INDIAN SCHOOL MUSCAT

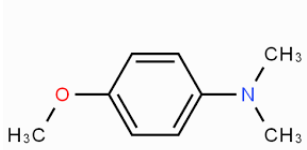
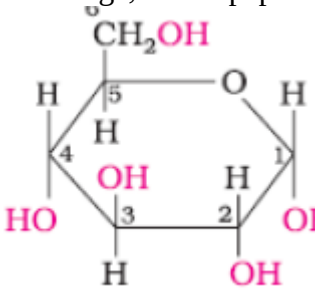
FINAL TERM EXAMINATION

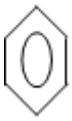
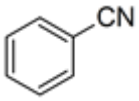
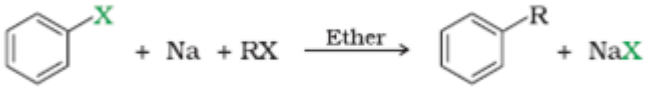
NOVEMBER 2018

SET B

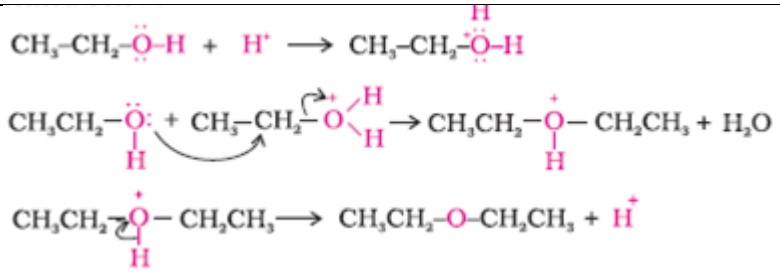
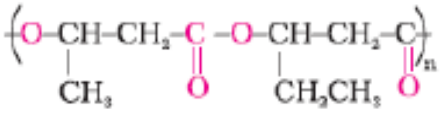
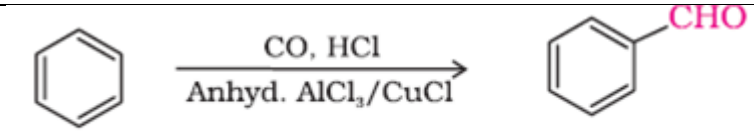
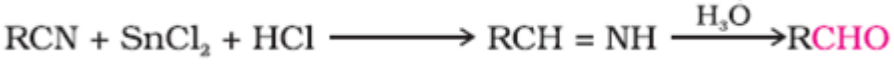
CLASS XII

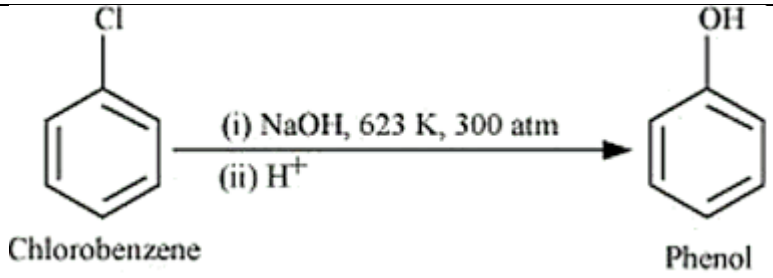
Marking Scheme – CHEMISTRY [THEORY]

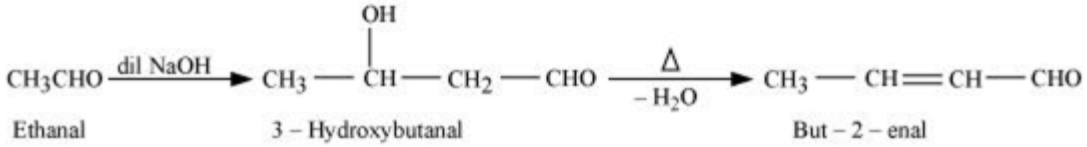
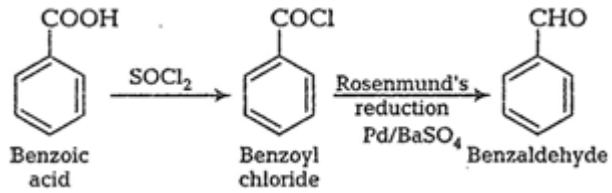
Q.NO.	Answers	Marks (with split up)
1.	$CH_3CH_2CH_2CONH_2$	1
2.	Agonists are drugs that mimic that natural messenger by switching on the receptor. These are used when there is a deficiency of natural messengers.	1
3.	Due to increase in entropy which makes ΔG negative. OR Due to the formation of complex $K_2[HgI_4]$, number of particles decreases.	1
4.	3 F OR to overvoltage/ overpotential Cl^- is oxidised in preference to water.	1
5.	$CH_2=CHCH_2Cl$ (stabilization of cation through conjugation)	1
6.	a) 3-methylpent-4-enal  b)	1 1
7.	Depressants are used to separate two sulphide ores. For example NaCN is used as a depressant in the separation of ZnS from PbS ore. NaCN prevents ZnS from coming to the froth but does not prevent PbS from the formation of the froth.	1 1
8.	a) When two molecules of amino acids combine, the amino group of one molecule reacts with –COOH group of another molecule by losing one water molecule to form a CO-NH linkage, called peptide linkage  b)	1 1
9.	a) Zero order b) $-1/2\Delta[A]/\Delta t=1/2x4.8/20=0.12$bar min^{-1}	1 1
10.	a) Carbylamine reaction ($KCN+CHCl_3$), aniline forms phenyl isocyanide b) $C2H_5NH_2 > C_6H_5NHCH_3 > C_6H_5NH_2 > (C_2H_5)_2NH$	1 1

	OR a)  b) 	1 1
11.	a) In dehydrohalogenation reactions, the preferred product is thatalkene which has the greater number of alkyl groups attached to the doubly bonded carbonatoms b) process of conversion of enantiomer into a racemic mixture is known as racemisation. OR  a) b) The chlorofluorocarbon compounds of methane and ethane are collectively known as freons. Eg CCl_2F_2	1 1 1 1
12.	Homopolymers: These are polymers containing only one type of monomer unit. E.g.: polythene/ polystyrene/ polypropene etc. Copolymers: These are polymers containing different types of monomer units. E.g.: glyptal/terylene./ Nylon-6,/Nylon-6,6	½+½ ½+½
13.	$\rho = \frac{Z \times M}{a3 \times N a}$ $a3 = \frac{4 \times 207}{11.35 \times 6.02 \times 10^{23}}$ $= 4.949 \times 10^{-8}$ cm=494.9 cm $r = \frac{a}{2\sqrt{2}}$ $= \frac{494.9}{2\sqrt{2}}$ =174.95 pm	½ 1 ½ 1
14.	a) Gives the position of constituent particles in crystal lattice b) (i) having a physical property which has the same value when measured in different directions. (ii) In antiferromagnetic, the domains are oppositively oriented and cancel each other. So they have no net magnetic moment. In ferromagnetic the domains are arranged in opposite	1 1 1

	directions but in unequal numbers. So they have a net magnetic momen	
15.	Observed molar mass ,$M_B=\frac{Kf \times wB}{\Delta Tf \times wA} = \frac{5.13X0.2}{0.45X0.03}$=113.8g/mol Observed molar mass ,M_B= = =113.8g/mol Molar mass of CH_3COOH=60 g /mol Van't Hoff factor = = 0.53 **OR** $p_{total}= p_A^o\chi_A + p_B^o\chi_B$ 600=450 x χ_A +700(1-χ_A) χ_A=0.4 χ_B=0.6 $P_A= p_A^o\chi_A$ =450X0.4=1800 $P_B= p_B^o\chi_B$ =700x0.6=420 y_A =P_A/p =180/600=0.3 y_B=420/600=0.7	1 1 1 1 1 1
16.	a) it forms CaO and CO_2.CaO combines with silica to form slag.CO_2 forms CO used as reducing agent b) CO forms a volatile compound with Ni which on decomposition gives pure Ni c) removes FeO as slag $FeSiO_3$	1 1 1
17.	a) Constant boiling mixtures without change in composition b) Shows positive deviation from Raoults law Due to weakening of molecular interactions between ethanol molecules by acetone c) B since it is less soluble.	1 ½+½ ½+½
18.	a) Phenacetin is an antipyretic, while the rest are tranquilizers. b) 0.2% solution of phenol acts as antiseptic whereas 1% solution of phenol acts as disinfectant. c) Carbohydrates, proteins, nucleic acids, lipids (any two) OR a) Antihistamine, They compete with histamine for the binding sites of receptors ans act as antiallergics. b) Antidepressants ,inhibit the enzymes that catalyse degradation of noradrenaline c) Antibiotic, drugs used to kill or inhibit growth of microorganisms	1 ½ ½+½ 1 1 1

19.		1 1 1
	OR	1
	a) -I effect & stabilization of anion formed.	
	b) Less surface area of contact and Vander Waals forces decreases	1
	c) Elimination is favoured over substitution, and alkenes are formed	1
20.	a) aryl amines, the -NH_2 group is attached directly to the benzene ring. So the lone pair electrons present in the nitrogen atom enter into the benzene ring and in alkyl amines electron density is more due to +I effect of alkyl gp.	1
	b) The lp on N will involve in resonance with CO gp which reduces electron density on N	1
	c) anilinium ion is meta directing	1
21.	a) During the formation of a disaccharide or polysaccharide, the monosaccharides are joined together through oxide linkage by losing water molecule	1 1
	b) They are stereo isomers which differ only in the configuration at the first carbon	
	c) These are carbohydrates which give two to ten monosaccharide units on hydrolysis	½+½
22.	a) Buta-1,3- diene& propenenitrile,CH_2=CH-CH=CH_2,CH_2=CHCN	½+½
	b) Tetraflouroethene,CF_2=CF_2	½+½
	c) Ethyleneglycol & Terephthalic acid,	½+½
		
	OR	
	a) These are polymers which can be decomposed by micro organisms	1
	b) Poly β-hydroxybutyrate – co-β-hydroxy valerate (PHBV):	1
	c) 	1
23.		1
	a) Benzene Benzaldehyde	
	b) 	1

	c) 	1
24.	a) 	1
	b) Allyl bromide is formed,CH2Cl CH=CH2	1
	c) R-X + NaI→ R-I + NaX (Finkelstein reaction)	1
25.	a) No of collisions/sec/unit volume of the reaction mixture. b) Rate of a reaction when centration of reactants is unity.	1 1
	a) $t_{1/2} = \frac{0.693}{K} = 0.693/2.2\times10^{-5} = 3.15\times10^{4}$ s	
	$K = \frac{2.303}{t} \log \frac{[A]o}{[A]}$	½ ½
	$\log \frac{[A]o}{[A]} = \frac{2.2\times10^{-5}\times90\times60}{2.303} = 0.05158$	
	$\frac{[A]o}{[A]}$ =antilog 0.05158=1.126	
	$[A] = \frac{[A_0]}{1.126} = 0.888 = 88.80\%$ 11.2% of SO_2Cl_2 would decompose on heating for 90 mnts	1 ½+½
	OR	
	a) Reactions which appears to be of higher order but becomes reactions of 1st order under certain conditions are called pseudo order reactions. b) It is the no: of reacting species involved in simultaneous collision during a reaction	1 1

	c) $\text{Log}\frac{k2}{k1} = \frac{Ea}{2.303\,R}\left(\frac{1}{T1} - \frac{1}{T2}\right)$ $\log\frac{k2}{7.87x10-7} = \frac{103x1000}{2.303x8.314}\left(\frac{1}{273} - \frac{1}{293}\right)$ $= \log\frac{k2}{7.87x10-7} = 1.345$ $\frac{k2}{7.87x10-7}$ =antilog 1.345=22.13 k=22.13x7.87x10^{-7}=**1.74x10^{-5} s^{-1}**	½ 1 1
26.	a)  b)  (i) (A) $CH_3–CH_2–CH_2–CHO$ (B) $CH_3–\overset{\overset{O}{\|}}{C}–CH_2–CH_3$ (C) $CH_3–\overset{\overset{CH_3}{\|}}{CH}–\overset{\overset{O}{\|}}{C}–H$ (D) $CH_3–CH_2–CH_2–CH_3$ (ii) Since B is a ketone it will be less reactive due to +I effect and steric hindrance OR a) $(CH_3)_3CCHO$, absence of α Hydrogen b) (i) $CHI_3+C_6H_5COONa$ (ii) $CH_3CH(OH)CH_2COOC_2H_5$ c)	1 1 4x ½ ½+½ ½ +½ 1 1

	(i) EWG stabilizes the carboxylate ions &acidic character increases (ii) Aldehydes and Ketones form addition compounds with $NaHSO_3$ whereas impurities do not. On hydrolysis we get pure aldehydes and ketones back	1 1
27.	a) cells cannot be recharged and used again. Eg: dry cell a) $2PbSO_4 + 2H_2O \rightarrow Pb + PbO_2 + 2H_2SO_4$ $\lambda_m = \frac{1000 \times K}{C}$ $= \frac{1000x5.25x10-5}{2.5x10-4} = 210\ scm^2mol^{-1}$ $\lambda^o_{HCOOH} = 394.5 + 50.5 = 400\ scm^2mol^{-1}$ $\alpha = \frac{\lambda m}{\lambda 0 m} = 210/400 = 0.525 = 52.5\%$ **OR** a) The amount of substance deposited or liberate at an electrode is directly proportional to the quantity of electricity passed through the electrolytic solution b) Electrode potential/Concentration of ions /Overvoltage /Nature of electrode c) Thus, number of electrons involved = n = 2 $\Delta G^0 = - nFE^0$ $= -2 \times 96500 \times 0.236$ $= 45548\ J\ mol^{-1}$ $= 45.548\ kJ\ mol^{-1}$ $\Delta G^0 = - nFE^0$ $= -2.303\ RT \log K_{eq}$ $\log K_{eq} = \frac{nFE^\circ}{2.303\ RT}$ $= \frac{45548}{2.303 \times 8.3143 \times 298}$ $\log K_{eq} = 7.9824$ K_{eq} = Antilog of 7.9824 $= 9.60282 \times 10^7$	1 1 ½ 1 ½ 1 1 ½+½ ½ 1 ½ 1

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