Hydrocarbons

1. SUB TOPIC NAME: ALKANES

1.	Isopropyl bromic	le on wurtz r	eaction gives			
	1) Hexane		2) Propane			
	3) 2, 3-dimethyl b	utane	4) Neohexa	ane	-0	
2.	Heating a mixtur	e of sodium k	enzoate and	soda lime give	es	
	1) Benzene 2)	Methane 3) S	Sodium benzoa	ate 4) Calciur	n benzoate	
3.	n-Octane when h	eated to 773	k under a pro	essure of 10-20	0 atm and in	presence
	of a mixture of C	r ₂ O ₃ , V ₂ O ₅ aı	nd Mo ₂ O ₃ sup	ported over A	Al ₂ O ₃ as cataly	st gives
	1) o – Xylene	2) m – Xyle	ene 3) p	– Xylene	4) All the th	ree
4.	The dihedral ang	gle between t	wo C-H bon	ds in the stage	gered conforn	nation of
	ethane is					
	1) 180°	2) 0		3) 120°		4) 60°
5.	Which of the fol	lowing has l	east hindered	d rotation abo	out Carbon -	- Carbon
	bond?	C				
	1) Ethane	2) Ethylene	e 3) A	cetylene	4) Hexachlo	roethane
6.	Which of the fol	lowing alkar	ne has lowest	boiling poin	t and highest	melting
	point?					
	1) n – Pentane	2) Is	opentane	3) Neopenta	ne 4) n -	- Hexane
7.	$CH_3CH_3 + HNO_3 -$	675 K				
	1) <i>CH</i> ₃ <i>CH</i> ₂ <i>NO</i> ₂	2) <i>CH</i> ₃ <i>CH</i> ₂	$NO_2 + CH_3NO_2$	3) 2CH ₃ NO ₂	4) $CH_2 = CE$	I_2
8.	Consider the follo	owing reactio	n,			
	H_3C - CH -	$^{\circ}H_3 + \overset{\bullet}{B}r \rightarrow ^{\circ}X$	'+ <i>HBr</i>			

Identify the structure of the major product 'X'

1)
$$CH_3 - CH - CH - \stackrel{\bullet}{C}H_2$$

2)
$$CH_3 - CH - \overset{\bullet}{C} - CH_3$$

3)
$$CH_3 - \overset{\bullet}{C} - CH - CH_3$$

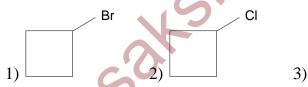
1)
$$CH_{3} - CH - CH - \stackrel{\bullet}{C}H_{2}$$
 2) $CH_{3} - CH - \stackrel{\bullet}{C} - CH_{3}$ 3) $CH_{3} - \stackrel{\bullet}{C} - CH - CH_{3}$ 4) $CH_{3} - \stackrel{\bullet}{C}H - CH - CH_{3}$ $\stackrel{\bullet}{C}H_{3}$

- 9. On mixing certain alkane with chlorine and irradiating it with ultraviolet light, one forms only one mono chloroalkane. The alkane could be
 - 1) Neopentane
- 2) Propane
- 3) Pentane
- 4) Isopentane
- 10. Which of the following has the minimum boiling point?
 - 1) n-Butane
- 2) 1-Butyne
- 3) 1-Butene
- 4) 1-Isobutene
- 11. Of the five isomeric hexanes, the isomer which can give two monochlorinated compounds is
 - 1) n-hexane

2) 2, 3-dimethylbutane

3) 2, 2-dimethylbutane

- 4) 2-methyl pentane
- What will be the product formed when 1-bromo-3-chlorocyclo butane reacts **12.** with two equivalents of metallic sodium in ether?





- Enthalpy of hydrogenation of cyclohexene is -119.5 kJ mol⁻¹, its enthalpy of **13.** hydrogenation would be
 - 1) -358.5 kJ mol⁻¹ 2) -508.9 kJ mol⁻¹ 3) -208.1 kJ mol⁻¹ 4) -269.9 kJ mol⁻¹

- Phenyl magnesium bromide reacts with methanol to give
 - 1) A mixture of anisole and Mg (OH) Br 2) A mixture of benzene and Mg(OMe)Br
 - 3) A mixture of toluene and Mg (OH) Br 4) A mixture of Phenol and Mg(OMe)Br

15.	Increasing order of stability among the three main conformations (i.e., eclipse,				
	anti, gauche) of 2-f	louroethanal is			
	1) Eclipse, anti, gau	che	2) Anti, gauche, eclipse		
	3) Eclipse, gauche,	anti	4) Gauche, eclipse,	anti	
16.	An alkyl halide by	formation of its G	Frignard reagent an	nd heating with water	
	gives propane. Wh	at is the original all	kyl halide?		
	1) Methyl iodide	2) Ethyl iodide	3) Ethyl bromide	4) Propyl bromide	
17.	The number of str	uctural isomers for	C_6H_{14} is		
	1) 3	2) 4	3) 5	4) 6	
18.	$CH_3CH_2CH_2CH_3$	$\xrightarrow{catalyst} CH_3 - CH - CH$	3		
	The cotolinat wood:	CH ₃	stom to		
		n the above convers			
	1) <i>ZnCl</i> ₂ / <i>HCl</i>			Cl 4) CuCl/HCl	
19.				imum and maximum	
	number of mono c	hloro derivatives ar	e respectively		
	1) 3-methyl pentane	e and 2, 3-dimethyl b	utane		
	2) 2, 3-dimethyl but	tane and n-hexane			
	3) 2, 2- dimethyl bu	tane and 2-methyl po	entane		
	4) 2, 3- dimethyl bu	tane and 2-methylpe	ntane		
20.	Isomers which car	n be inter converted	d through rotation	around a single bond	
	are				
	1) Conformers		2) Diastereo	mers	
	3) Enantiomers		4) Positional	lisomers	
21.	Main constituent o	of LPG is			
	1) Methane 2) Isobu	utane, Propane 3) H ₂	2, CH ₄ , Isobutane 4)	None of these	
22.	The reaction condi	tions leading to bes	t yields of C ₂ H ₅ Cl a	re	
	1) $C_6H_6(excess) + Cl$	$\frac{UV light}{2}$	$2) C_6H_6 + Cl_2 - \frac{Date}{roomt}$	\xrightarrow{rk}	
	3) $C_6H_6 + Cl_2(excess)$	$) \xrightarrow{UV \ light} \rightarrow$	4) $C_6H_6 + Cl_2 - UV list$	\xrightarrow{ght}	

23.	2.84 g of meth	yl iodide was compl	etely converted in	nto methyl magnesiu	ım
	iodide and the	product was decomp	osed by excess of	ethanol. The volume	of
	the gaseous hyd	rocarbon produced a	t NTP will be		
	1) 22.4 liter	2) 22400 mL	3) 0.448 liter	4) 0.224 liter	
24.	The IUPAC nan	ne of neo-pentane is			
	1) 2-methyl butar	ne	2) 2, 2-dimethyl l	outane	•
	3) 2-methyl prop	ane	4) 2, 2-dimethyl J	propane	
25.	Which of the fo	llowing is the correct	t sequence of steps	s in the halogenation	of
	an alkane?				
	1) Propagation, in	nitiation, termination	. (
	2) Initiation, term	nination, propagation	*//		
	3) Initiation, prop	pagation, termination			
	4) Propagation, to	ermination, initiation			
26.	Which of the fo	llowing alkanes can	be synthesized in g	good yield by the wur	rtz
	reaction?		3		
		$CH_2 - CH(CH_3)_2$	$2) \left(CH_3 \right)_2 CH - C$	$CH_2CH_2-CH(CH_3)_2$	
	3) $CH_3CH_2 - C(C$	$(CH_3)_2 - CH_2CH_3$	$4) \left(CH_3\right)_3 C - CH_3$	$_2$ $-CH_2$ $-CH_3$	
27.	An alkane with	a molecular formula	C_6H_{14} reacts with C_6H_{14}	chlorine in the presen	ıce
	of light and he	eat to give two con	stitutionally isom	eric monochlorides	of
	monochlorides	of molecular formula	a, $C_6H_{13}Cl$. What	is the most reasonal	ole
	starting alkane?				
	1) n-Hexane		2) 2, 2-dimethyl l	outane	
	3) 2, 3-dimethyl	butane	4) 3-methyl penta	ine	
28.	$(CH_3)_3 C - MgCl$	on reaction with D ₂ C	produces		
	1) $\left(CH_3\right)_3 CD$	$2) \left(CH_{3} \right)_{3} OD$	3) $\left(CD_3\right)_3$	CD 4) $(CD_3)_3 OD$	D

- **29.** Which one of the following is reduced with zinc and hydrochloride acid to give the corresponding hydrocarbon? 1) Ethyl acetate 2) Acetic acid 3) Acetamide 4) Butan-2-one
- **30.** 2-Methyl butane on reacting with bromine in the presence of sunlight gives mainly,
 - 1) 1-bromo-2-methylbutane

2) 2-bromo-2-methylbutane

3) 2-bromo-3-methylbutane

4) 1-bromo-3-methylbutane

31. The treatment of CH₃MgX with $CH_3 - C \equiv C - H$ produces:

1) CH₄

2) $CH_3HC = CH_2$ 3) $CH_3 - C = C - CH_3$ 4) $CH_3HC = CHCH_3$

KEY

6) 3 1) 3 2) 1 3) 4 4) 4 5) 1 10) 1

11) 2 12) 4 13) 3 14) 2 15) 1 16) 4 17) 3 18) 2 19) 4 20) 1

2. SUB TOPIC NAME: ALKENES

- Among the alkenes which one produces tertiary butyl alcohol on acid 1. hydration?
 - 1) $CH_3 CH_2 CH = CH_2$

2) $CH_3 CH = CH CH_3$

3) $(CH_3)_2 C = CH_2$

4) $CH_3 CH = CH_2$

Ozonolysis of an organic compound gives formaldehyde as one of the products. This confirms the presence of

1) A vinyl group

2) Two ethylenic double bonds

3) An isopropyl group

4) An acetylenic triple bond

3. Which of the following reactions will yield 2, 2-dibromo propane?

1)
$$H_2C = CHBr + HBr$$

2)
$$CH_3C \equiv CCH_3 + 2HBr$$

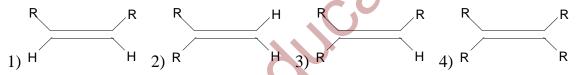
3)
$$CH_3C \equiv CH + 2HBr$$

4)
$$CH_2CH = CHBr + 2HBr$$

4. Which of the following reagents will you choose for the given reaction?

$$H_2C = CH_2 + H_2O + O \rightarrow H_2 \stackrel{C}{\underset{OH}{\leftarrow}} - \stackrel{C}{\underset{OH}{\leftarrow}} H_2$$

- 1) Dil.KMnO₄, 273 k
- 2) Alkaline KMnO₄, high temperature
- 3) Acid and K₂Cr₂O₇ at room temperature
- 4) Acid and KMnO₄ at room temperature
- 5. Which one of the following alkenes will react faster with H_2 under catalytic hydrogenation condition?



6. The reaction of propene with HOCl proceeds via the addition of

7. Identify the set of reagents / reaction conditions 'X' and 'Y' in the following set of transformations:

$$CH_3CH_2CH_2Br \xrightarrow{Y} Product \xrightarrow{Y} CH_3 - CH_3 - CH_3$$

- 1) X = dilute aqueous NaOH, 20°C, Y = HBr/acetic acid, 20°C
- 2) X = Conc.alcoholic NaOH, 80°C, Y = HBr/acetic acid, 20°C
- 3) $X = \text{dilute aqueous NaOH, } 20^{\circ}\text{C}, Y = \text{Br}_2/\text{CCl}_3, 0^{\circ}\text{C}$
- 4) $X = \text{Conc.alcoholic NaOH}, 80^{\circ}\text{C}, Y = \text{Br}_2/\text{CHCl}_3, 0^{\circ}\text{C}$
- 8. In the presence of peroxide, hydrogen chloride and hydrogen iodide do not give anti-Markownikoff's addition to alkenes because
 - 1) Both are highly ionic.

	2) One is oxidizing and other is reducing.				
	3) One of the steps	is endothermic in bo	oth the cases.		
	4) All the steps are	exothermic in both t	he cases.		
9.	Which of the fol	lowing used for tl	he conversion	of 2-hexyne into trans-2-	
	hexene?				
	1) H ₂ /Pd / BaSO ₄	2) H ₂ , PtO ₂	3) NaBH ₄	4) Li-NH ₃ / C ₂ H ₅ OH	
10.	When 2-butyne is	treated with P-BaS	O ₄ ; the product	t formed will be	
	1) cis-2-butene	2) trans-2-butene	3) 1-butene	4) 2-hydroxy butane	
11.	Reaction of one m	ole of HBr with one	e molecule of 1,	3-butadiene at 40°C gives	
	predominantly				
	1) 3-boromo butane	e under kinetically co	ontrolled conditi	ons	
	2) 1-bromo-2-buter	ne under thermodyna	mically controll	ed conditions	
	3) 3-bromobutene u	under thermodynami	cally controlled	conditions	
	4) 1-bromo-2-buter	ne under kinetically	controlled condit	tions	
12.	Acid catalyzed hy	dration of alkenes e	except ethane le	ads to the formation of	
	1) Primary alcohol	.0			
	2) Secondary or ter	tiary alcohol			
	3) Mixture of prima	ary and secondary al	cohols		
	4) Mixture of second	ndary and tertiary alc	cohols		
13.	Elimination of bro	omine from 2-brom	o butane results	s in the formation of	
	1) Equimolar mixtu	are of 1 and 2-butene	e 2) Pred	ominantly-2-butene	
	3) Predominantly-1	-butene	4) Pred	ominantly-2-butyne	
14.	Addition of Br ₂ to	Z-but-2-ene gives			
	1) $(R, R) - 2$, 3-di l	bromobutane only			
	2) $(S, S) - 2$, 3-dib	romobutane only			
	3) $(R, S) - 2$, 3-di b	promobutane only			
	4) a mixture of (R,	R) and (S, S)-2, 3-di	bromo butanes ((50%:50%)	
15.	The Markownikof	ff's rule is best appl	icable to the rea	action between	
	$1) C_2H_4 + HCl$	2) $C_3H_6 + B$	$3r_2$		

	$3) C_3H_6 + HBr$	4) $C_3H_8 + Cl_2$	5) $C_2H_4 + I_2$	
16.	An alkene on reductive	ozonolysis give	es two molecules	of CH_2 (CHO) 2. The
	alkene is			
	1) 2, 4-hexadiene	2	2) 1, 3-cyclo hexad	liene
	3) 1, 4-cyclo hexadiene	4	1) 1-methyl-1, 3-cy	yclopentadiene
17.	HBr reacts with $H_2C =$	CH – OCH ₃	under anhydrou	s conditions at room
	temperature to give			
	1) CH ₃ CHO and CH ₃ Br	2	2) BrCH ₂ CHO and	I CH₃OH
	3) $BrCH_2 - CH_2 - OCH_3$	4	4) H ₃ C – CHBr – 0	OCH ₃
18.	Reaction of trans-2-phe	nyl-1-bromo cy	clopentane on r	eaction with alcoholic
	KOH produces		XIC	
	1) 4-phenyl cyclopentene	2	2) 2- phenyl cyclop	pentene
	3) 1- phenyl cyclopentene	4	4) 3- phenyl cyclop	pentene
19.	Ozonolysis products	of an old	efin are OH	C - CHO and
	$\mathbf{OHC} - \mathbf{CH_2} - \mathbf{CH_2} - \mathbf{CH}$	O, the defin is		
	1) 2)		3)	4)
20.			,	ne overlap of sp ² and s
	orbitals ; (ii) one sig		_	_
	(iii) one π -bond formed			
	1) C_2H_6 2) C_2			
21.	Identify 'B' in the follow		,, 6,11,61,	+) C ₂ 11 ₄
41 •		C	n-Cu (P) HC1	
	$H_2C = CH_2 + HCl$ — Anhyd.AIC			
	•		C_2H_5Cl	4) C_2H_5OH
22.	Which of the following is			
	1) $R_2C = CR_2$ 2) RC	CH = CHR 3	$RCH = CH_2$	4) H2C = CH2
23.	Oxidation of 1-butene wi	th hot KMnO ₄	solution produce	s:
	1) $CH_3CH_2COOH + HCO$	OH	2) $CH_3CH_2CH_3$	$COOH + CO_2$

	3) $CH_3COOH + C$	CO_2	4) (0	$(CH_3)_2 C = O + C$	CO_2
24.	One molecule o	of alkene 'X' on o	zonolysis gav	e one mole of	f acetone. The
	IUPAC name of	'X' is			
	1) 2-methyl-1-but	tene 2) 2-methy	yl-2-butene	3) 2-butene	4) 1-butene
25.	The order of read	ctivity of the alkene	es,		
	$(CH_3)_2 C = CH_2,$	$CH_3CH = CH_2, H_2C$	$= CH_2$		
	I	II III			
	When subjected	to acid catalyzed hy	ydration is		
	1) I > II > III	2) I > III > II	3) III > II >	• I 4) II >	> I > III
26.	Which of the foll	lowing has lowest be	oiling point?		
	1) $CH_3CH_2CH = 0$	CH CH ₃	2) CH ₃ CH ₂	CH ₂ CH ₂ CH ₃	
	3) H2C = CH - CH	H ₂ CH - CH ₂	4) $CH_3 - C_6$	$= C - CH_3$ CH_3	
27.	One mole of a	symmetrical alker	ne on ozonol	ysis gives two	moles of an
	aldehyde having	a molecular mass o	of 44u. The alk	kene is	
	1) Ethane	2) Propene	3) 1-butene	4) 2-b	outene
28.	But-1-ene may b	e converted to buta	ne by a reacti	on with	
	1) Zn-HCl	2) Sn – HCl	3) Zn – Hg	4) Pd	/ H ₂
29.	The most stable	alkene is			
	$1) R_2C = CR_2$	2) RCH = CHR	$3) H_2C = C$	$^{\circ}H_{2}$	4) $RCH = CR_2$
30.	An alkene on v	igorous oxidation	with KMnO ₄	gives only ac	cetic acid. The
	alkene is				
	1) CH ₃ CH ₂ CH =	= CH ₂	2) CH ₃ CH	= CH CH ₃	
	3) $(CH_3)_2 C = CH$	I_2	4) CH ₃ CH	$= CH_2$	
31.	In the following	sequence of reaction	ns, the alkene	affords the cor	npound 'B'
	$CH_3CH = CHCH_3$	$\xrightarrow{O_3} A \xrightarrow{H_2O} B \cdot \mathbf{T}$	he compound	'B' is	
	1) CH ₃ CH ₂ CHO	2) CH ₃ COCH ₃	3) CH ₃ CH ₂	$COCH_3$ 4)	CH₃CHO
32.	Which one of the	e following gives, on	ozonolysis, b	oth aldehydes	and ketones?

 $2) Me_2C = CMe_2$

1) $Me_2C = CHMe$

- 3) $MeCH_2$ - $C(Me) = CMe_2$
- 4) MeCH(Me) CH = CH Me
- - 1) Mesodiol
- 2) Racemic diol
- 3) Both (a) and (b)
- 4) Ketodiol

34. Following compound is treated with NBS

$$CH_2CH = CH_2 + NBS \rightarrow A$$

, compound formed 'A' is

$$\begin{array}{c} \text{CH-CH} = \text{CH}_2 \\ \text{Br} \end{array}$$

 $CH = CH CH_2 Br$

$$CH_2 CH = CH_2$$

Br

- 35. Order of reactivity of C_2H_6 , C_2H_4 and C_2H_2 is
 - 1) $C_2H_6 > C_2H_4 > C_2H_2$

2) $C_2H_2 > C_2H_6 > C_2H_4$

3) $C_2H_4 > C_2H_2 > C_2H_6$

4) All are equally reactive

KEY

- 1) 3 2) 1 3) 3 4) 1 5) 1 6) 2 7) 2 8) 3 9) 4 10) 1 11) 2 12)2
- 13) 2 14) 4 15) 3 16) 3 17) 4 18) 4 19) 3 20) 4 21) 2 22) 1 23) 2 24)2
- 25) 3 26) 4 27) 4 28) 4 29) 1 30) 2 31) 4 32) 1 33) 1 34) 2 35) 3

3. SUB TOPIC NAME: ALKYNES

1.	Which	compound	does	not	give	precipitate	with	ammonical	silver	nitrate
	solution	n?								

$$1) \quad C_2H_5 - C \equiv CH$$

2)
$$CH_3 - C \equiv C - CH_3$$

3)
$$CH_3 - C \equiv CH + C \equiv CH$$
 4) $Ph - CH_2 - C \equiv CH$

4)
$$Ph - CH_2 - C \equiv CH$$

The treatment of CH₃MgX with $CH_3C \equiv CH$ produces 2.

1)
$$CH_3 - CH = CH_2$$
 2) $CH_3C = CCH_3$ 3) $CH_3 - C = C - CH_3$

3)
$$CH_3 - C = C - CH_3$$

4) CH₄

What are X and Y respectively in the following reaction? **3.**

Z-product $\stackrel{Y}{\longleftarrow}$ **2-butyne** $\stackrel{X}{\longrightarrow}$ **E-product**

1) Na/NH₃ (liq) and Pd/BaSO₄ + H₂ 2) Ni /
$$140^{\circ}$$
C and Pd/BaSO₄ + H₂

2) Ni /
$$140^{\circ}$$
C and Pd/BaSO₄ + H₂

4) Pd / BaSO₄ +
$$H_2$$
 and Na/NH₃ (liq)

In the following reaction, $C_2H_2 \xrightarrow{H_2O_4/H_2SO_4} X \square CH_3CHO$, what is 'X'? 4.

2)
$$CH_3 - O - CH_3$$

What is the product formed when acetylene reacts with hypochlorous acid? **5.**

 $CH_3 - CH_2 - C \equiv CH \xrightarrow{HgSO_4} A$ the compound 'A' is **6.**

1)
$$CH_3 - CH_2 - C - CH_3$$

4)
$$CH_3 - \overset{o}{C} - CH_3$$

Which of the following organic compounds exhibit acidic character?

1)
$$H_3C - C \equiv CH$$

2)
$$H_3C - C \equiv C - CH_3$$

3)
$$H_2C = CH_2$$

4)
$$H_3C-CH_3$$

8.	Identify the alkyne in the following se	equence of reactions
	Alkyne $\xrightarrow{H_2}$ (A) $\xrightarrow{Ozonolysis}$ $(B)_{ozonolysis}$	$\underset{only}{\longleftarrow} H_2C = CH_2$
	$1) H_3C - C \equiv C - CH_3$	$2) \ H_3C - CH_2 - C \equiv CH$
	$3) H_2 C = CH - C \equiv CH$	4) $HC \equiv C - CH_2 - C \equiv CH$
9.	The reagent (s) for the following conve	ersion
	$Br \xrightarrow{?} H = H$ Is / are	
	1) Alcoholic KOH	2) Alcoholic KOH followed by NaNH ₂
	3) Aqueous KOH followed by NaNH ₂	4) Zn / CH ₃ OH
10.	In the reactions (B) $\leftarrow \frac{Lindlars\ catalyst}{H_2} R - C$	$C \equiv C - R \xrightarrow{Na/NH_3} (A)$
	(A) and (B) are geometrical isomers. The	en
	1) 'A' is cis and 'B' is trans	2) 'A'n is trans and 'B' is cis
	3) 'A' and 'B' is cis	4) 'A' and 'B' are trans
11.	$CaC_2 + H_2O \rightarrow (X) \xrightarrow{O_3/H_2O} HCOOH$, (2)	X) is
	1) C_2H_2 2) C_2H_4	3) C ₂ H ₆ 4) Ca (OH) ₂
12.	The number of possible alkynes with a	molecular formula C ₅ H ₈ is
	1) 6 2) 5	3) 4 4) 3
13.	The decreasing order of acidic charac	cter among ethene (I), ethane (II), ethyne
	(III) and propyne (IV) is	
	1) $I > II > III > IV$ 2) $II > III > IV$	3) III > IV > II > I 4) IV > III > I
14.	A hydrocarbon of molecular formul	a, C ₆ H ₁₀ reacts with sodamide and the
	same on ozonolysis followed by h	ydrogen peroxide oxidation gives two
	molecules of carboxylic acids, or	ne being optically active. Then the
	hydrocarbon may be	
	1) 1-hexyne 2) 2- hexyne	3) 3- hexyne 4) 3-methyl-1-pentyne
15.	Acetylene contains same degrees of un	nsaturation as

16.	Propyne and prop	pene can be dis	stinguis	hed by			
	1) Conc. H ₂ SO ₄	2) Br_2 in CC	14	3) AgNO ₃ i	n ammonia	4) dil.K	MnO_4
17.	Two organic con	mpounds X a	nd Y	on analysis	give the	same perc	entage
	composition, nam	nely $\mathbf{C} = \left(\frac{12}{13}\right) \times$	100% a	$\mathbf{nd} \ \mathbf{H} = \left(\frac{1}{3}\right)$	×100% . Ho v	wever, com	pound
	'X' decolorizes bi	romine water	while co	ompound '	X' does not.	Two comp	ounds
	'X' and 'Y' may be respectively						
	1) Ethylene and be	enzene		2) Acetylen	e and benzer	ne	
	3) Toluene and ber	nzene		4) Benzene	and styrene		
18.	Addition of HOC	l to ethyne giv	es				
	1) Ethyl chloride			2) Vinyl ch	loride		
	3) Dichloro acetalo	dehyde		4) Ethylide	ne chloride		
19.	The end product	of the followin	g seque	nce of oper	ation is		
	$CaC_2 \xrightarrow{H_2O} A \xrightarrow{H}$	$_{2SO_{4}} \rightarrow B \xrightarrow{LiAlH_{4}} B$	$\rightarrow C$				
	1) Methyl alcohol	2) Ethyl alco	hol	3) Acetalde	hyde 4) I	Ethylene	
20.	The name of the p	poisonous gas l	formed	by the inte	raction of ac	etylene and	d
	arsenic trichlorid	e is					
	1) Lewisite	2) Phosgene		3) Westron	4) I	Mustard gas	
21.	A metallic carbid	e on treatmen	t with v	vater gives	a colourless	gas which	burns
	readily in air and	l gives a preci	pitate v	vith ammo	niacal silver	nitrate sol	lution.
	The gas evolved is	S					
	1) CH ₄	$2) C_2 I$	\mathbf{I}_6	3) C	$_{2}H_{4}$	$4) C_2H_2$	
	N						
			KEY				
	1) 2 2) 4 3) 1	4) 4 5) 3	6) 1	7) 1 8) 1	9) 2 10)	2 11) 1 1	2) 4

13) 3 14) 4 15) 2 16) 3 17) 2 18) 2 19) 2 20) 1 21) 4

4. SUB TOPIC NAME: BENZENE

1.	Which one of the	e following statemen	ts is wrong?			
	1) Aromatic compounds are richer in carbon content					
	2) Aromatic com	pounds burn with sm	oky flame			
	3) Aromatic com	pounds are generally	unstable			
	4) Aromatic com	pounds show substitu	ition reactions			
2.	The C-C-C bond	l angle in benzene is				
	1) 90°	2) 60°	3) 109°	4) 120°		
3.	The decreasing of	order of reactivity t	owards electrophili	c substitution reaction		
	of the following o	compounds benzene	, chlorobenzene, nit	robenzene, toluene is		
		1 2	3	4		
	1) 1 > 3 > 4 > 2	2) $4 > 1 > 3 > 2$	3) $4 > 1 > 2 > 3$	4) $4 > 2 > 1 > 3$		
4.	The nitro group	in nitrobenzene is				
	1) Ortho – directi	ng	2) Meta – directin	g		
	3) Para- directing	.0	4) Ortho – and par	ra – directing		
5.	The function of a	anhydrous aluminiu	m chloride in the F	riedel – Crafts reaction		
	is	119				
	1) To absorb wate		2) To absorb hydro	ochloric acid		
	3) To produce an	electrophile	4) To produce nuc	eleophile		
6.	Chlorination of l	benzene in the prese	nce of halogen carri	er is an example of:		
	1) Aromatic nucle	eophilic substitution				
	2) Aromatic electr	rophilic substitution				
	3) Aromatic nucle	eophilic addition				
	4) Aromatic electr	rophilic addition				
7.	In the nitration	of benzene with a m	nixture of conc.HNC	O ₃ and conc.H ₂ SO ₄ , the		
	active species inv	olved in				
	1) <i>NO</i> ₃	2) <i>NO</i> ₂	3) NO_2^-	4) NO_2^+		

8. In the sulphonation of benzene, the electrophile involved is: 4) SO_4^{2-} 1) HSO_{Λ}^{-} 2) SO_2 3) SO₂ 9. The reaction of chlorine with toluene in presence of ferric chloride gives predominantly 1) Benzoyl chloride 2) m-chlorotoluene 3) Benzyl chloride 4) o-and p-chlorotoluene **10.** Given are cyclohexanol (I), acetic acid (II), 2, 4, 6-trinitrophenol (III) and phenol (IV). In these the order of decreasing acidic character will be 1) III > II > IV > I 2) II > III > I > IV 3) II > III > IV > I 4) III > IV > II > I11. Which of the following acids is strongest? 1) $C_6H_5SO_3H$ 2) CH₃COOH 3) C₆H₅COOH 4) (COOH)₂ The substituent which is predominantly ortho para directing but deactivating **12.** in aromatic electrophilic substitution: 3) –OCH₃ 1) -NO₂2) –OH 4) - C113. Out of the given two compounds, the vapour pressure of (B) at a particular temperature is OH NO_2 NO_2 (B) 1) Same as that (A) 2) Lower than that of (A) 3) Higher than that of (A) 4) Higher or lower than (A) depending on the size of the vessel **14.** Chlorination of toluene in presence of light and heat followed by treatment

3) 2: 4 dihydroxy toluene

4) Benzoic acid

with aqueous NaOH gives

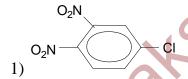
1) O-cresol 2) p-cresol

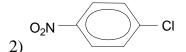
- 15. Which of the following is most reactive towards electrophilic substitution reaction?
 - 1) Aniline
- 2) Nitrobenzene
- 3) Benzoic acid
- 4) Acetanilide
- 16. Which of the following statements are correct with respect to the effect of trifluoromethyl group (-CF₃) on an electrophilic aromatic substitution?
 - a) The CF₃ group will deactivate the ring
 - b) The CF₃ group will activate the ring
 - c) The CF₃ group will be an O- and P-director
 - d) The CF₃ group will be a meta-director
 - 1) a and b
- 2) a and d
- 3) a and c
- 4) b and c
- 17. According to Huckel rules an aromatic compound must process:
 - 1) $(4n+1)\pi$ Electrons

2) $(4n+2)\pi$ electrons

3) $(2n+2)\pi$ Electrons

- 4) (2) and (3)
- 18. Which chloro derivative of benzene among the following would undergo hydrolysis most readily with aqueous NaOH to furnish the corresponding hydroxy compounds?







- 4) CI
- 19. According to Huckel rule the number of Pi electrons in naphthalene is
 - 1) 6
- 2) 10
- 3) 14
- 4) 16

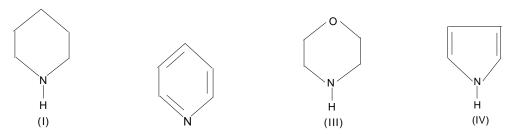
- 20. Most stable carbocation ion is
 - 1) $p NO_2 C_6H_4 \overset{+}{C}H_2$
- 2) $C_6H_5\overset{+}{C}H_2$

3) $p - Cl - C_6H_4 - CH_2$

4) $p - CH_3O - C_6H_4 - CH_2$

21.	The most suitable method of separation of a equal (1: 1) mixture of o- and
	p – nitro phenols is
	1) Sublimation 2) Crystallization 3) Chromatography 4) Distillation
22.	The reagent (s) which can be used to distinguish acetophenone from
•	benzophenone is (are):
	1) 2, 4 – dinitrophenyl hydrazine 2) Benedicts reagent
	3) I ₂ and Na ₂ CO ₃ 4) Aqueous solution of NaHSO ₃
23.	Among the following four compounds
	I) Phenol II) Methyl phenol III) m-Nitro phenol IV) p-Nitro phenol
	The acidity order is
	1) $IV > III > I > II$ 2) $III > IV > I > II$ 3) $I > IV > III > II$ 4) $II > III > IV$
24.	When nitrobenzene is treated with Br ₂ in presence of FeBr ₃ , the major product
	formed is m-bromo-nitrobenzene, statement which is related to obtain the
	m-isomer is
	1) The electron density on meta carbon is more than that of ortho and para positions
	2) Loss of aromaticity when Brt attacks at the Ortho and Para positions and not at
	meta positions.
	3) Easier loss of H ⁺ to region aromaticity from the meta position than from ortho
	and para positions.
	4) None of the above
25.	In the following groups
	-OAc, -OMe, -OSO ₂ Me, -SO ₂ CF ₃
	$(I) \qquad (II) \qquad (IV)$
	The order of leaving group ability is
	1) $I > II > III > IV$ 2) $IV > III > I > II$ 3) $III > II > IV$ 4) $II > III > IV > I$

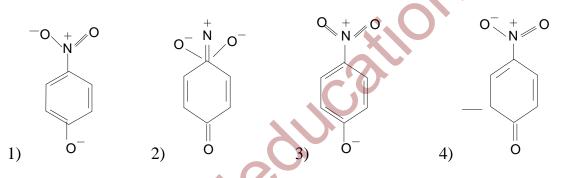
26. In the following compounds



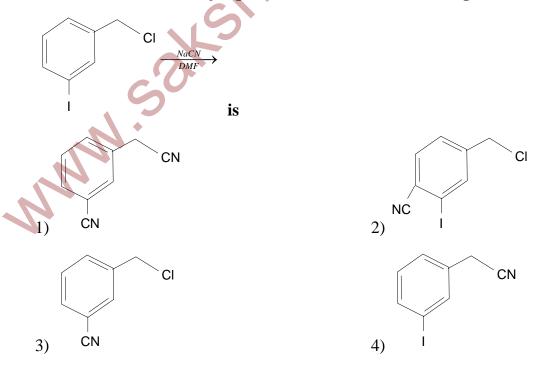
The order of basicity is

1)
$$IV > I > III > II$$
 2) $III > I > IV > II$ 3) $II > I > III > IV$ 4) $I > III > IV$

27. The most unlikely representation of resonance structures of p-nitrophenoxide ion is



28. The structure of the major product formed in the following reaction



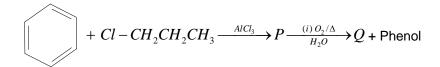
29. The strongest ortho para and strongest meta-directing groups respectively are

1) $-NO_2$ and $-NH_2$

2) $-NH_2$ and $-CoNH_2$

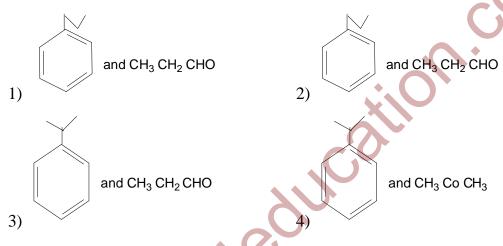
3) $-CoNH_2$ and $-NH_2$

4) $-NH_2$ and $-NO_2$



30.

The major products P and Q are

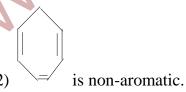


31. Presence of a nitro group in a benzene ring

- 1) Deactivates the ring towards electrophilic substitution
- 2) Activates the ring towards electrophilic substitution
- 3) Renders the ring basic
- 4) Deactivates the ring towards nucleophilic substitution

32. Pickout the wrong statement.

1) Toluene shows resonance.



- 3) The hybrid state of carbon in carbonyl group is sp².
- 4) Dipole moment of vinyl chloride is less than that of methyl chloride.

- 33. Toluene is nitrated and the resulting product is reduced with tin and hydrochloric acid. The product so obtained is diazotized and then heated with cuprous bromide. The reaction mixture so formed contains a
 - 1) Mixture of o-and m-bromo toluene's 2) mixture of o-and p-bromo toluene's
 - 3) Mixture of o-and p-dibromo benzenes 4) mixture of o-and p-bromo anilines
- 34. Fluorobezene (C_6H_5F) can be synthesized in the laboratory
 - 1) By heating phenol with HF and KF
 - 2) From aniline by diazotization followed by heating the diazonium salt with HBF₄
 - 3) By direct fluorination of benzene with F₂ gas
 - 4) By reacting bromobenzene with NaF solution
- 35. Phenyl magnesium bromide reacts with methanol to give
 - 1) A mixture of anisole and Mg(OH)Br 2) A mixture of benzene and Mg(OMe)Br
 - 3) A mixture of toluene and Mg(OH)Br 4) A mixture of phenol and Mg(Me)Br

KEY

- 1) 3 2) 4 3) 3 4) 2 5) 3 6) 2 7) 4 8) 2 9) 4 10) 1
- 11) 1 12) 4 13) 3 14) 4 15) 1 16) 2 17) 2 18) 1 19) 2 20) 2
- 21) 4 22) 3 23) 1 24) 1 25) 2 26) 4 27) 3 28) 4 29) 4 30) 4