Roll Number		

SET A

INDIAN SCHOOL MUSCAT
HALF YEARLY EXAMINATION
SUBJECT : CHEMISTRY

CLASS: XI Sub.Code: 043 Time Allotted: 3 Hrs.

22.09.2019 Max.Marks:70

General Instructions:

i. *All questions are compulsory.*
ii. *Section A: Q.no. 1 to 20 are objective type questions and carry 1 mark each.*
iii. *Section B: Q.no. 21 to 27 are short answer questions and carry 2 marks each.*
iv. *Section C: Q.no. 28 to 34 are also short answer questions and carry 3 marks each.*
v. *Section D: Q.no. 35 to 37 are long answer questions and carry 5 marks each.*
vi. *There is no overall choice. However an internal choice has been provided in two questions of two marks, three questions of three marks and all the three questions of five marks weightage. You have to attempt only one of the choices in such questions.*
vii. *Use of log tables if necessary, use of calculators is not allowed.*

1. High concentration of fluoride is harmful to bones and teeth at levels over 1
   a) 1 ppm b) 3ppm c) 5 ppm d) 10 ppm

2. Which of the following element can show covalency greater than 4. 1

   a) Be b)B c) S d) O

3. Which of the following is not a green house gas 1
   a) CO_2 b) O_3 c)CH_4 d)N_2
4. In Antartica, ,ozone depletion is due to the formation of 1

   a)Acrolein b)Peroxyacetylnitrate c)formaldehyde d)Chlorine nitrate
5. All are primary pollutants except 1
   a) H_2SO_4 b) SO_2 c)NO_2 d) particulate matter
6. The de-Broglie wavelength associated with a body of mass 1000g moving with a velocity 100 ms^{-1} is ($h=6.63x10^{-34}$ Js) 1
   a) 6.62×10^{-39} m b) 6.62×10^{-38} m c) 6.62×10^{-36}cm d) 3.31×10^{-32}m
7. Which of the following carbonate is the most stable? 1

   a) $CaCO_3$ b)$MgCO_3$ c)$SrCO_3$ d)$BaCO_3$
8. The polarity of covalent bond is maximum in 1

   a) F-F b) C-F c) N-F d) O-F

9. Suggest the factor which makes Li, the strongest reducing agent in aqueous solution. 1

a) Sublimation enthalpy b)Ionisation enthalpy
c) Hydration enthalpy d) Electron gain enthalpy

10. Which of the following species has tetrahedral geometry? 1
a) BH_4^- b)NH_2^- c)NH_4^+ d)CO_3^{2-}
11. ____ and ____ are essential for the transmission of impulses along nerve fibres. 1

12. The deep blue colour of the solution of sodium in liquid ammonia is due to_____ 1

13. Excess nitrate in drinking water can cause disease like_____ 1

14. Bond angle in SF_6 is_____- 1

15. The number of electrons ejected is directly proportional to ____ of the light 1

16. Give the Bohr formula to calculate the angular momentum of an electron. 1

17. Write the name of alkali metal cation which has the highest polarizing power? 1

18. Give two examples of odd electron molecules. 1

19. Write the name of the block in which element with atomic number 56 belongs? 1

20. What is the total number of electrons that can be accommodated in all the orbitals having principal quantum number 2 and azimuthal quantum number 1? 1
21. What happens when 2
a) Magnesium is burnt in air b) quick lime is heated with silica?
22. Explain the manufacture of washing soda. 2

23. Briefly explain Planck's Quantum theory. 2

OR

Distinguish between orbit and orbital.(any two points of difference)

24. a) Electron has negative energy in an atom. Why? 2
b) How does Bohr model explain the simultaneous appearance of a large number of lines in the hydrogen spectrum?

OR

a) Define photoelectric effect
b) Give the significance of magnetic quantum number
25. The speed of an electron moving at 500m/s is measured within the accuracy of 0.02%. What would be the minimum error in determining its position? 2

($h=6.63 \times 10^{-34}$ Js, Mass of electron = 9.1×10^{-31} Kg)

26. a) Draw the orbital overlapping box diagram for the formation of H_2O . 2

b) Find the total number of sigma and pi bonds in the following molecule.

$CH_2=C=CH-CH_3$

27. In each of the following pairs, predict which has higher value of the property mentioned and justify it. 2

a) C_2H_2, C_2H_4 (s-character in the hybridization of carbon)

b) CO_2, SO_2 (Bond angle)

28. Define the following. 3

a) Biological Oxygen demand

b) Green Chemistry

c) Eutrophication

OR

a) What are the two harmful effects of photochemical smog? How can it be controlled?

b) Give one difference between photochemical and classical smog.

29. Account for the following 3

a) An aqueous solution of sodium carbonate is alkaline to litmus

b) CsI has low solubility in water

c) Lithium does not form peroxide.

30. a) Which is more stable Fe^{2+} or Fe^{3+} why? (Z=26) 3

b) Among the following pairs of orbitals which orbital will experience the larger effective nuclear charge?

(i) 2s and 3s (ii) 4d and 4p

OR

a) Define wave number.

b) Write the electronic configuration of Cu (Z=29)

c) Calculate the total number of nodes associated with 4f orbital.

31. a) Explain the shapes of the following using VSEPR theory. 3

i) PCl_5 ii) ClF_3

b) Draw the Lewis structure of $HClO_4$

OR

a) Write any two factors which affect ionic bond formation

b) Hydrogen bonding in HC l is insignificant Why?

c) p_x orbital doesnot overlap with p_y orbital.why?

32. Which one of the following has greater property mentioned? Why? 3

a) Na or Mg (Atomic radius)

b) Be or B(First ionisation energy)

c) F or Cl (Electron gain enthalpy)

33. What are d – block elements? Give their general electronic configuration. Write any two general properties 3

34. Calculate the radius and energy associated with fifth orbit of hydrogen atom. 3

35. a) State . 5
    i) Paulis Exclusion principle
    ii) Aufbau principle
    b) When electromagnetic radiation of wavelength 2000 A^0 falls on the surface of a metal, electrons are emitted with a kinetic energy of $2.67x10^{-19}$ J/atom.

    i) What is the work function of the metal?

    ii) What is the maximum wavelength that will cause a photo electron to be emitted?

OR

a) Write any two characteristics of electromagnetic radiations.

b) What is emission spectrum?

c) What are the frequency ,wavelength and energy , ΔE of the radiation emitted during the transition of electron from n=5 to n=2 in hydrogen atom

($c = 3x10^8 ms^{-1}$)

36. a) Account for the following 5
    i) The bond angle in PH_3 is smaller than NH_3.
    ii) BeH_2 molecule has zero dipole moment although the Be–H bonds are polar.
    b) Using the concept of hybridisation explain the shape of Methane .

OR

a) Draw the resonance structures of NO_3^-
b) Calculate the formal charge on oxygen atoms in Ozone.
c) Using molecular orbital theory calculate the bond order and predict the magnetic property of O_2

37. a) Account for the following 5
    i) Elements in the same group have similar physical and chemical properties
    ii) Oxygen has lower ionization energy than Nitrogen.

    b) What are iso electronic species? Write any two species that are iso electronic with Mg^{2+}
    c) Write the IUPAC name and symbol for the element with atomic number 134

OR

a) Size of the cation is smaller than that of the neutral atom while size of the anion is more. Give reason with example.
b) Lanthanoids and actinoids are placed separately at the bottom of the periodic table.Why?
c) Predict the position of an element having outer electronic configuration $(n-1)d^2\ ns^2$ for n=4
d) Boron forms $[BF4]^-$ but aluminium forms $[AlF_6]^{3-}$. Account

End of the Question Paper