INDIAN SCHOOL MUSCAT

FINAL TERM EXAMINATION

SET A/B/C

FEBRUARY 2019

CLASS XI

Marking Scheme – CHEMISTRY [THEORY]

Q.NO.	Answers	Marks (with split up)
SET A1 SET B5 SET C2	Ununbium, Uub OR (n-1)$d^{1-10}ns^{1-2}$	½ + ½ 1
SET A2 SET B3 SET C4	BiH_3, SbH_3, AsH_3, PH_3, NH_3	1
SET A3 SET B1 SET C5	4s has lower (n+l) value hence lower energy and filled before 3d	1
SET A4 SET B2 SET C3	4f,14e Or Diagram	½ + ½
SET A5 SET B4 SET C1	Statement	1
SET A6 SET B12 SET C9	Minimum energy required to eject electrons from the surface of a metal Node-3D region around the nucleus where probability of finding electron is zero	1 1
SET A7 SET B11 SET C10	Ethene -sp^2 hybridised[energy level +orbital dia] OR ClF_3-3bp,2lp H_3O^+-3bp,1lp	2 1 1
SET A8 SET B10 SET C11	ΔH = [615+4x414 + 3x498]-[4x741 + 4x464] =-1055kJ/mol OR $\Delta G = \Delta H - T\Delta S$ = 77200-[400x122] = 28400J/mol	½ + ½ +1 ½ + ½ +1
SET A9 SET B9 SET C12	Any two	1 each
SET A10 SET B8 SET C7	a)3-Ethyl-6-methylhept-3-enal b)5-Methylhexan-3-one	1 1
SET A11 SET B7 SET C6	m=1000x3/1000x1.25-3x58.5=2.79moles/kg	½ + ½ +1
SET A12	a) $\lambda=h/mv=6.6\times10^{-34}/2.2\times10^{-3}\times300= 1\times10^{-29}$m	½ + ½

SET B6 SET C8	b) E=hυ=$6.6x10^{-34}x3x10^{15}=19.8x10^{-19}$J	½ + ½
SET A13 SET B20 SET C18	a)Different species with same electronic configuration. Na^+[any one] b) cations have greater effective nuclear charge per e	1+1 1
SET A14 SET B21 SET C19	a) central atom contains more than 8e PCl_5, SF_6 b) NH_3, as the dipoles are arranged along the same direction OR i)any one difference ii)Be_2: $\sigma 1s^2\ \sigma^*1s^2\ \sigma 2s^2\ \sigma^*2s^2$ B.O=4-4/2=0	1+1 ½ + ½ 1 1 1
SET A15 SET B19 SET C23	a) difference b)12-16 compounds are formed by group 12 elements and group 16 elements with a valence of four e OR i) no force of attraction or repulsion between gas molecules/volume of gas are negligible ii) $2xM_{ox}=5x28$ M_{ox}=70g/mol	1+1 1 1 1 1
SET A16 SET B17 SET C15	$d=zM/a^3N_a$ $M=6.22x(4.077x10^{-8})^3x6.022x10^{23}/4=63.459g$ $r=a/2\sqrt{2}=4.077x10^{-8}/2\sqrt{2}=1.4x10^{-8}cm$	½ each
SET A17 SET B18 SET C20	a) At absolute zero, entropy of a perfectly crystalline substance is zero b) derivation $C_p- C_v=R$	1 2
SET A18 SET B15 SET C14	$Cr(OH)_3 \rightarrow CrO_4^{2-}$ $IO_3^- \rightarrow I^-$ $2Cr(OH)_3 + IO_3^- \rightarrow I^- + 2CrO_4^{2-} + 4H^+ + H_2O$ $2Cr(OH)_3 + IO_3^- + 4OH^- \rightarrow I^- + 2CrO_4^{2-} + 5H_2O$	½ ½ 1 1
SET A19 SET B16 SET C13	a) Li due to small size can't stabilize larger peroxide ion b) alkaline earth metals contain two electrons per element to show greater metallic property c) $KHCO_3$ is soluble and can't be precipitated	1 1 1
SET A20 SET B14 SET C16	a) SiO_4^{4-} b) zeolites are aluminosilicates eg: ZSM-5/any eg	1 1+1
SET A21 SET B13 SET C17	a) $P_4 + 3NaOH + 3H_2O \rightarrow PH_3 + 3NaH_2PO_2$ b) $2BF_3 + 6NaH \rightarrow B_2H_6 + 6NaF$ c) $SiO_2 + HF \rightarrow SiF_4 + 2H_2O$ OR Structures	1 1 1 1 each
SET A22 SET B22 SET C24	a)i)carbonates and sulphates of calcium and magnesium ii)hydrogen carbonates of calcium and magnesium b) compounds of hydrogen with p-block elements.	½ + ½ 1

	e rich: H_2O [any two] e deficient: BH_3 e presice : CH_4	½ each
SET A23 SET B24 SET C22	X = C_6H_6, Y=$C_6H_5CH_3$, equations OR equations	1+1+1 1 each
SET A24 SET B23 SET C21	a)BOD is the amount of oxygen required by the bacteria to break down the organic matter present in certain volume of a sample of water. b)When excess of fertilizers are washed into water bodies it causes a dense growth of plant which kills the organisms by depriving them of oxygen and leads to loss of biodiversity- Eutrophication c)Green chemistry is the utilization of the existing knowledge and principles of chemistry to reduce the adverse impact on environment.	1 1 1
SET A25 SET B27 SET C27	a) LeChatelier's b) i)r_f increases ii) r_b increases c) $Kc=2x10^{10}/(0.083x450)^{-1}=74.7x10^{10}$ OR i) solubility product ii)$Mg(OH)_2 \leftrightharpoons Mg^{2+} + 2(OH)^{-}$ $Ksp=[Mg^{2+}][OH^{-}]^2$ iii)pOH=1,pH=13 iv)$\alpha=\sqrt{Ka/c}=\sqrt{5.4x10^{-4}/0.02}=0.1643$	1 1 + 1 ½ +½ +1 1 1 1 ½+ ½ 1
SET A26 SET B26 SET C25	a) Anode:$2CH_3COO^{-} \rightarrow 2CH_3^{\cdot} + 2CO_2$ $2CH_3^{\cdot} \rightarrow C_2H_6$ Cathode : $H_2O + e \rightarrow OH^{-} + H^{\cdot}$ $2H^{\cdot} \rightarrow H_2$ b) Metallic sodium or tollens test c) Cis trans but-2-ene OR i) Propanone and ethanal ii) C_6H_6 iii) Nitration iv) Benzene has 6πe[n=1]	½ each 1 2 2 1 1 1
SET A27 SET B25 SET C26	a) i) to remove interfering cyanide and sulphide ions ii) aniline is high boiling/ steam volatile/immiscible in water iii)Nitro is electron withdrawing and stabilizes the ion by decreasing the e density whereas alkyl group is electron releasing and increases e density and has lesser stability b) Hyperconjugation is defined as delocalization of the σ e of C-H bond of an alkyl group directly attached to an atom of unsaturated system or to an atom with an unshared p orbital.	1 1 1 1

	hyperconjugation in but-1-ene OR i) resonance aniline ii) chain - butanol/2-Methylpropanol/2,2-Dimethylethanol functional-butanol and methoxy propane/ethoxyethane iii) electromeric effect-complete transfer of πe to one of the atoms joined by multiple bonds on the demand of attacking agent.	1 2 1 1 1