Exercise-1

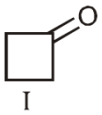
OBJECTIVE QUESTIONS

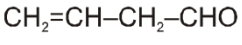
Section (A) : Degree of Unsaturation and hydrogenation

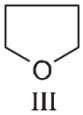
A-1. The DU of following compound $C_8H_{12}O$, C_3H_5N, C_4H_8O are respectively :

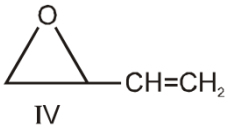
(1) 4,3,2 (2) 3,2,1 (3) 2,1,3 (4) 2,2,3

A-2. Which of the following compounds have same degree of unsaturation ?


I

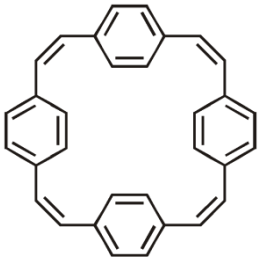

II

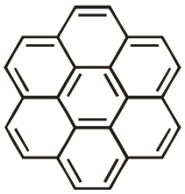

III


IV

(1) I, II (2) I and III (3) I, II and III (4) I, II and IV

A-3.

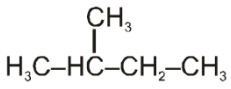

(A)


(B)

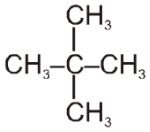
D.U. of (A) and (B) is respectively :

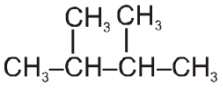
(1) 21 & 19 (2) 20 & 18 (3) 20 & 19 (4) 21 & 20

A-4. Which of the following alkanes cannot be synthesised by hydrogenation of any alkene or alkyne ?

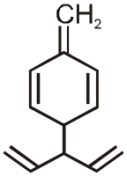
(1) 

(2) $CH_3–CH_2–CH_2–CH_2–CH_3$

(3) 

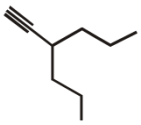
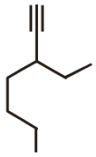
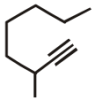
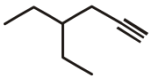
(4) 

A-5. Number of moles of hydrogen required for complete hydrogenation of one mole of the following compound is :



(1) 6 (2) 7 (3) 5 (4) 3

A-6. Which alkyne will give 3-ethyl heptane on catalytic hydrogenation ?

(1)  (2)  (3)  (4) 

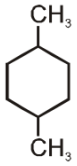
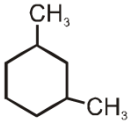
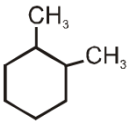
A-7. Which of the following hydrocarbons give same product on hydrogenation ?
(1) 2-Methylhex-1-ene & 3-Methylhex-3-ene
(2) 3-Ethylhex-1-en-4-yne & 2-Methylhept-2-en-4-yne
(3) 3-Ethylcycloprop-1-ene & 1,2-Dimethylcycloprop-1-ene
(4) 2-Methylbut-2-ene & 3-Methylbut-1-ene

Section (B) : Monochloroination & Ozonolysis

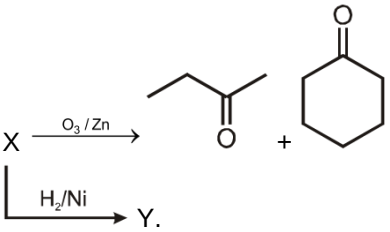
B-1 Only two isomeric monochloro derivatives are possible for :-
(1) n-Pentane (2) 2,4-Dimethyl pentane
(3) Toluene (4) 2,3-Dimethyl butane

B-2 The number of possible monochloro derivatives of 2, 2, 3, 3-Tetramethylbutane is -
(1) 2 (2) 3 (3) 4 (4) 1

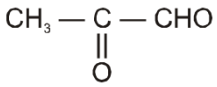
B-3. Which of the following alkene gives four monochloro (structural isomer) products after hydrogenation ?
(1) Pent-2-ene (2) 2-Methylbut-2-ene (3) 3-Methylhex-2-ene (4) 2, 3-Dimethylbut-2-ene

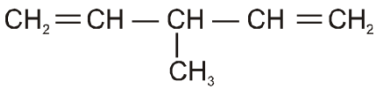
B-4. Which of the following compound will give four monochloro (structural) product on monochlorination ?
(1)  (2)  (3)  (4) 

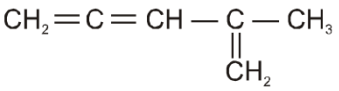
B-5. An organic compound C_4H_6 on ozonolysis gives formaldehyde and glyoxal. What is the structure of organic compound ?
(1)  (2)  (3)  (4) $CH_3–CH_2–C\equiv CH$

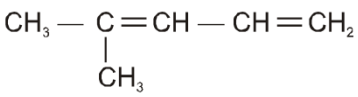
B-6. X 

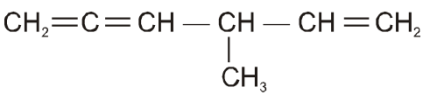
The IUPAC name of compound Y is :
(1) 2-Cyclohexyl butane (2) 1-Methyl propyl cyclohexane
(3) Butyl cyclohexane (4) 1-Cyclohexyl butane

B-7. An alkene give two moles of HCHO, one mole of CO_2 and one mole of  on ozonolysis. What is its structure?

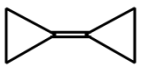
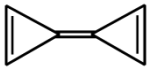
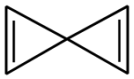
(1) 

(2) 

(3) 

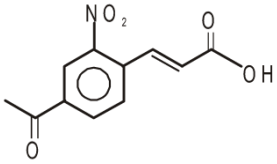
(4) 

B-8. A hydrocarbon C_6H_4 gives $C_3H_2O_3$ on reductive ozonolysis. The hydrocarbon is :

(1)  (2)  (3)  (4) 

Section (C) : Test for acidic Hydrogen & Unsaturation

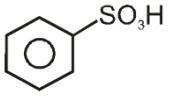
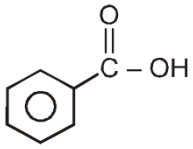
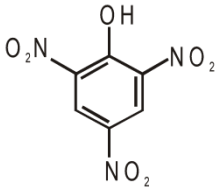
C-1. When one mole of the given compound reacts with sodium metal then how many moles of H_2 gas will release?

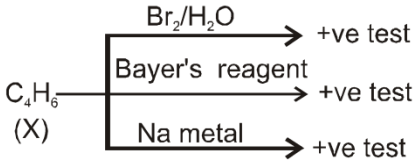


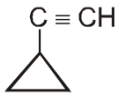
(1mole)

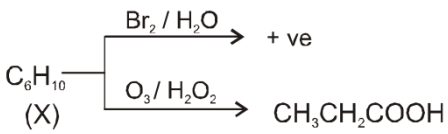
(1) 1 mole (2) 1.5 mole (3) 2 mole (4) 0.5 mole

C-2. Which of the following would produce effervescence with sodium bicarbonate?

(1)  (2)  (3)  (4) All of these

C-3.  ; Compound X is

(1) $H_3C–C\equiv C–CH_3$ (2) $CH_2=CH–CH=CH_2$ (3) $CH_3–CH_2–C\equiv CH$ (4) 

C-4. 

Identify X :

(1) $CH_3–CH_2–C\equiv C–CH_2–CH_3$ (2) $CH_3–C\equiv C–CH_2–CH_2–CH_3$

(3)  (4) 

C-5. Ammonical $AgNO_3$ give white ppt. after reaction with any compound then this reflects the presence of

(1) One – CHO group (2) One triple bond

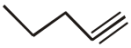
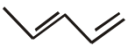
(3) A terminal alkyne (4) Compound is unsaturated

C-6. Which of the following compound gives red ppt with Cu_2Cl_2 / NH_4OH ?

(1) $CH_3–C\equiv C–CH_3$ (2) $CH_3–CH_2–C\equiv CH$

(3) $CH_3–CH_2–CH=CH_2$ (4) $CH_3–C\equiv C–CH=CH_2$

C-7. Identify the hydrocarbon having molecular formula C_5H_6 which gives white ppt with ammonical $AgNO_3$?

(1)  (2)  (3)  (4) 

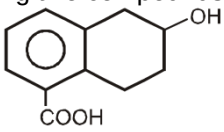
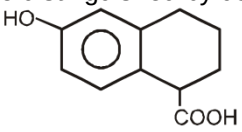
Section (D) : Test for Functional groups

D-1. The group reagent for the test of alcohol is :

(1) Cerric ammonium nitrate (2) Schiff's reagent

(3) Molisch's reagent (4) Bromine water

D-2. The following two compounds I and II can be distinguished by using reagent

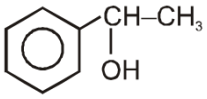
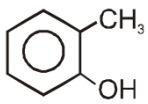
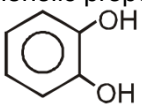
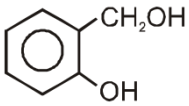
(I)  (II) 

(a) aq. $NaHCO_3$ (b) Neutral $FeCl_3$

(c) Blue litmus solution (d) Na metal (e) $HCl/ZnCl_2$ anhydrous

(1) a or c (2) b or e (3) d or e (4) c or d

D-3. Which of the following compounds does not show phenolic properties :

(1)  (2)  (3)  (4) 

D-4. The compound responds to Tollen's reagent is :

(1) CH_3COCH_3 (2) CH_3CHO (3) CH_3CONH_2 (4) CH_3COOH

D-5. Benzoic acid can be distinguished from ethyl benzoate by

(1) $NaHCO_3$ (2) Fehling solution (3) Carbylamine test (4) Action with dil. HCl

D-6. Benzaldehyde and acetone can be distinguished by

(1) Mulliken Barker test (2) Fehling solution (3) Iodoform test (4) Ninhydrin test

D-7. Phenol and Benzoic acid can be distinguished by

(1) $FeCl_3$ test (2) Mollisch test (3) Hinsberg test (4) Tollen's test

D-8. Acetaldehyde and benzaldehyde can be distinguished by

(1) Tollen's test (2) Fehling solution (3) $FeCl_3$ test (4) $NaHCO_3$ test

D-9. Propanal and propanone can not be distinguished by

(1) Iodoform test (2) Fehling solution (3) Tollen's test (4) 2,4- DNP test

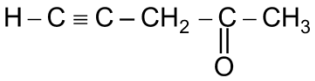
D-10. Formic acid and acetic acid can be distinguished by

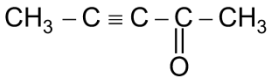
(1) Iodoform test (2) NaOH solution (3) Tollen's test (4) $NaHCO_3$ test

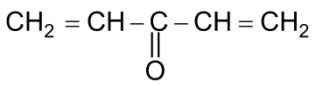
D-11. Which of the following test given by both But-1-yne and Butanal ?

(1) Fehling test (2) Lucas test (3) Tollen's test (4) 2,4-DNP test

D-12. Which of the following compound will give black or silver ppt. with Tollen's reagent.

(1) 

(2) 



(3) $CH_3–C\equiv C–CH_2–CHO$ (4)

D-13. Which of the following will give CO_2 gas with $NaHCO_3$?

(1) Picric acid (2) p-hydroxy benzoic acid

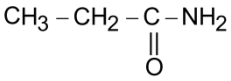
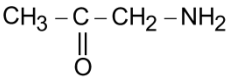
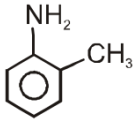
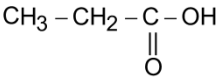
(3) Benzene sulphonic acid (4) All of these

D-14. 2-Pentanone can be distinguished from 3- Pentanone by which reagent ?

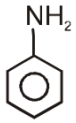
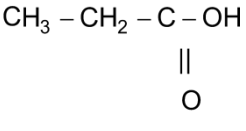
(1) 2, 4- Dinitrophenyl hydrazine (2) Tollen's reagent

(3) I_2 and dilute NaOH (4) Fehling solution

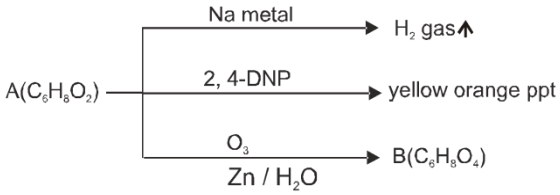
D-15. Which of the following compound will give smell of NH_3 with conc. NaOH.

(1)  (2)  (3)  (4) 

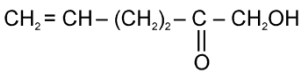
D-16. Which of the following will not give positive test with $CHCl_3$ / KOH.

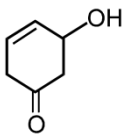
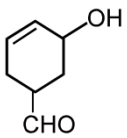
(1) $CH_3–CH_2–NH–CH_3$ (2) $CH_3–CH_2–CH_2–NH_2$ (3)  (4) 

D-17. The compound A gives following reactions.



Its structure can be

(1)  (2) $OHC–(CH_2)_2–CH=CH–COOH$

(3)  (4) 

D-18. $C_2H_5NH_2$ and $PhNH_2$ can be distiguished by ?

(1) Carbyl amine test (2) Hinsberg test

(3) Hofmann mustard oil test (4) All of these

D-19. Which of the following amine does not react with Hinsberg's reagent ?

(1) $CH_3CH_2NH_2$ (2) $(CH_3CH_2)_2NH$ (3) $(CH_3CH_2)_3N$ (4) All of these

Section (E) : Elements detection

E-1. In the Lassaigne's test, one of the organic compounds give red colour with $FeCl_3$. Compound can be :
(1) Na_2S (2) NH_2CSNH_2 (3) C_6H_5Cl (4) NaCN

E-2. Lassaigne's test is used in qualitative analysis to detect
(1) Nitrogen (2) Sulphur (3) Chlorine (4) All of these

E-3. The compound that does not give a blue colour in Lassaigne's test is
(1) $C_6H_5–NH_2$ (2) CH_3CONH_2 (3) $NH_2–NH_2$ (4) $C_6H_5–NO_2$

E-4. Nitrogen containing organic compound when fused with sodium metal forms:
(1) $NaNO_2$ (2) NaCN (3) $NaNH_2$ (4) NaNC

E-5. The sodium extract of an organic compound on acidification with acetic acid and addition of lead acetate solution gives a black precipitate. The organic compound contains
(1) Nitrogen (2) Halogen (3) Sulphur (4) Phosphorus

E-6. The prussian blue colour obtained during the test of nitrogen by Lassaigne's test is due to the formation of :
(1) $Fe_4[Fe(CN)_6]_3$ (2) $Na_3[Fe(CN)_6]$ (3) $Fe(CN)_3$ (4) $Na_4(Fe(CN)_5NOS]$

E-7. In Lassaigne's test, the organic compound is fused with sodium metal as to :
(1) hydrolyse the compound
(2) form a sodium derivative
(3) convert nitrogen, sulphur or halogens if present into soluble ionic sodium compound
(4) burn the compound

E-8. In Lassaigne's solution, pink/violet colour is produced when sodium nitroprusside solution is added. It indicates the presence of :
(1) sulphur (2) nitrogen (3) chlorine (4) none of these

E-9. The sodium extract of an organic compound on boiling with HNO_3 and addition of ammonium molybdate solution gives a yellow precipitate. The compound contains :
(1) nitrogen (2) P (3) S (4) Cl

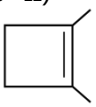
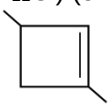
Exercise-2

PART - I : OBJECTIVE QUESTIONS

1. How many alkenes on catalytic hydrogenation give isopentane as a product (consider only structural isomers)?
(1) 2 (2) 3 (3) 4 (4) 5

2. Identify E in the following sequence of reaction.

$$E\ (C_6H_{10}) \xrightarrow{H_2\ /\ Ni} F\ (C_6H_{12}) \xrightarrow{Cl_2\ /\ h\upsilon} G\ (C_6H_{11}Cl)\ \text{(only one isomer)}$$

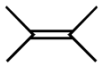
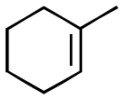
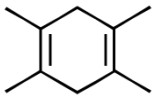
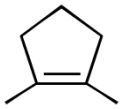
(1)  (2)  (3)  (4) 

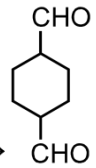
3. An unknown compound on ozonolysis to give acid $C_3H_6O_2$ and a ketone C_4H_8O. From this information, identify structure of unknown compound.

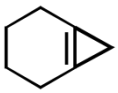
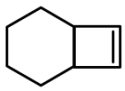
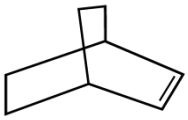
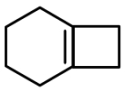
(1) $(CH_3)_2C=CHCH_2–CH_2CH_3$ (2) $CH_3CH_2-\underset{\displaystyle CH_3}{\overset{\displaystyle CH_3}{\overset{|}{\underset{|}{C}}}}=CHCH_2CH_3$

(3) $(CH_3)_2CHCH=CHCH_2CH_3$ (4) $CH_3CH_2CH_2CH=CHCH_2CH_3$

4. Identify the structure of compound which consume only one mole H_2 gas during hydrogenation and give only 2-monochloro structural products after hydrogenation. It yield only ketone after reductive ozonolysis.

(1)  (2)  (3)  (4) 

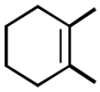
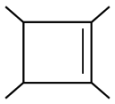
5. An alkene (A) $\xrightarrow{\text{Ozonolysis}}$  , A is :

(1)  (2)  (3)  (4) 

6. The chemical reactions of an unsaturated compound 'M' are given below. Determine the possible structural formula of 'M'

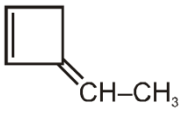
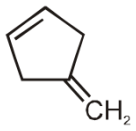
(M) C_8H_{14} —$\xrightarrow{O_3}$ $C_8H_{14}O_2$(N)

C_8H_{14} —$\xrightarrow{H_2/Ni}$ C_8H_{16}(O) $\xrightarrow{Cl_2/\,h\upsilon}$ $C_8H_{15}Cl$(P) (only one monochloro product)

(1)  (2)  (3)  (4) 

7. X $\xrightarrow{O_3/Zn,\ H_2O}$ $H-\overset{O}{\overset{\|}{C}}-CH_2-\overset{O}{\overset{\|}{C}}-CH_2-\overset{O}{\overset{\|}{C}}-H$ + HCHO

The structure of X will be :

(1)  (2)  (3)  (4) 

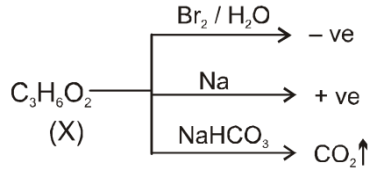
8. Red precipitate $\xleftarrow[NH_4OH]{Cu_2Cl_2}$ $P(C_5H_8)$ $\xrightarrow{\text{Ozonolysis}}$ 2-Methylpropanoic acid + compound (Q)

structure of P can be -

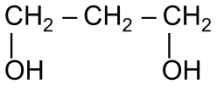
(1) $CH_3–CH_2–CH_2–C\equiv CH$ (2) $CH_3–\underset{\displaystyle CH_3}{\overset{\displaystyle CH_3}{\overset{|}{\underset{|}{C}}}}H–C\equiv CH$

(3) $CH_3C\equiv C–CH_2–CH_3$ (4) $CH_3-\underset{\displaystyle CH_3}{\overset{\displaystyle CH_3}{\overset{|}{\underset{|}{C}}}}H-CH=CH_2$

9.



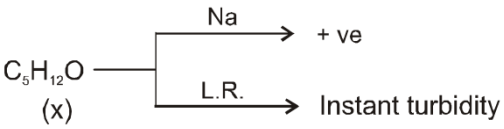
Identify 'X'.

(1) $CH_3–CH_2–COOH$ (2)  (3) $CH_3–CO–CH_2–OH$ (4) $CH_2=CH–CH_2–OH$

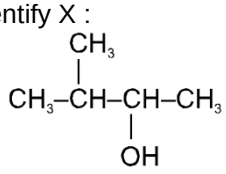
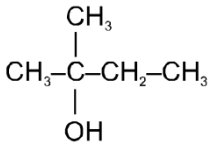
10. Which of the following will give CO_2 gas with $NaHCO_3$?

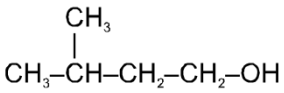
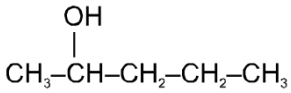
(1) Methanol (2) Benzoic acid (3) Phenol (4) Hexanol

11.

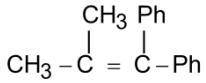


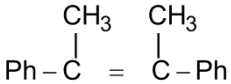
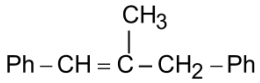
Identify X :

(1)  (2) 

(3)  (4) 

12. Compound 'A' ($C_{16}H_{16}$) on ozonolysis gives only one product 'B', (C_8H_8O). 'B' gives positive Iodoform test and forms sodium benzoate as one of the product. Identify the structure of 'A.

(1) $Ph–CH_2–CH=CH–CH_2–Ph$ (2) 

(3)  (4) 

13. Which gas is released when Acetamide reacts with NaOH ?

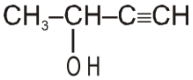
(1) CO_2 (2) N_2 (3) NH_3 (4) $COCl_2$

14. Aromatic primary amines can be distinguished from aliphatic primary amines by

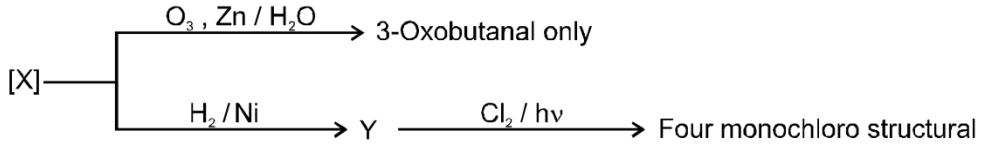
(1) Tollen's test (2) Action on red litmus paper

(3) Azo dye test (4) Action with dil. HCl

15. An organic compound does not react appreciably with Lucas reagent but give white precipitate with Tollen's reagent. Which is the possible structure of compound ?

(1)  (2) $CH_3–C\equiv C–CH_2–CH_2–OH$

(3) $HC\equiv C–CH_2–CH_2–OH$ (4) 



16.

Compound 'X' is :

(1) 1-Methylcyclopropene (2) 1, 4-Dimethylcyclohexa-1,4-diene

(3) 1, 4-Dimethylcyclohexa-1,3-diene (4) 1, 2-Dimethylcyclohexa-1,4-diene

17. When a primary amine is warmed with carbon disulphide in the presence of mercuric chloride, the product is

(1) Carbylamine (2) Alkyl isothiocyanate

(3) Mercaptan (4) Alkyl cyanide

18. An aromatic amine (X) was treated with alcoholic potash and another compound (Y) then foul smelling gas C_6H_5NC is formed. The compound (Y) was formed by reacting compound (Z) with Cl_2 in the presence of slaked lime. The compound (Z) is :

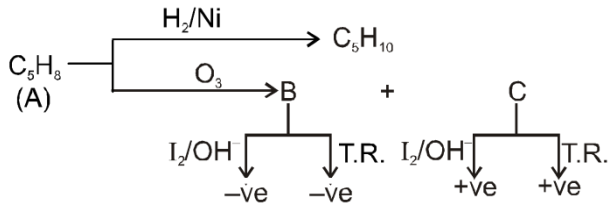
(1) $CHCl_3$ (2) CH_3COCH_3 (3) CH_3OH (4) $C_6H_5NH_2$

19. A positive carbylamine test is given by :

(1) N,N–Dimethylaniline (2) 2, 4-Dimethylaniline

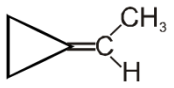
(3) N-Methyl-o-methylaniline (4) N-Methylaniline

20.



Identify the structure of A :

(1) $CH_3–CH_2–C\equiv C–CH_3$ (2) $CH_3CH_2CH=CHCH_3$ (3) $CH_3–CH=C(CH_3)_2$ (4)



PART - II : MISCELLANEOUS QUESTIONS

Section (A) : ASSERTION/REASONING

DIRECTIONS :

Each question has 4 choices (1), (2), (3) and (4) out of which ONLY ONE is correct.

(1) Both assertion and reason are correct, and the reason is the correct explanation for the assertion

(2) Both assertion and reason are correct, but the reason is not the correct explanation for the assertion

(3) The assertion is incorrect, but the reason is correct

(4) Both are assertion and reason are incorrect

A-1. **Assertion :** Secondary & tertiary alcohols can not be distinguished by lucas reagent.
Reason : Lucas reagent gives turbidity with both tertiary and secondary alcohol.

A-2. **Assertion :** All C–C π bonds of alkene & alkyne (C=C, C≡C) are hydrogentated by using catalysts Ni/Pt/Pd at room temperature.The reaction can't be stopped at any intermediate stage.
Reason : Aromatic π bonds are stable at room temperature but can be hydrogenated at high temperature.

A-3. **Assertion :** All positional isomers of any one alkene or alkyne (due to different position of multiple bond) always give same product on hydrogenation.
Reason : Before and after hydrogenation of unsaturated compounds, carbon skelton remain unchanged.

A-4. **Assertion :** Hexamethyl benzene on chlorination give only one mono chloroproduct.
Reason : In hexamethyl benzene all hydrogen atoms are same.

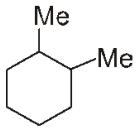
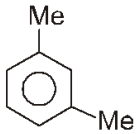
A-5. **Assertion :** One mole of 1, 4-dimethyl benzene (p-xylene) gives two moles of oxalic acid and one mole of 2-oxopropanoic acid on reductive ozonolysis.
Reason : Benzene ring on reductive ozonolysis generally gives acids and ketones.

Section (B) : MATCH THE COLUMN

B-1.

Column-I (Pair of compounds)	**Column-II (Reagent used to distinguish them)**
(A) Benzaldehyde and benzoic acid	(p) Conc. HCl, anhydrous $ZnCl_2$
(B) Pentan-2-ol & 2-methylbutan-2-ol	(q) $NaHCO_3$
(C) Ethanol and Phenol	(r) $CHCl_3$ + KOH
(D) Aniline and N-methyl aniline	(s) Neutral $FeCl_3$

B-2. **Match the column**

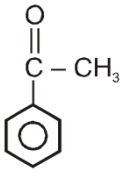
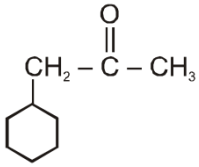
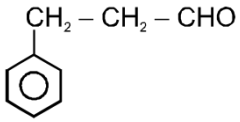
Column (I) (Compound)	Column (II) (No. of monochloro structural product)
(A)  $\xrightarrow{Cl_2/h\nu}$	(p) = 1
(B)  $\xrightarrow{Cl_2/h\nu}$	(q) = 2
(C)  $\xrightarrow{Cl_2/h\nu}$	(r) = 3
(D)  $\xrightarrow{Cl_2/h\nu}$	(s) = 4

Section (C) : ONE OR MORE THAN ONE OPTIONS CORRECT

C-1. Which one of the following will not give white precipitate with ammonical silver nitrate solution

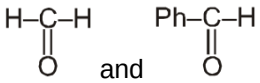
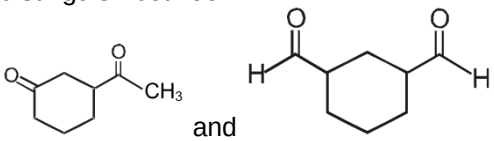
(1) $CH_3–C\equiv C–CH_3$ (2) $CH_3 - \underset{\displaystyle CH_3}{\underset{|}{CH}} - C \equiv C - CH_3$ (3) $CH_3–CH_2–CH=CH_2$ (4) $CH_3–CH_2–C\equiv CH$

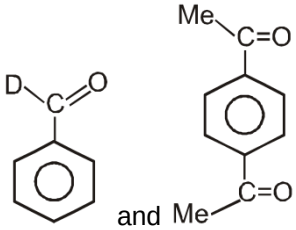
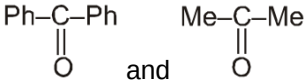
C-2. Which of the following compound will react with I_2 /OH^-.

(1)  (2)  (3)  (4) CH_3–CHO

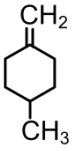
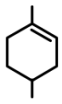
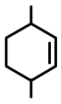
C-3. Molisch reagent is used to identify following compound ?
(1) Glucose (2) Maltose (3) Benzoic acid (4) Benzaldehyde

C-4. Tollen's reagent ($AgNO_3 + NH_4OH$) can be used to distinguish between.

(1)  and (2)  and

(3)  and (4)  and

C-5. Which of the following compound is/are react with Na metal & liberate hydrogen gas.
(1) CH_3–OH (2) CH_3–C≡CH (3) Ph–OH (4) 

C-6. Which of the following compound gives 1,4-Dimethyl cyclohexane when undergo catalytic hydrogenation.
(1)  (2)  (3)  (4) 

C-7. Which of the following will perform iodoform reaction with I_2/OH^-?
(1) $CH_3COCH_2CH_3$ (2) CH_3CONH_2 (3) $C_6H_5COCH_3$ (4) CH_3CHO

C-8. Formic acid and Acetaldehyde can be distinguish by
(1) I_2 + NaOH (2) Tollen's reagent (3) Fehling solution (4) 2,4-DNP test

Exercise-3

PART - I : JEE (MAIN) / AIEEE PROBLEMS (PREVIOUS YEARS)

1. On mixing a certain alkane with chlorine and irradiating it with ultraviolet light, it forms only one monochloroalkane this alkane could be : **[AIEEE 2003, 2/225]**
(1) propane (2) pentane (3) isopentane (4) neopentane.

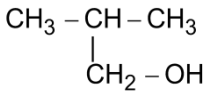
2. The prussian blue colour obtained during the test of nitrogen by Lassaigne's test is due to the formation of : **[AIEEE 2004, 2/225]**
(1) $Fe_4[Fe(CN)_6]_3$ (2) $Na_3[Fe(CN)_6]$ (3) $Fe(CN)_3$ (4) $Na_4(Fe(CN)_5NOS]$

3. Of the five isomeric hexanes,the isomer which can give two monochlorinated compounds is ? **[AIEEE 2005, 3/225]**
(1) n–Hexane (2) 2,3-Dimethylbutane (3) 2,2-Dimethylbutane (4) 2-Methylpentane

4. Among the following the one that gives positive iodoform test upon reaction with I_2 and NaOH is ?

[AIEEE 2006, 3/165]

(1) $CH_3CH_2CH(OH)CH_2CH_3$ (2) $C_6H_5CH_2CH_2OH$

(3)  (4) $PhCHOHCH_3$

5. In the following sequence of reactions, the alkene affords the compound 'B'

$CH_3CH = CHCH_3 \xrightarrow{O_3} A \xrightarrow[Zn]{H_2O} B$ compound B is **[AIEEE 2008, 3/105]**

(1) CH_3CH_3CHO (2) CH_3COCH_3 (3) $CH_3CH_2COCH_3$ (4) CH_3CHO

6. Which of the following reagents may be used to distinguish between phenol and benzoic acid ? **[AIEEE 2011, 4/120]**

(1) Aqueous NaOH (2) Tollen's reagent (3) Molisch reagent (4) Neutral $FeCl_3$

7.* Silver Mirror test is given by which one of the following compounds? **[AIEEE 2011, 4/120]**

(1) Acetaldehyde (2) Acetone (3) Formaldehyde (4) Benzophenone

8. Ozonolysis of an organic compound 'A' produces acetone and propionaldehyde in equimolar mixture. Identify 'A' from the following compounds : **[AIEEE 2011, 4/120]**

(1) 1-Pentene (2) 2-Pentene (3) 2-Methyl-2-pentene (4) 2-Methyl-1-pentene

9. Which of the following compounds can be detected by Molisch's test : **[AIEEE 2012, 4/120]**

(1) Nitro compounds (2) Sugars (3) Amines (4) Primary alcohols

10. Which branched chain isomer of the hydrocarbon with molecular mass 72u gives only one isomer of mono substituted alkyl halide ? **[AIEEE 2012, 4/120]**

(1) Tertiary butyl chloride (2) Neopentane (3) Isohexane (4) Neohexane

11. Iodoform can be prepared from all except : **[AIEEE 2012, 4/120]**

(1) Ethyl methyl ketone (2) Isopropyl alcohol

(3) 3–Methyl–2–butanone (4) Isobutyl alcohol

12. On heating an aliphatic primary amine with chloroform and ethanolic potassium hydroxide, the organic compound formed is : **[JEE(Main)-2014, 4/120]**

(1) an alkanol (2) an alkanediol (3) an alkyl cyanide (4) an alkyl isocyanide

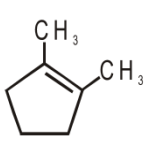
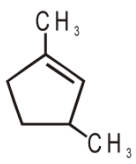
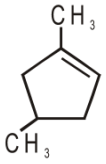
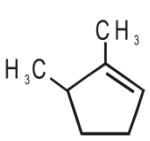
13. For the estimation of nitrogen, 1.4 g of an organic compound was digested by Kjeldahl method and the evolved ammonia was absorbed in 60 mL of $\frac{M}{10}$ sulphuric acid. The unreacted acid required 20 mL of $\frac{M}{10}$ sodium hydroxide for complete neutralization. The percentage of nitrogen in the compound is : **[JEE(Main)-2014, 4/120]**

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

14. In Carius method of estimation of halogens, 250 mg of an organic compound gave 141 mg of AgBr. The percentage of bromine in the compound is : (at. mass Ag = 108 ; Br = 80) **[JEE(Main)-2015, 4/120]**

(1) 24 (2) 36 (3) 48 (4) 60

15. Which compound would give 5-keto-2-methyl hexanal upon ozonolysis ? **[JEE(Main)-2015, 4/120]**

(1)  (2)  (3)  (4) 

PART - II : JEE (ADVANCED) / IIT-JEE PROBLEMS (PREVIOUS YEARS)

*** Marked Questions may have more than one correct option.**

1. Five isomeric para-disubstituted aromatic compounds A to E with molecular formula $C_8H_8O_2$ were given for identification. Based on the following observations, give structures of the compounds.
(i) Both A and B form a silver mirror with Tollen's reagent; also B gives a positive test with $FeCl_3$ solution. **[JEE 2002(M), 5/150]**
(ii) C gives positive iodoform test.
(iii) D is readily extracted in aqueous $NaHCO_3$ solution.
(iv) E on acid hydrolysis gives 1, 4-dihydroxybenzene.

2. Identify a reagent from the following list which can easily distinguish between 1-butyne and 2-butyne.
(A) bromine, CCl_4 (B) H_2, Lindlar catalyst **[IIT-JEE-2002(S), 3/150]**
(C) dilute H_2SO_4, $HgSO_4$ (D) ammonical Cu_2Cl_2 solution

3. In conversion of 2-butanone to propanoic acid which reagent is used. **[JEE 2005, 3/154]**
(A) NaOH, NaI / $H^{\oplus}$ (B) Fehling solution (C) NaOH, I_2 / $H^{\oplus}$ (D) Tollen's reagent

4. The compound that does **NOT** liberate CO_2, on treatment with aqueous sodium bicarbonate solution, is
(A) Benzoic acid (B) Benzenesulphonic acid **[JEE 2013, 2/120]**
(C) Salicylic acid (D) Carbolic acid (Phenol)

Answers

EXERCISE - 1

A-1.	(2)	**A-2.**	(4)	**A-3.**	(1)	**A-4.**	(3)	**A-5.**	(3)
A-6.	(2)	**A-7.**	(4)	**B-1**	(4)	**B-2**	(4)	**B-3.**	(2)
B-4.	(4)	**B-5.**	(3)	**B-6.**	(2)	**B-7.**	(2)	**B-8.**	(3)
C-1.	(4)	**C-2.**	(4)	**C-3.**	(3)	**C-4.**	(1)	**C-5.**	(3)
C-6.	(2)	**C-7.**	(1)	**D-1.**	(1)	**D-2.**	(2)	**D-3.**	(1)
D-4.	(2)	**D-5.**	(1)	**D-6.**	(3)	**D-7.**	(1)	**D-8.**	(2)
D-9.	(4)	**D-10.**	(3)	**D-11.**	(3)	**D-12.**	(3)	**D-13.**	(4)
D-14.	(3)	**D-15.**	(1)	**D-16.**	(1)	**D-17.**	(3)	**D-18.**	(4)
D-19.	(3)	**E-1.**	(2)	**E-2.**	(4)	**E-3.**	(3)	**E-4.**	(2)
E-5.	(3)	**E-6.**	(1)	**E-7.**	(3)	**E-8.**	(1)	**E-9.**	(2)

EXERCISE - 2

PART - I

1.	(2)	**2.**	(1)	**3.**	(2)	**4.**	(1)	**5.**	(3)
6.	(3)	**7.**	(2)	**8.**	(2)	**9.**	(1)	**10.**	(2)
11.	(2)	**12.**	(3)	**13.**	(3)	**14.**	(3)	**15.**	(3)
16.	(4)	**17.**	(2)	**18.**	(2)	**19.**	(2)	**20.**	(4)

PART - II

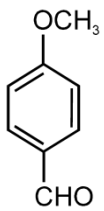
A-1.	(3)	**A-2.**	(2)	**A-3.**	(1)	**A-4.**	(1)	**A-5.**	(4)
B-1.	(A → q) ; (B → p) ; (C → s) ; (D → r)			**B-2.**	(A → q) ; (B → s) ; (C → p) ; (D → r)				
C-1.	(1,2,3)	**C-2.**	(1,2,4)	**C-3.**	(1,2)	**C-4.**	(2,3)	**C-5.**	(1,2,3)
C-6.	(1,2,3)	**C-7.**	(1,3,4)	**C-8.**	(1,4)				

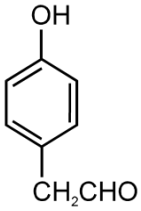
EXERCISE - 3

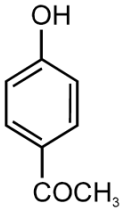
PART - I

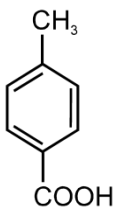
1.	(4)	**2.**	(1)	**3.**	(2)	**4.**	(4)	**5.**	(4)
6.	(4)	**7.**	(1)	**8.**	(3)	**9.**	(2)	**10.**	(2)
11.	(4)	**12.**	(4)	**13.**	(2)	**14.**	(1)	**15.**	(2)

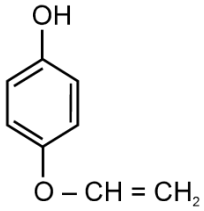
PART - II

1. (A) 

(B) 

(C) 

(D) 

(E) 

2. (D) **3.** (C) **4.** (D)