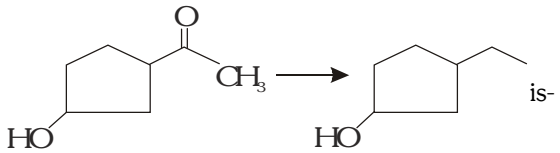
SELECT THE CORRECT ALTERNATIVE (ONLY ONE CORRECT ANSWER)

1. The smallest alkane which can show optical isomerism possesses -

(A) 5 carbons (B) 6 carbons (C) 7 carbons (D) 8 carbons

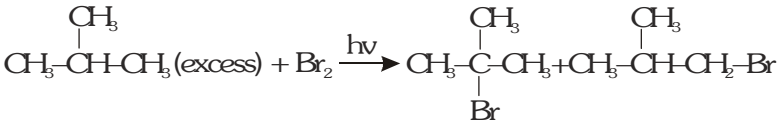
2. The appropriate reagent for the transformation



is-

(A) Zn(Hg)/HCl (B) NH_2NH_2,OH^- (C) H_2/Ni (D) $NaBH_4$

3. The relative reactivity of 1°H, 2°H and 3°H in bromination reaction has been found to be 1 : 82 : 1600 respectively. In the reaction -



(A) (B)

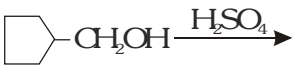
the percentage yields of the products (A) and (B) are expected to be -

(A) 99.4%, 0.6% (B) 50%, 50% (C) 0.6%, 99.4% (D) 80%,20%

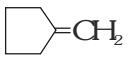
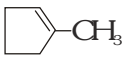
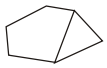
4. The least reactive alkane towards free-radical substitution reactions is-

(A) CH_4 (B) $(CH_3)_3CH$ (C) CH_3CH_3 (D) $CH_3CH_2CH_3$

5. For the reaction



the major product is :

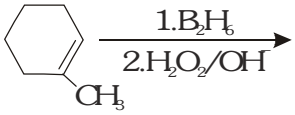
(A)  (B)  (C)  (D) 

6. Propene is allowed to react with B_2D_6 and the product is treated with acetic acid. The final product obtained is -

(A) 1–deuteriopropane (B) 2–deuteriopropane

(C) 1–deuteriopropene (D) 2–deuteriopropene

7. 1–Methylcyclohexene is allowed to react with B_2H_6. The product is then treated with H_2O_2 and NaOH. The reaction is -



The product formed is

(A) 1–methylcyclohexanol (B) 2–methylcyclohexanol

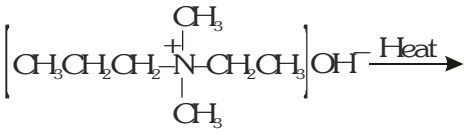
(C) methylcyclohexane (D) cyclohexanol

8. Propene on reaction with ICl produces mainly -

(A) 1–chloro–2–iodopropene (B) 2–chloro–1–iodopropane

(C) (±)–2–chloro–1–iodopropane (D) (±)–1–chloro–2–iodopropane

9. Consider the reaction



Which of the following is formed in major amount

(A) $CH_2=CH_2$ (B) $CH_3CH=CH_2$

(C) Both (A) and (B) in equal amount (D) None, as no reaction takes place

10. In the addition of HBr to propene in the absence of a peroxide, the first step involves the addition of -

(A) H^+ (B) Br^- (C) $H^\cdot$ (D) $Br^\cdot$

11. In the reaction

$CH_3CH_2CH=CH_2$; 

the product obtained is -

(A) $CH_3CH_2CHOHCH_2D$ (B) $CH_3CH_2CHDCH_2OH$

(C) $CH_3CH_2CD(OH)CH_3$ (D) $CH_3CH_2CD_2CH_2OH$

12. The major product obtained in the reaction of 1,3-Butadiene with HCl (1 mole) at a higher temperature (100ºC or above) is

(A) 3,4–dichloro–1–butene (B) 3–chloro–1–butene

(C) 1–chloro–2–butene (D) 2–chloro–2–butene

13. An optically active hydrocarbon (X) on catalytic hydrogenation gives an optically inactive compound (Y), C_6H_{14}. The hydrocarbon (X) is-

(A) 3–methyl–1–pentene (B) 3–methyl–2–pentene

(C) 2–ethyl–1–butene (D) 3–methylcyclopentene

14. The addition of HCl to 1–phenylpropene gives-

(A) $C_6H_5CHClCH_2CH_3$ (B) $C_6H_5CH_2CHClCH_3$

(C) $C_6H_5CH_2CH_2CH_2Cl$ (D) $C_6H_5CH(CH_3)CH_2Cl$

15. The reduction of 4–octyne with H_2 in the presence of $Pd/CaCO_3$ – quinoline gives-

(A) trans–4–octene (B) cis–4–octene

(C) a mixture of cis–and trans–4–octene (D) a completely reduced product C_8H_{18}

16. The ease of formation of free radicals follows the order -

(A) $3^o \Psi 2^o \Psi 1^o \Psi \overset{\cdot}{C}H_3$ (B) $\overset{\cdot}{C}H_3\ \Psi 1^o \Psi 2^o \Psi 3^o$

(C) $1^o \Psi 2^o \Psi 3^o \Psi \overset{\cdot}{C}H_3$ (D) $2^o \Psi 1^o \Psi 3^o \Psi \overset{\cdot}{C}H_3$

17. Which of the following has the lowest heat of hydrogenation per mole -

(A) cis–2–Butene (B) trans–2–Butene (C) 1–Butene (D) 1,3–Butadiene

18. The intermediate formed during the addition of HCl to propene in the presence of peroxide is-

(A) $CH_3\overset{\cdot}{C}HCH_2Cl$ (B) $CH_3CH_2\overset{\cdot}{C}H_2$ (C) $CH_3\overset{\Gamma}{C}HCH_3$ (D) $CH_3CH_2\overset{\Gamma}{C}H_2$

19. The order of stability of the alkenes

$R_2C=CR_2$, $R_2C=CHR$, $R_2C=CH_2$, $RCH=CHR$, and $RCH=CH_2$

I II III IV V

is -

(A) I > II > III > IV > V (B) I = II > III > IV > V

(C) II > I > IV > III > V (D) V > IV > III > I > II

20. Which of the following will not react with an ammonical silver nitrate solution :

(A) $CH_3C\rfloor CH$ (B) $(CH_3)_2CH–C\rfloor H$ (C) $CH_3C\rfloor CCH_3$ (D) $HC\rfloor CH$

CHECK YOUR GRASP	ANSWER KEY	EXERCISE -1

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans.	C	B	A	A	C	B	B	B	A	A	A	C	A	A	B	A	D	C	A	C

SELECT THE CORRECT ALTERNATIVES (ONE OR MORE THEN ONE CORRECT ANSWERS)

1. Which of the following reactions will result in the formation of a chiral centre in the product -

(A) $CH_3CH=CHCH_3+HBr$ (B) $CH_3CH=CH_2+HOBr$

(C) $CH_3CH_2CH=CH_2+HBr$ (D) $CH_3CH_2CH=CH_2+HBr$

2. Propene on reaction with N–bromosuccinimide in CCl_4 produces -

(A) 1, 2–dibromopropane (B) 3–bromopropene

(C) 1–bromopropene (D) 2–bromopropene

3. cis–2–Butene on reaction with Br_2 in CCl_4 produces mainly -

(A) 1–bromo–2–butene (B) 2,3–dibromobutane

(C) meso–2,3–dibromobutane (D) (±) 2,3–dibromobutane

4. The bond dissociation energies of the following

$CH_3–H$ $CH_3CH_2–H$ $CH_2=CH–CH_2–H$ $C_6H_5–H$

I II III IV

vary in the order :

(A) I > II > III > IV (B) IV > III > II > I (C) IV > I > II > III (D) II > I > IV > III

5. Which of the following decolourises alkaline $KMnO_4$ solution

(A) C_3H_8 (B) C_2H_4 (C) CH_4 (D) CCl_4

6. Compounds capable of reacting with ammonical $AgNO_3$ solution are

(A) $CH_3-\underset{\displaystyle CH_3}{\underset{|}{CH}}-C\equiv CH$ (B) $HC\equiv CH$ (C) 1- Butyne (D) all the above

7. A hydrocarbon which decolourises $KMnO_4$ but does not give any precipitate with ammoniated $AgNO_3$

(A) Benzene (B) Acetylene (C) Butyne (D) 2–Butene

8. Compound 'A' on chlorination gives compound 'B', compound 'B' reacts with alc. KOH gives gas 'C', which decolourise Baeyer reagent. ozonolysis of compound 'C' gives only HCHO compound. 'A' is :

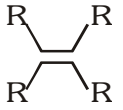
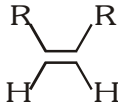
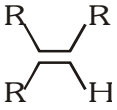
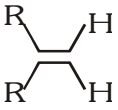
(A) C_2H_6 (B) C_2H_4 (C) C_4H_{10} (D) C_2H_5Cl

9. Which reagent converts propene to 1–propanol

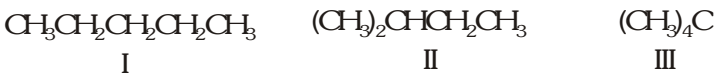
(A) H_2O, H_2SO_4 (B) B_2H_6, H_2O_2, OH^-

(C) $Hg(OAc)_2$,$NaBH_4/H_2O$ (D) Aq. KOH

10. Which one of the following alkenes will react faster with H_2 under catalytic hydrogenation conditions : [R = Alkyl Substituent]

(A)  (B)  (C)  (D) 

11. Arrange the following in order of increase/decrease in boiling point.



I II III

(A) I > II > III (B) II > I > III (C) III > I > II (D) III < II < I

12. What are the products obtained upon the ozonolysis of 2-pentene ?

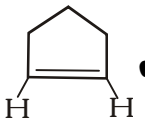
(A) CH_3CH_2CHO (B) CH_3CHO (C) CH_3COCH_3 (D) $CH_3COCH_2CH_3$

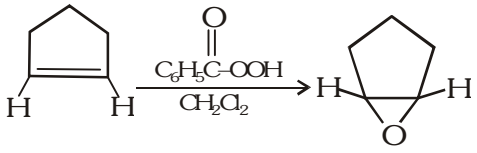
13. Which of the following can be used for the preparation of propane ?

(A) $CH_3CH{=}CH_2 \xrightarrow[2.CH_3COOH]{1.B_2H_6}$ (B) $CH_3CH_2CH_2Cl \xrightarrow[2.H_2O]{1.Mg/ether}$

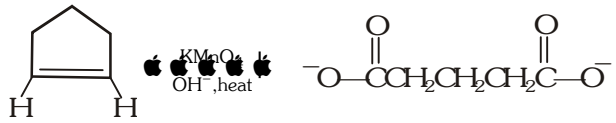
(C) $CH_3CH_2CH_2I \xrightarrow{Red\,P/HI,150^\circ C}$ (D) $CH_3CH_2CH_2COONa \xrightarrow[\Delta]{NaOH/CaO}$

14. Which of the following are correct :

(A)  $\xrightarrow[2.Zn,H_2O]{1.O_3}$ $OHC{-}CH_2CH_2CH_2{-}CHO$

(B) 

(C) 

(D) 

15. 2-Bromo-3-phenylpropane can be synthesised by

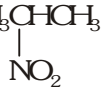
(A) $C_6H_5CH_2CH(OH)CH_3+PBr_3$

(B) $C_6H_5CH{=}CHCH_3$+HBr+ benzoyl peroxide

(C) $C_6H_5CH_2CH_2CH_3+Br_2$+ light

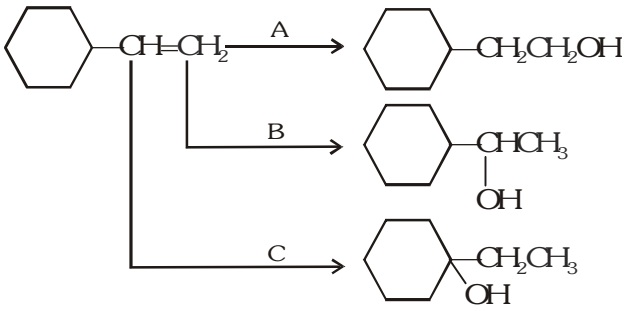
(D) none of these

16. The nitration of propane with concentrated HNO_3 gives :

(A) $CH_3CH_2CH_2NO_2$ (B)  (C) $CH_3CH_2NO_2$ (D) CH_3NO_2

17. Which of the follwing will react with sodium metal :

(A) Ethyne (B) 1-Butyne (C) 2-Butyne (D) Ethane

18. 

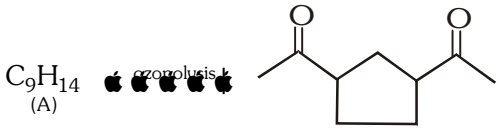
A, B and C are :

(A) simple hydration

(B) hydroboronation, mercuration-demercuration, hydration

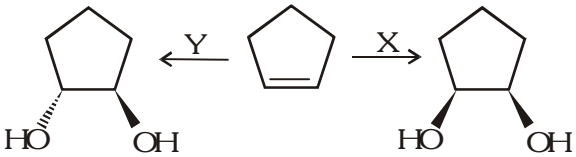
(C) hydration, hydroboronation, mercuration-demercuration

(D) mercuration-demercuration, hydration, hydroboronation

19. 

Hence A is :

(A)  (B)  (C)  (D) 

20. 

Select X and Y out of :

I : MnO_4^Z/OH^- II : HCO_3H

(A) X -I, Y- II (B) X -II, Y- I (C) X -I, Y- I (D) X -II, Y- II

BRAIN TEASERS				ANSWER KEY							EXERCISE -2				
Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	A, B,D	B	D	C	B	D	D	A	B	B	A, D	A, B	A,BC,D	A,BC,D	A,B
Que.	16	17	18	19	20										
Ans.	A,BC,D	A, B	B	B	A										

TRUE OR FALSE :

1. Although acetylene acidic in nature it does not react with NaOH/KOH.
2. Although C—H bond in acetylene has greatest bond energy of all C—H bond, yet it is most acidic.
3. $CH_2=\ddot{C}H$ is less basic than $HC\rfloor|\ddot{C}$
4. —C ⌋ C— has two ⇔bond yet it is less reactive than  towards electrophilic addition reaction.
5. Partial reduction of alkynes is either syn or anti.

FILL IN THE BLANKS :

1. Out of cis-2 butene and trans-2-butene, ... has the lower melting point.
2. A four-carbon alkyne having weakly acidic character is .....
3. Alkanes undergo ..... reactions whereas alkynes give ..... reaction.
4. ..... is a versatile method for locating the position of the double bond in an alkene.
5. The valence atomic orbital on carbon in silver acetylide is ..... hybridized.

MATCH THE COLUMN

1. Match the column I with column II.

	Column-I		Column-II
(A)	Wurtz reaction	(p)	Electrophilic substitution reaction
(B)	Hydration of alkenes	(q)	Free radical substitution
(C)	Nitration of alkane	(r)	Electrophilic addition reaction
(D)	Reaction of alkene with NBS	(s)	Nucleophilic substitution

2. Match the column I with column II.

Column-I		Column-II	
$CH_3—CH=CH_2$	(A) $CH_3—CH_2—CH_2Br$	(p)	HBr
	(B) $CH_3—CHBr—CH_3$	(q)	HBr + peroxide
	(C) $CH_3—CHBr—CH_2Br$	(r)	NBS
	(D) $BrCH_2—CH=CH_2$	(s)	Br_2, low temp., dark

3. Match the column I with column II.

	Column-I		Column-II
(A)	Dehydrohalogenation of alkyl halides	(p)	Kolbe reaction
(B)	Electrolysis of sodium salt	(q)	Alc. KOH
(C)	Ozonolysis	(r)	Addition product of ethylene
(D)	Dichloro ethylene	(s)	Sodalime
(E)	Decarboxylation	(t)	Alkene