} kg . If its K.E. is 4.55×10^{-25} J , calculate its wave length.

$$(h = 6.63 \times 10^{-34} \text{ J s})$$

21. (a) State the principle which limits the number of electrons in an orbital as two .

(b) How are orbitals $dx^2 - y^2$ and d_{yz} oriented in space?

(c) Explain why atoms in the half filled and completely filled orbitals have extra stability?

22. (a) What is meant by nodal surface. Find the number of nodal planes in 3d orbital.

(b) Write two important properties of cathode rays .

23. Mendeleev was a versatile genius . He worked on many problems connected with natural resources . He invented an accurate barometer . Mendeleev had a most important contribution in periodic table and discovery of new elements by predicting their properties .

(a) In terms of period and group where you locate the element with $Z = 114$?

(b) Why do we conserve our natural resources ?

(c) What value were possessed by Mendeleev ?

24. (a) Define molecular and empirical formula .

(b) There are two isotopes of an element with atomic mass y . The atomic mass heavier isotope is $y+2$ and that of lighter one is $y-1$. Calculate the abundance of lighter isotope

(c) Which one has more number of atoms and why ?

1 g Li or 1 g Na . (Atomic mass of Li = 7 & Na = 23)

OR

- (a) State law of multiple proportions and Gay Lussac's law of gaseous volumes .
- (b) The density of 3M solution of NaCl is 1.25 g ml^{-1} . Calculate molality of the solution .
- (c) Convert 1 km into pm .

25. (a) Show that the circumference of the Bohr orbit for the hydrogen atom is an integral multiple of the de Broglie wavelength associated with the electron revolving around the orbit.

(b) The ejection of the photoelectron from the silver metal in the photoelectric effect experiment can be stopped by applying the voltage of 0.35 V when the radiation 256.7 nm is used. Calculate the work function for silver metal.

OR

(a) list two main difference between orbit and orbital .

(b) Emission transitions in the Paschen series end at orbit $n = 3$ and start from orbit " n " and can be represented as $\nu = 3.29 \times 10^{15} \text{ (Hz)} \left(\frac{1}{3^2} - \frac{1}{n^2} \right)$

Calculate the value of " n " if the transition is observed at 1285 nm . Find the region of the spectrum .

26. (a) What is meant by hybridisation of atomic orbitals?

(b) Describe the hybridization in case of PCl_5 .

(c) Distinguish between bonding and antibonding molecular orbitals .

OR

(a) Write any four salient features of molecular orbital theory .

(b) Draw diagram showing the formation of a double bond between carbon atoms in C_2H_4 molecule .

(c) Distinguish between a sigma and a pi bond .

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