FIRST TERM EXAMINATION

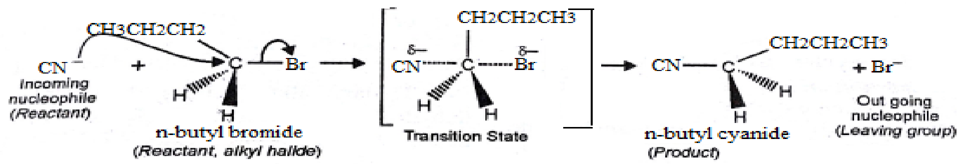
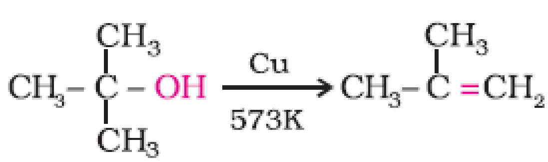
APRIL/MAY 2018

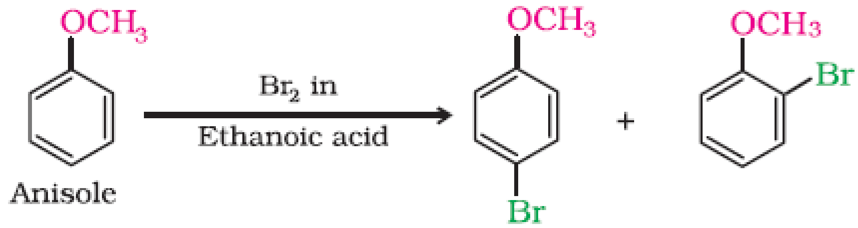
CLASS XII

Marking Scheme – SUBJECT[CHEMISTRY][THEORY]

Q.NO.	Answers	Marks (with split up)
1.	$4AgNO_3 + H_3PO_2 + 2H_2O \rightarrow 4Ag + HNO_3 + H_3PO_4$	**1**
2.	4	**1**
3.	Catalytic hydrogenation of CO in presence of ZnO&Cr_2O_3 at high temp &pressure	**1**
4.	CH_3I bcs I^- is a good leaving group.	**1**
5.	H-bonding between O atom of ethoxy ethane and H atoms of water	**1**
6.	The brown ring test for nitrates depends on the ability of Fe2+ to reduce nitrates to nitric oxide, which reacts with Fe2+ to form a brown coloured complex Explanation with equations OR The optimum conditions for the production of ammonia are a pressure of about 200 atm, a temperature of ~ 700 K and the use of a catalyst such as iron oxide with small amounts of K_2O and Al_2O_3 Balanced chemical equation	**1** **1** **1+1**
7.	a) PH_3 b) NH_3 c) SbH_3 d) NH_3	**2**
8.	a) 2-Methyl-1-Phenyl-hex-4-en-2-ol	**2**

	b) 1-chloro-4-isobutylbenzene	
9.	a) Aq $KOH+HNO_3+AgNO_3$ -benzyl chloride gives white ppt b) Phenol gives violet colour with neutral $FeCl_3$	**2**
10.	Correct structural formulae	**2**
11.	a) Phenol&iodoethane are formed b) 2-methyl propene is formed	**2**
12.	Test for distinguishing alcohols,Equation explanation	**1** **1**
13.	Ostwalds Process conditions Balanced Equations **OR** Any 3 points of differences (1x3)	½ ½
14.	Balanced chemical equations a) $H_3PO_3 + 3HCl$ b) $P_4+8SOCl_2 \rightarrow 4PCl_3 +4SO_2 +2S_2Cl_2$ c) $Cu + HNO_3(conc.) \rightarrow Cu(NO_3)_2 + 2NO_2 + 2H_2O$	**3x1**
15.	Correct structures	**3X1**
16.	a) Steric repulsion between bulky alkyl gps b) Resonance effect/sp2 hybridised Carbon /O-H bond is more polar c) Intramolecular Hydrogen bonding in o-nitrophenol&inter molecular hydrogen bonding in p-nitrophenol	**3x1**
17.	Hydration of ethene to ethanol (i) $CH_2=CH_2 {}^{+} H^+ \rightarrow CH_3CH_2^+$ (ii) $CH_3CH_2^+ + H_2O \rightarrow CH_3CH_2OH_2^+$ (iii) $CH_3CH_2OH_2^+ \rightarrow CH_3CH_2OH + H^+$	**3x1**
18.	A is C_2H_5OH, B is C_2H_5Cl Chemical equations	½+½ **1+1**
19.	Hydroboration –oxidation.-Alcohols Reimer-Tiemann reaction-Salicylaldehyde	**1+1+1**

	Wiilliamsons synthesis-Ethers Chemical equations	
20.	a) CH_3-*CHCl-CH_2-CH_3 b) The given reaction is an SN^2 reaction.  	1 2
21.	a) Cl_2+$FeCl_3$ followed by acylation b) Alc KOH followed by Markovnikovs addition of HBr. c) Diazotization followed by KI	3x1
22.	Correct definitions	3x1
23.	a) Nitroethane is formed b) 2,4,6-trinitrophenol c) 3-bromocyclohexene is formed	3x1
24.	a) Chloroform is slowly oxidised by air in the presence of light to carbonyl chloride, also known as phosgene b) Partial double bond character of C-O bond due to resonance. c) Less energy is released when new attractions are set up between the haloalkane and the water molecules as these are not as strong as the original hydrogen bonds in water	3x1
25.	a) i.  	5x1

ii. 

iii. $CH_3CHOHCH_3 \xrightarrow{CrO_3} CH_3COCH_3$

b)

i. o-Cresol , phenol , 3,5-dinitrophenol , 2,4,6-trinitrophenol

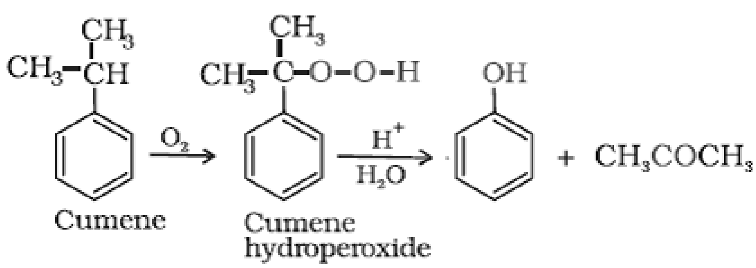
ii. n-butane, Ethoxyethane, Pentanal, Pentan-1-ol

OR

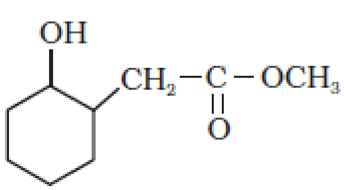
a)

i. Kolbe's reaction followed by acetylation.

ii. PCC,&CH_3MgBr

iii. 

b)

i. 

	ii. $CH_3 - CH = CH_2 + H_2O$	
26.	(A)Toluene, (B)-Benzyl chloride (C)-Benzyl cyanide (D)-2-phenylethanoicacid (E) - 1,2-Diphenylethane chemical reactions OR a) i) Swarts reaction. ii) Finkelstein reaction. iii) Friedel- crafts acylation of chlorobenzene b) i) Zaitsev rule,But-2-ene ii) Antimarkovnikovs addn,1-bromobutane	**½x5=2.5** **½x3=1.5** **1** **3x1** **2x1**
27.	a) $P4+3NaOH+3H_2O \rightarrow PH_3+3NaH_2PO_2$ b) $PH_4I + KOH \rightarrow KI + H_2O + PH_3$ c) The solution of PH_3 in water decomposes in presence of light giving red phosphorus and H_2, $3CuSO_4 + 2PH_3 \rightarrow Cu_3P_2 + 3H_2SO_4$ d) $PH_3 + HBr \rightarrow PH_4 Br$ **OR** a) Absence of d orbitals b) Presence of lone pair of electrons c) PH_4^+ is tetrahedral and PH_3 is pyramidal d) Due to high BDE e) Due to Inert pair effect	**1x5** **1x5**

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