THE JAIN INTERNATIONAL SCHOOL, BILASPUR

A JGI Institution

ANNUAL EXAMINATION (2016-17)

CLASS :	XI	SUBJECT :	CHEMISTRY	TIME :	3 Hours

General Instructions:

(i) All questions are compulsory.
(ii) Marks for each question are indicated against it.
*(iii) Question numbers **1 to 5** are very short-answer questions and carry **1** mark each.*
*(iv) Question numbers **6 to 10** are short-answer questions and carry **2** marks each.*
*(v) Question numbers **11 to 22** are also short-answer questions and carry **3** marks each.*
*(vi) Question number **24** is value based question and carries 4 mark.*
(vii) Question numbers **24 to 26** are long-answer questions and carry **5** marks each.

*(viii) Use Log Tables, if necessary, Use of calculators is **not** allowed.*

1. Beryllium and Magnesium do not give colour to flame whereas other alkaline metals do so.Why?
2. Aluminium atom loses electrons successively to form Al^{+},Al^{2+} and Al^{3+} ions.Which step will have higher Ionisation enthalpy ?
3. Viscosity of liquids ……..with a rise in temperature.
4. Calculate the mass of one mole of electrons in grams.
5. Write the relationship between Kp and Kc for the reaction : $PCl_5(g) \leftrightarrow PCl_3(g) + Cl_2(g)$
6. Give reasons for the following :
   i) Concentrated HNO_3 can be transported in Aluminium container.
   ii) A mixture of dilute NaOH and Aluminium pieces is used to open drain.
7. Calculate the wavelength of an electromagnetic radiation having a frequency of 1368 kHz.
8. For the exothermic formation of sulphur trioxide from sulphur dioxide and oxygen in the gas phase : $2SO_2(g) + O_2(g) \leftrightarrow 2SO_3(g)$
   i) Write the expression for the equilibrium constant for the reaction.
   ii) How will the equilibrium be affected if the volume of the vessel containing the three gases is reduced,keeping the temperature constant.What happens ?

9. i) Write the IUPAC nomenclature of :

a) $CH_3CH(OH)CH_2CH_3$ b) $CH_3(CH_2)_4COOH$

ii) Write the Bond line formula of :

a) 2-Methylpropan-2-ol b) Pent-1,4-diene

10. 0.244 g of an organic compound on combustion with dry oxygen produced 0.616 g of CO_2 and 0.108 g of H_2O.Determine the percentage composition of the compound.

11.i) Define Oxidation, Reduction and Identify Oxidation ,Reduction in the given reaction :

$H_2S + Fe^{3+} \longrightarrow Fe^{2+} + S + H^+$

ii) Find the Oxidation number of Phosphorus in NaH_2PO_4.

12. i) What is the effect of temperature on Molarity ?

ii) Find the molecular mass of $Ca(HCO_3)_2$.

iii) What is a limiting reagent ?

13. Enumerate the factors that affect the equilibria of a chemical reaction. [3]

14. i) Complete the chemical reactions : [1+2]

$PbS + H_2O_2 \longrightarrow$

ii) What are Hydrides ? Discuss its Types giving examples of each.

15. What is Smog ? Describe its types and effects . [3]

OR

What is Global warming? What are its consequences ?

16. i) Explain the Photoelectric effect with diagram. [2+1]

ii) State two key points of Bohr's Atomic model.

17. i) Write short notes on positive and negative Resonance effect.

ii) Write the functional isomers of C_3H_6O.

ii) What is Hyperconjugation ?

18. Answer the following : [3]

i) The melting and boiling points of alkaline earth metals are higher than those of alkali metals.Why ?

ii) Identify an element with five electrons in its valence shell.

iii) Why are anions bigger than their parent atoms ?

19. i) State Boyle's law and give its mathematical expression.

ii) What will be the minimum pressure required to compress 500 dm^3 of air at 1 bar to 300 dm^3 at 30^oC ?

20. i) What is a Bomb calorimeter ? [1+2]

ii) Predict in which of the following Entropy increases/decreases – Give reasons.

a) A liquid crystallizes into a solid

b) Temperature of a crystalline solid is raised from 0 K to 115 K.

21. i) $N_2(g) + 3H_2(g) \longrightarrow 2NH_3(g)$; $\Delta_rH^o = -92.4$ kJ mol^{-1}

What is the standard enthalpy of formation of NH_3 gas ?

ii) Define Adiabatic process.

22. Complete and name the following reactions :

i) $C_6H_5COONa + NaOH(CaO/ \Delta) \longrightarrow$

ii) $C_6H_6 + CH_3Cl$ (Anhyd $AlCl_3$) $\longrightarrow$

iii) $CH_3CH=CH_2 + O_3 \longrightarrow$

*23.Calcium forms dipositive ions.It forms compounds with many non-metals.Their compounds are generally ionic.Unlike the salts of alkali metals,those of calcium are not always readily soluble in water.Quick lime,slaked lime,limestone and plaster of paris are some of its popular compounds

a) How will you make slaked lime from quick lime ?
b) What happens when limestone is heated ?
c) Write one laboratory use of slaked lime .
d) Plaster of paris is used to join broken bones.Why ?

24. i) Write short notes on the following : [2+2+1]

a) Conformations of Ethane.

b) Friedel Crafts Acylation reaction.

ii) State Markovnikov's rule and show the products formed on addition of HBr to Propene.

iii) How will you convert Propene to 1,2-Dibromoethane ?

OR

i) Write short notes on the following :

a) Wurtz Reaction

b) β – Elimination reaction.

ii) How will you form Ethene from Calcium carbide starting from $CaCO_3$?

iii) How will you convert Ethene to Ethanol ?

25. i) Define Bond order and bond enthalpy.What is their correlation ? [2+2+1]

ii) Draw the Molecular orbital diagram for Oxygen molecules (O_2). [

iii) What is the basic difference between Electron gain enthalpy and Elecronegativity ?

OR

i) Define Ionization enthalpy.Why is IE_2 very high than IE_1 in Sodium.

ii) Explain the type of Hybridisation in Methane (CH_4).

iii) An electron is in the 3d orbital,give the possible values of all Quantum numbers.

26. i) What are Silicones ? How are they formed ? Write all the reactions. [3+2]

ii) What happens when :

a) Ortho boric acid is heated strongly.
b) Boron trifluoride is treated with Lithium aluminium hydride($LiAlH_4$) in diethyl ether.

OR

i)Borax gives a glassy bead when heated strongly.Write all the reactions involved in it.

Where is it used ?

ii) What are Fullerenes ? How are they prepared ?

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