Shri Shantadurga Higher Secondary School, Bicholim-Goa.

Final Examination March-2018

Std: XI Science **Max Marks : 55**

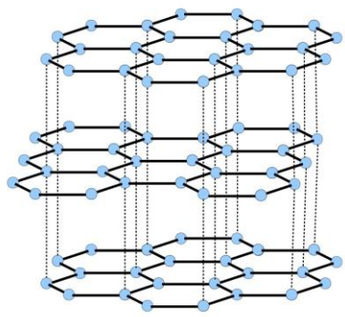
Date: 26/03/2018 **Chemistry** **Duration: 150 Minutes**

Instructions:-

1. All questions are compulsory; however question 21, 26, and 27 has internal choice.
2. Use of calculator is not permitted, however logarithmic table will be provided on request.
3. Every Question should be attempted only once.

Section-A consists of 9 questions of 1 mark each.
Section-B consists of 10 questions of 2 marks each.
Section-C consists of 6 questions of 3 marks each.
Section-D consists of 2 questions of 4 marks each.

	Section-A	
Q.1.	The solubility product expression for tin(II) hydroxide, $Sn(OH)_2$, is_____ # $[Sn^{2+}][OH^-]$ # $[Sn^{2+}]^2[OH^-]$ # $[Sn^{2+}]^3[OH^-]$ # $[Sn^{2+}][OH^-]^2$	(1)
Q.2	The chemical formula of the compound formed when sodium reacts with oxygen is _____ # NaO # Na_3O_2 # Na_2O_2 # Na_2O	(1)
Q.3.	The oxidation state of manganese in $KMnO_4$ is _____ # +5 # +7 # +2 # +4	(1)
Q.4.	Within isomers of alkanes, as the branching increases boiling point _____ #Remains unchanged #Increases #Decreases #First increases and then decreases	(1)
Q.5.	The Enthalpy of a system is represented by_____ # ΔH # E # ΔS # H	(1)
Q.6.	Draw the pH Scale and label Acidic, Basic and Neutral.	(1)
Q.7	Write a balanced chemical reaction illustrating a disproportionation redox reaction.	(1)
Q.8	Draw and name any two isomers of $C_6H_4Br_2$	(1)
Q.9	Draw the Energy level diagram (Enthalpy change) for Endothermic reaction and write the expression for Enthalpy change.	(1)
	Section-B	(2)
Q.10	Write the conjugate bases for the following Brönsted acids: **H_2O, NH_3 , HCO_3^{-1} and HNO_3**	(2)
Q.11	State the first law of thermodynamics and name the instrument used to measure the internal energy change that occurs in a system.	(2)
Q.12	A flask having a volume of 250.0mL and containing air is heated at 100 ˚C and sealed. Then the flask is cooled to 25˚C, immersed in water and opened. What volume of water will be drawn back into the flask? (assuming the pressure constant)	(2)
Q.13	Answer the following with respect to Beryllium: (i) Write a polymeric chain structure of its compound. (ii) Why does Be does not impart any characteristic colour to the flame?	(2)
Q.14	Write any four points of similarities between Lithium and Magnesium.	(2)

Q.15	The standard electrode potential of redox couples is given below: **Fe^{3+}/Fe^{2+} = +0.77V ; $I_{2(s)}/I^-$ = +0.54V ; Cu^{2+}/ Cu = +0.34V; Ag^+/Ag= +0.80V** With the reference to the above values, answer the following: (i) Name the strongest reducing agent. (ii) Calculate the standard EMF of the cell having the following cell representation Cu / Cu^{2+} (0.1M) // Ag^+ (0.1M) / Ag	(2)
Q.16.	Answer the following With reference to the given structure of Allotropic form of Carbon  (i) Name the compound having the above structure (ii) What is the hybridisation of each carbon in this structure (iii)Why this compound can be used as a dry lubricant in machineries. (iv) It is a good conductor of electricity. Give reason	(2)
Q.17.	Name the type of hybridisation formed when one 2s and two 2p orbital overlap and Draw the geometry of this hybrid orbitals.	(2)
Q.18	Write the **l** and **m** values for the following orbitals (i) 3d (ii) 4f	(2)
Q.19	Write the complete electronic configuration for Mn, Co and write the example which is isoelectronic to the given elements.	(2)
	Section-C	
Q.20	Write the IUPAC nomenclature for the following compounds: (i) $CH_3-\underset{\displaystyle OH}{\underset{\vert}{CH}}-CH_2-CH_3$ (ii) $CH_3-CH_2-\overset{\displaystyle O}{\overset{\Vert}{C}}-OH$ (iii) $CH_3-\overset{\displaystyle O}{\overset{\Vert}{C}}-CH_2-CH_3$	(3)
Q.21	Write any two important features of **equilibrium constant** and for the equilibrium system described by $$\mathbf{2\,SO_{2\,(g)} + O_{2\,(g)} \rightleftharpoons 2\,SO_{3\,(g)}}$$ At a particular temperature the equilibrium concentrations of SO_2, O_2 and SO_3 were 0.75 M, 0.30 M, and 0.15 M, respectively. Calculate the **equilibrium constant**, K_c, for the reaction.	(3)

	OR	
Q.21	Write a point of difference between Homogenous and Heterogeneous equilibria and calculate Kc for the following reaction $N_2(g) + O_2(g) \rightleftharpoons 2NO(g)$ Given equilibrium concentrations of $\mathbf{N_2}$=3.0 × 10^{-3}M, $\mathbf{O_2}$ = 4.2 × 10^{-3}M and **NO**= 2.8 × 10^{-3}M in a sealed vessel at 800K	(3)
Q.22	State the **Hess's Law** of Constant Heat Summation and Calculate ΔH_1 **for** the following reaction between sulphur and oxygen which is exothermic in nature. In the direct one step preparation, change in enthalpy ie ΔH **–94.45 Kcal/mol.** $\mathbf{S + 3/2\ O_2 \rightarrow SO_3}$ In this example formation of sulphur trioxide takes place in two steps: In the first step sulphur reacts with oxygen to produce sulphur dioxide $\mathbf{S + O_2 \rightarrow SO_2}$ ΔH_1**= __?___Kcal/mol** In the second step $\mathbf{SO_2}$ reacts with more oxygen to produce $\mathbf{SO_3}$ $\mathbf{SO_2 + 1/2\ O_2 \rightarrow SO_3}$ ΔH_2**= –23.49Kcal/mol**	(3)
Q.23	The standard reduction electrode potential of Ni and Fe are given below Ni^{2+}/ Ni = -0.25V and Fe^{3+}/ Fe = -0.04V (i) Draw a neat labelled diagram of an electrochemical cell with the reference to the given values. (ii) Write the anodic and the cathodic reaction for the same.	(3)
Q.24	Write the complete labelled chemical equation to carry out the following conversions (i) Bromoethane to Butane (ii) Benzene to Nitrobenzene (iii)2-Methylpropane to 2-Methylpropan-2-ol	(3)
Q.25	Answer the following; (i) Name the major and minor product obtained on reaction of hydrogen bromide with propene. (ii) Draw and label Newmann Projections for the two conformations of Ethane. (iii)Write a chemical reaction for the preparation of benzene by any one method.	(3)
	Section-D	
Q.26	With respect to group 13 elements answer the following questions; (i) Name any two important compounds of boron along with their chemical formula (ii) Concentrated HNO_3 can be transported in Aluminium Container. Give reason. (iii)Write a balanced chemical equation showing reaction of Aluminium with nitrogen at a high temperature. (iv)Draw the structure of Diborane. **OR**	(4)

Q.26	With respect to group 14 elements answer the following questions; (i) Write a Balanced chemical equation showing production of water gas (ii) Draw the structure of a silicate unit (iii) Explain why Tetrachlorides of p- block are easily hydrolysed by water? (iv) Write any two uses of Zeolites.	(4)
Q.27	Write complete reaction for the following: (i) $CH_4 + 2O_2 \longrightarrow A + B$ (ii) $CH_3-CH=CH_2 + O_3 \longrightarrow A \xrightarrow{Zn + H_2O} B$ (iii) $H_3C-C\equiv CH + Br_2 \longrightarrow A \xrightarrow{Br_2} B$ (iv)  $+ CH_3Cl \xrightarrow{Anhy.\ AlCl_3} A + B$ **OR**	(4)
Q.27	Write complete reaction for the following: (i) $CH_3(CH_2)_4CH_3 \xrightarrow{Anhy.\ AlCl_3/HCl} A + B$ (ii) $CH_3-CH=CH_2 + H_2O + [O] \xrightarrow{dil\ KMnO_4} A + B$ (iii) $HC\equiv CH + H_2O \xrightarrow[333K]{Hg^{2+}/H^+} A \xrightarrow{isomerisation} B$ (iv)  $+ 6Cl_2 \xrightarrow[Dark,\ cold]{Anhy.\ AlCl_3} A + B$	(4)
	*----------**THE END**----------*	