**Sample Paper 2013**

**CLASS – XI**

**SUBJECT – Chemistry**

**TIME : 3 Hours M.M. 70**

***General instructions :-***

1. All questions are compulsory
2. Internal choices has been provided in some questions you have to attempt only one of the choice in such questions.
3. Q.No 1 to 8 are very short answer type questions, carrying one mark each.
4. Q. No. 9 to 18 are short answer type questions, carrying two mark each.
5. Q.No. 19 to 27 are also short answer questions, carrying three mark each.
6. Q.No. 28 to 30 are long answer type questions, carrying five mark each.
7. Use of calculators is not permitted. However you may use log tables, if necessary.

1 .Why in the building of the atom, the filling of 4s orbitals takes place before 3d orbital? (1)

2 .Out of N2 and NH3, which one will have greater value of ‘a’ and which one will have greater value of ‘b’? (1)

3 .Which compound among the following has the lowest oxidation number of Mn?

KMnO4, K2MnO4, MnO2, Mn2O3 (1)

4 .What are electron rich hydrides? Give example. (1)

5 .Why does Beryllium show similarities with Aluminum? (1)

6 Why ‘photochemical smog is so called? (1)

7 Name two important sinks of SO2? (1)

8 Name two methods generally used in Green chemistry. (1)

9 What are the frequency and wavelength of a photon emitted during a transition from the n=5 state to n=2 state in the hydrogen atom? (2)

10 An element A has atomic number 11.

1. Represent its electronic configuration.
2. To which group of periodic table does it belong?
3. What is its valency?
4. Write the formula of its oxide. (2)

11 The first ionization energy of carbon atom is greater than that of boron atom, whereas reverse is true for the second ionization energy. Explain. (2)

12 On the basis of VSEPR theory predict the shapes of –BeCl2, SiCl4  (2)

13 Balance following equation in basic medium by using oxidation number method or ion-electron method.

 MnO4-(aq) + I- (aq) → MnO2(s) +I2 (s) (2)

14 Write two properties of water which are due to hydrogen bonding. (2)

15 Why is it that on being heated in excess supply of air K, Rb and Cs form super oxides in preference to oxides and peroxides? (2)

16Account for the following :

1. Na and K impart colour to the flame but Mg does not .
2. Li is the best reducing agent in aqueous solution . (2)

17 What is inert pair effect? Give one example. (2)

18 What is inductive effect? Explain in brief. (2)

19 What is the density of SO2 gas at 27oC and 2 atmospheric pressure? (At Wts. S=32, O=16, R=0.08219 (atm K-1 mol-1 ) (3)

20 (a) A sample of NaOH weighing 0.40g is dissolved in water and the solution is made to 50.0ml in volumetric flask. What is the molarity of the resulting solution?

(b) How many grams of NaOH should be dissolved to make 100 ml of 0.15 M NaOH solution?(3)

21 What is the basic idea of Molecular orbital theory? How will you prove that neon molecule does not exist? (3)

22 Enthalpy and entropy changes of a reaction are 40.63kJ/mol and 108.8J/k/mol respectively. Predict the feasibility of the reaction at 270C. (3)

23 What are the factors which are responsible for spontaneity of reaction? Explain in brief. What is second law of thermodynamics? (3)

24 What is Le Chatelier’s Principle ? Explain One of it’s Applications in detail . (3)

25 Some solid NH4HS is placed in a flask Containing 0.5 atm of NH3 .What would be the pressure of NH3 and H2S when equilibrium is reached ?

 NH4HS(S) → NH3 (g)+ H2S (3)

26 How will you convert:

1. Benzene to toluene
2. Benzene to Benzene sulphonic acid
3. Acetylene to benzene . (3)

27 What is the maximum number of unpaired electrons in Cu(Z=29), Br-( Z=35) and K+ (Z=19)? (3)

28 (i) Write bondline formula for (1) tertiary butylcyclopentane.

 (ii) Write IUPAC name of the following compounds.

 CH2 = C - COOCH3

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 CH3

(iii) What are nucleophiles and electrophiles? Explain with examples.

(iv)Explain nucleophilic substitution reaction with the help of an example. (5)

 OR

What is Isomerism? Classify them and explain each type in brief. (5)

29 (a) Explain the following:

1. Why alkenes are more reactive than alkanes?
2. Acetylene reacts with ammoniacal silver nitrate solution or ammoniacal cuprous chloride solution or soda amide to form an acetylide while ethylene does not.
3. Why alkynes are slightly more soluble than alkenes and alkanes?

(b) Carry out the following conversions:

Ethane to ethene (ii) Ethene to ethane (3+2)

 OR

(a)What is Huckel’s rule? Show whether the following compounds exhibit aromaticity?



(b) A compound A, with molecular formula, C4H9Br, on treatment with alcoholic KOH gave compound B, C4H8 . Treatment of B with ozone followed by reduction yielded CH3CHO as the only product. What is the structure of A? (2+3)

30 Give reasons:

1. Concentrated HNO3 can be transported in aluminium container.
2. Graphite is used as lubricant.
3. A mixture of dilute NaOH and aluminium pieces is used to open drain.
4. Carbon shows catenation but silicon does not.
5. Tin (II) is a reducing agent but Pb (II) is not. (5)

 OR

 A certain salt (X), gives the following results:

1. Its aqueous solution is alkaline to litmus.
2. It swells up to a glassy material Y on strong heating.
3. When concentrated H2SO4 is heated to a hot solution of X, white crystals of an acid Z separates out.
4. Write equations for all the above reactions and identify X, Yand Z. (5)

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