PART III: ORGANIC CHEMISTRY

XI

SECTION I: SINGLE OPTION CORRECT

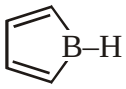
835. During the preparation of ethane by Kolbe's electrolytic method using inert electrodes, the pH of the electrolyte:

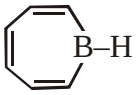
(A) increases progressively as the reaction proceeds
(B) decreases progressively as the reaction proceeds
(C) remains constant throughout the reaction
(D) may decrease , if the concentration of the electrolyte is not very high

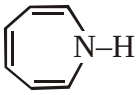
836. Arrange the following compounds in increasing order of their reactivity towards E_2 elimination with $(CH_3)_3COK$ in t-butanol:

(I) $PhCHClCH_3$ (II) $PhCH_2CH_2Cl$
(III) $CH_3COCH_2CH_2Cl$ (IV) $CH_3COCHClCH_3$
(A) I < II < III < IV (B) III < II < IV < I (C) III < IV < II < I (D) I < IV < II < III

837. Which of the following compound would exhibit aromatic properties:

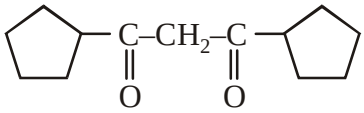
(A) 

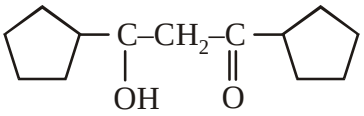
(B) 

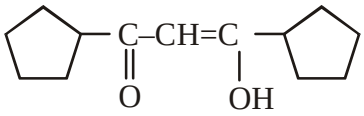
(C) 

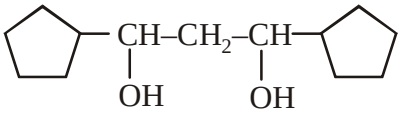
(D) 

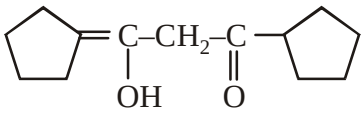
838. Which of the following is the enol tautomer of the compound shown?



(A) 

(B) 

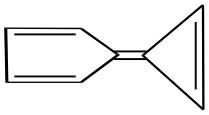
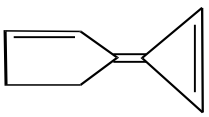
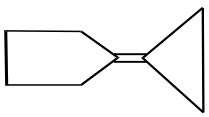
(C) 

(D) 

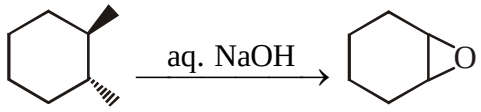
839. Highest heat of combustion is observed in:

(A) n-hexane (B) 2-methylpentane
(C) 3-methylpentane (D) 2,2,3-trimethylbutane

840. Which of the following has highest dipole moment ?

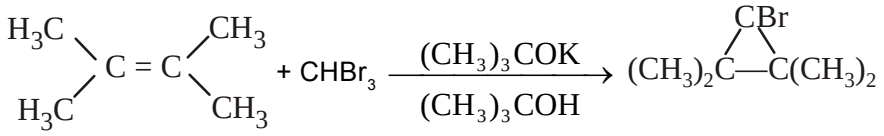
(A) H – F (B) 
(C)  (D) 

841. Which of the following reactions involves a carbene reaction intermediate?

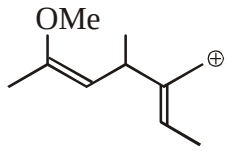
(A) 

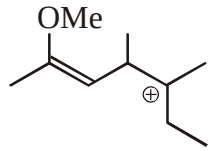
(B) $(CH_3)_3CBr \xrightarrow{EtOH} (CH_3)_3COC_2H_5$

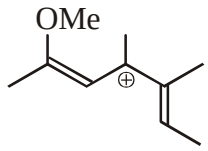
(C) $CH_4 + 4Cl_2 \xrightarrow{h\nu} CCl_4 + 4HCl$

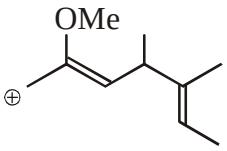
(D) 

842. Which of the following is the most stabilized carbocation?

(A) 

(B) 

(C) 

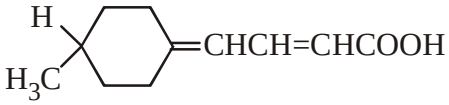
(D) 

843. Sodium formate on Kolbe's electrolysis, the products liberated at anode and cathode respectively are A and B.

(A) A = CO_2 B = H_2 (B) A = H_2 B = CO_2

(C) A = H_2 B = H_2 (D) A = CO_2 B = CO_2

844. How many stereoisomers are possible for the following molecule?



(A) 1 (B) 2 (C) 3 (D) 5

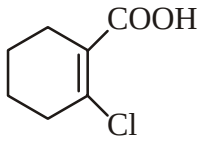
845. Kolbe's synthesis of 2, 2-dimethyl propanoic acid gives the following major product(s) at anode.

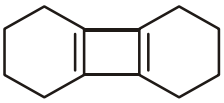
(A) isoctane (B) isobutene & isobutane

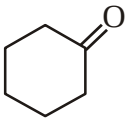
(C) 2, 2, 3, 3-tetramethyl butane (D) hydrogen gas

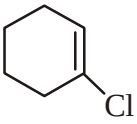
846. The relative reactivity of $1^o : 2^o : 3^o$ hydrogens to chlorination is 1 : 3.8 : 5. The percentage of 2 - chlorobutane, formed during the reaction of chlorine and butane.

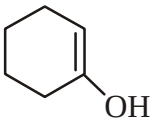
(A) 72 % (B) 28 % (C) 44 % (D) 33. 3 %

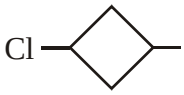
847.  $\xrightarrow[CaO]{NaOH}$ The product is

(A) 

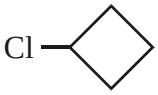
(B) 

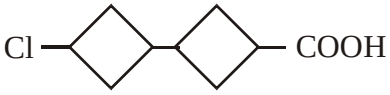
(C) 

(D) 

848.  $\xrightarrow[CaO]{NaOH}$ The major product is

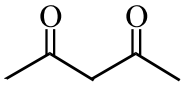
(A) 

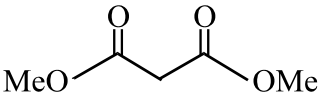
(B) 

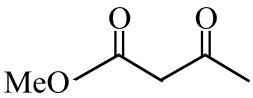
(C) 

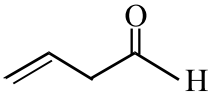
(D) 

849. Among the following compounds, the one that undergo deprotonation most radily in the presence of a base to form a carbanion is :

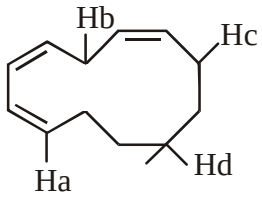
(A) 

(B) 

(C) 

(D) 

850. Increasing bond dissociation energy of the indicated C–H bond:



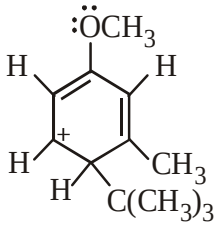
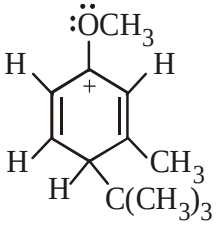
(A) c < b < a < d

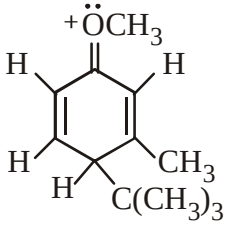
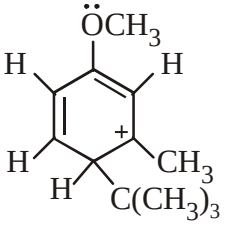
(B) b < a < d < c

(C) b < c < d < a

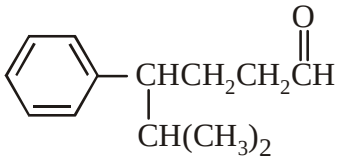
(D) d < c < b < a

581. Which is the most stable resonance form?

(A)  ⟷ (B)  ⟷

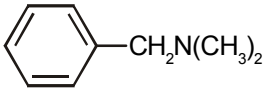
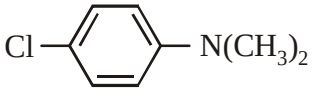
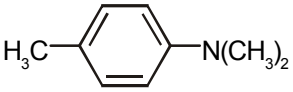
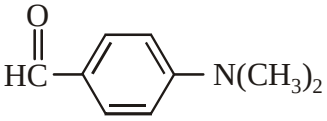
(C)  ⟷ (D) 

852. What is the IUPAC name for the compound shown?

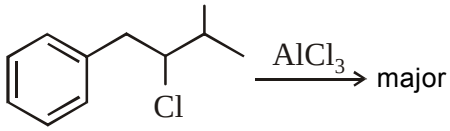


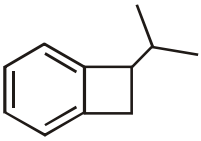
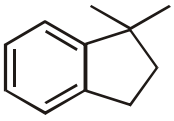
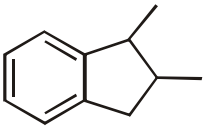
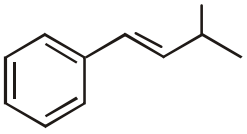
(A) 4-Benzyl-4-isopropylbutanal
(B) 4-Isopropyl-4-phenylbutanal
(C) 2-methyl-3-phenylhexanal
(D) 5-Methyl-4-phenylhexanal

853. Which one of the amines is the least basic?

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

854. Give the major product of the following reaction:



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

855. Which of the following are feasible reactions?

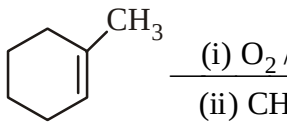
(i) $HC\equiv CH + CH_3Li \rightarrow HC\equiv CLi + CH_4$

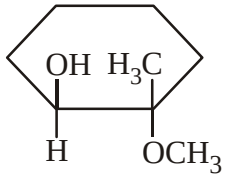
(ii) $HC\equiv CH + NaOH \rightarrow HC\equiv CNa + H_2O$

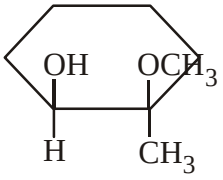
(iii) $HC\equiv CNa + NH_3 \rightarrow HC\equiv CH + NaNH_2$

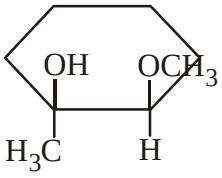
(iv) $H_2C{=}CH_2 + HC\equiv CNa \rightarrow H_2C{=}{=}CHNa + HC\equiv CH$

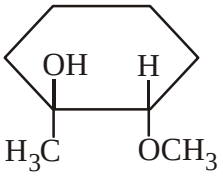
(A) i, ii and iii (B) ii, iii and iv (C) i, iii and iv (D) only i

856.  A. A is

(A) 

(B) 

(C) 

(D) 

857. Which of the following method will obtain major yield of coupling product?

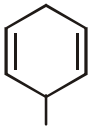
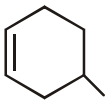
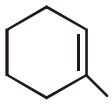
(A) $CH_3 - CH_2Mg\,Cl + CH_3 - \underset{\displaystyle H}{\overset{\displaystyle CH_3}{\underset{|}{\overset{|}{C}}}} - CH_2 - Cl \longrightarrow \overset{\displaystyle CH_3}{\overset{|}{CH_3 - CH}} - CH_2 - CH_2 - CH_3$

(B) $\overset{\displaystyle CH_3}{\overset{|}{CH_3 - CH}} - CH_2 - MgCl + CH_3 - CH_2 - Cl \longrightarrow \overset{\displaystyle CH_3}{\overset{|}{CH_3 - CH}} - CH_2 - CH_2 - CH_3$

(C) $(CH_3 - CH_2)_2\,CuLi + \overset{\displaystyle CH_3}{\overset{|}{CH_3 - CH}} - CH_2 - Cl \longrightarrow \overset{\displaystyle CH_3}{\overset{|}{CH_3 - CH}} - CH_2 - CH_2 - CH_3$

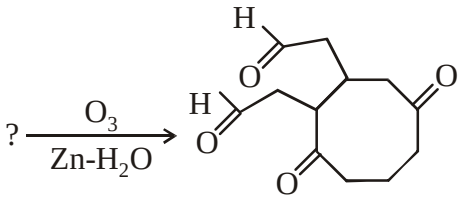
(D) $(\overset{\displaystyle CH_3}{\overset{|}{CH_3 - CH}} - CH_2)_2CuLi + CH_3 - CH_2 - Cl \longrightarrow \overset{\displaystyle CH_3}{\overset{|}{CH_3 - CH}} - CH_2 - CH_2 - CH_3$

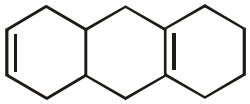
858. Arrange the following reaction in decreasing order of reactivity with NBS/heat:

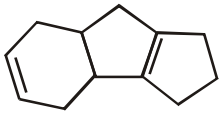
(1)  (2)  (3)  (4) 

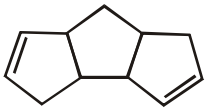
(A) 1 > 2 > 3 > 4 (B) 2 > 1 > 3 > 4 (C) 1 > 2 > 4 > 3 (D) 4 > 3 > 2 > 1

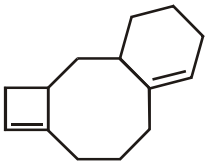
859. Which starting material should be used to produce the compound shown below?



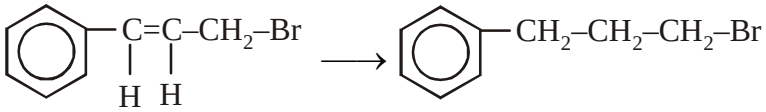
(A) 

(B) 

(C) 

(D) 

860. Which of the following reagents can be used for the following conversions



(A) $NH_2–NH_2/H_2O_2$ (B) $H_2/Pd–C$

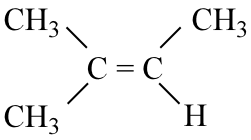
(C) $LiAlH_4$ (D) Zn-Cu/EtOD

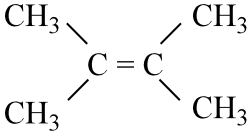
861. Reactivity of $F^{\ominus}$ is highest in–

(A) DMF (B) H_2O (C) EtOH (D) benzene

862. Which one of the following alkene will react fastest with H_2 under catalytic hydrogenation?

(A) Trans-cyclohexene (B) Cis-cyclohexene

(C) 

(D) 

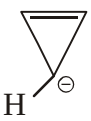
863. $Br–CH_2–C\equiv CH \xrightarrow{Mg / Et_2O}$ The product is

(A) $HC\equiv C–CH_2–Mg^+Br^-$ (B) $CH_3–C\equiv C–Mg^+Br^-$

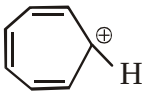
(C) $HC\equiv C–CH_2–O–Et$ (D) Both (a) and (b)

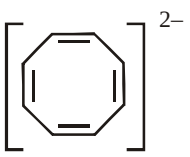
SECTION II: MORE THAN ONE OPTION CORRECT

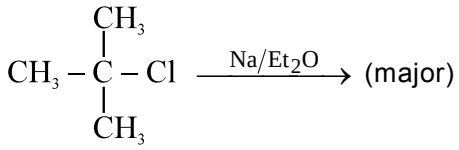
864. Which of the following are aromatic:

(A) 

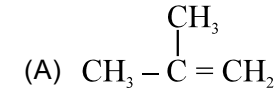
(B) 

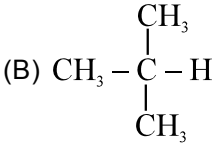
(C) 

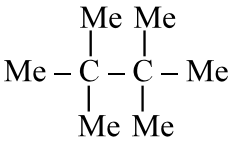
(D) 

865. 

(major)

(A) 

(B) 

(C) 

(D) none of these

SECTION III: COMPRHENSIONS

ALKANES

COMPREHENSION # 101

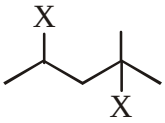
Paragraph for Questions Nos. 866 to 868

Alkanes can be prepared by Wurtz reaction, in which, alkyl halides are coupled each other with the help of metallic sodium is dry ether solvent, to give alkanes.

$$2RX \xrightarrow[dry\ ether]{Na} R-R$$

Due to elimination and rearrangement reactions, different byproducts are formed. Unsymmetrical alkanes can be prepared by this method, but practically it is very difficult to separate the individual alkane from the mixture of alkanes.

866. Which one of the following is correct for the following dihalide:



(A) intramolecular coupling alone take place

(B) extramolecular coupling alone take place

(C) intramolecular coupling dominates extramolecular coupling

(D) extramolecular coupling dominates intramolecular coupling

867. Identify the incorrect statement. In the stoichiometric Wurtz reaction on ethyl chloride.

(A) disproportionation of alkyl carbanion and alkyl halide take place.

(B) some sodium metal remains in the reaction mixture

(C) the byproducts dominate the chief product

(D) inter molecular hydrogenation take place

868. The intermediate in Wurtz reaction is:

(A) Carbanion (B) Carbocation

(C) anion radical (D) organo metallic compound

COMPREHENSION # 102
Paragraph for Questions Nos. 869 to 871

Wurtz reacton involves the condensation of two molecules of alkyl halides in the presence of sodium and dry ether $R-X+2Na+X-R \xrightarrow{DryEehter} R-R+2NaX$

In this reaction small amount of alkene is also formed as by-product.

$$CH_3CH_2Br+CH_3CH_2Br \xrightarrow{Na/Dry\ \text{ehter}} CH_3-CH_2-CH_2-CH_3+CH_2=CH_2+\underbrace{CH_3-CH_3}_{\text{By-products}}$$

Tertiary alkyl halides do not give Wurtz reaction. Frankland reaction is similar but has similar but has certain advantages over Wurtz reaction. It is useful in the synthesis of symmetrical alkanes. Frankland reaction is shown by primary, secondary as well as tertiary alkyl halide.

Answer the following questions

869. Which of the following alkanes is not obtained from Wurtz reaction?

(A) Methane (B) Ethane (C) Propane (D) Butane

870. A mixture of ethyl iodide and methyl iodide is subjected to the Wurtz reaction. The products formed are:

(A) ethane (B) butane (C) propane (D) 2-methylpropane

871. The intermediate compound(s) formed in frankland reaction is/are:

(A) $RZnI_2$ (B) R_2Zn (C) RZnI (D) R_2ZnI

COMPREHENSION # 103
Paragraph for Questions Nos. 872 to 874

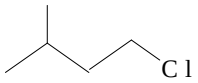
Chlorination on alkanes at below 300^0C

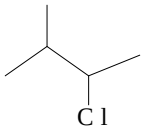
Reactivity order $3^0-H > 2^0-H > 1^0-H$

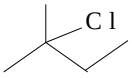
$4.5 : 3.25 : 1$

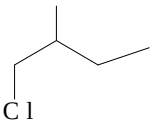
mono chlorination on 2-methyl butane

872. In the above reaction major product is

A) 

B) 

C) 

D) 

873. Number of isomers obtained in the above reaction

(A) 4 (B) 3 (C) 6 (D) 5

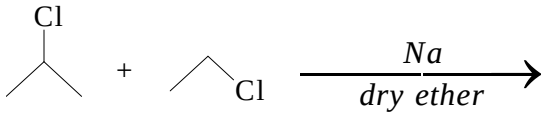
874. If chlorination takes place at '1' and '3' positions an 2-methyl butane simultaneously then how many optically active isomers are possible.

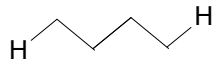
(A) 2 (B) 4 (C) 6 (D) 8

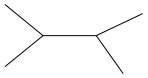
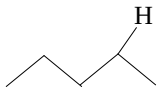
COMPREHENSION # 104
Paragraph for Questions Nos. 875 to 877

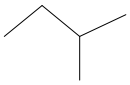
$$R - X \xrightarrow[dry\ ether]{Na} R - R + Na_X$$

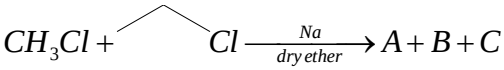
Mechanism is uncertain but explained by both ionic and free radical mechanism.

875. 

A) 

B) 
C) 

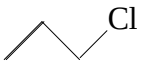
D) 

876. 

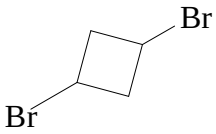
A, B, C are saturated hydrocarbons . Then *A, B, C* are

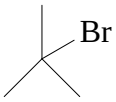
(A) Chain isomers (B) Positional isomers
(C) Homologous (D) Diastereomers

877. Which of the following reactant is not suitable for wurtz reaction

A) 

B) 

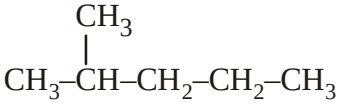
C) 

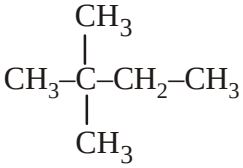
D) 

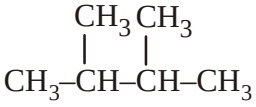
COMPREHENSION # 105
Paragraph for Questions Nos. 878 to 880

An alkane (A) molecular formula C_6H_{14} reacts with chlorine in the presence of ultra violet light to yield three isomeric monochloro derivatives (B) , (C) and (D) . Of these only (C) and (D) undergo dehydrohalogenation with sodium ethoxide in ethanol to produce an alkene . Moreover (C) and (D) yields the same alkene (E) (C_6H_{12}) . Hydrogenation of (E) produces (A) . Treating (E) with HCl produces a compound (F) that is an isomer of (B) , (C) and (D) . Treating (F) with Zn and acetic acid gives a compound (G) , which is isomeric with (A). Propose structures for (A) to (G) .

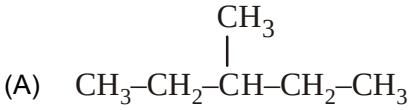
878. The structure of A is

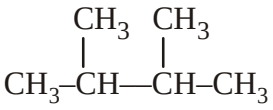
(A) $CH_3–CH_2–CH_2–CH_2–CH_2–CH_3$ (B) 

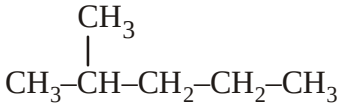
(C) 

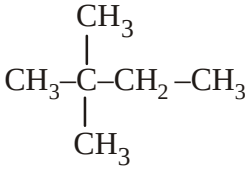
(D) 

879. The structure of G is

(A) 

(B) 

(C) 

(D) 

880. The compound (F) on treatment with alcoholic KOH, the major product obtained is

(A) 1-hexene (B) 2,3-dimethyl-2-butene

(C) 2,3-dimethyl-1-butene (D) 3-hexene

COMPREHENSION # 106

Paragraph for Questions Nos. 881 to 883

Alkanes are the saturated hydrocarbons. They are represented by a general formula C_nH_{2n+2} (n = 1, 2.....). They can be synthesized by different methods. One of the important method of formation is Corey-House synthesis. In this process when alkyl halide is treated with lithium, it forms alkyl lithium. Alkyl lithium on treatment with cuprous halide the formation of lithium dialkyl cuprate takes place. When it is treated with another alkyl halide or same alkyl halide, an alkane formation takes place. The reactions are as follows **:**

$$R{-}X + Li \longrightarrow RLi + LiX$$

$$2RLi + CuX \longrightarrow R_2CuLi + LiX$$

$$R_2CuLi + R'X \longrightarrow \underbrace{R{-}R'}_{\text{Alkane}} + RCu + LiX$$

And in case of Wurtz reaction when alkyl halide (RX) is treated with sodium in presence of dry ether it gives the formation of alkane.

$$2RX + Na \xrightarrow[\text{Ether}]{\text{Dry}} R{-}R + 2NaX.$$

881. In Corey house reaction the yield of R–R' by raction of R'–X with R_2CuLi is in the following order

(A) Primary > Secondary > Tertiary (B) Tertiary > Secondary > Primary

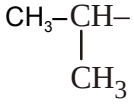
(C) Secondary > Primary > Tertiary (D) Secondary > Tertiary > Primary

882. In case of Wurtz reaction which alkyl halide gives maximum yield of alkane?

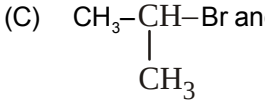
(A) Isopropyl bromide (B) Methyl bromide

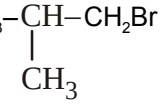
(C) Tert-butyl bromide (D) Ethyl bromide

883. To form the isopentane which of the following alkyl halides should be used in Corey house synthesis (RX) and (R'X) respectively as shown above **:**

(A) Both 

(B) CH_3Br and $CH_3CH_2CH_2CH_2Br$

(C) 

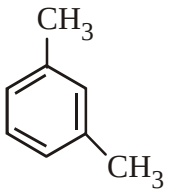
(D) CH_3Br and 

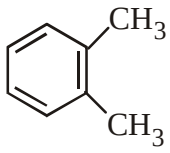
COMPREHENSION # 107

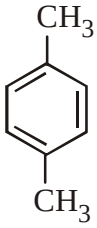
Paragraph for Questions Nos. 884 to 886

Two unknown compounds (A & B) have same molecular formula C_4H_9Br which give n-butane on reaction with Zn-Cu/EtOH

884. The compound A on wurtz reaction gives a linear hydrocarbon (X) which on further reaction with Cr_2O_3/Al_2O_3 gives an hydrocarbon that has octane number more than 100. The compound is:

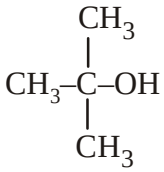
(A) 

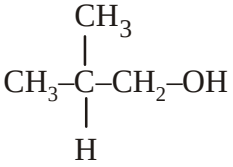
(B) 

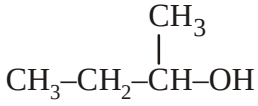
(C) 

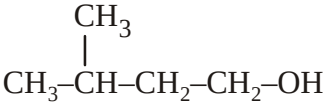
(D) 

885. The compound A $\xrightarrow{LiAlH_4}$ C $\xrightarrow{AlCl_3}$ D $\xrightarrow[H^+]{KMnO_4}$ E. The structure of E is:

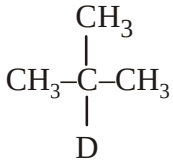
(A) 

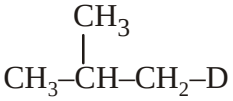
(B) 

(C) 

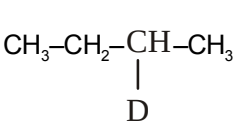
(D) 

886. The compound B $\xrightarrow[Et_2O]{Mg}$ Y $\xrightarrow{D_2O}$ Z. The compound Z is

(A) 

(B) 

(C) $CH_3–CH_2–CH_2–CH_2–D$

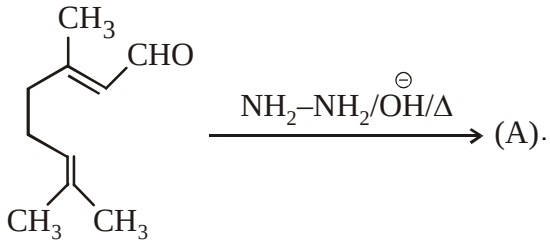
(D) 

ALKENES

COMPREHENSION # 108

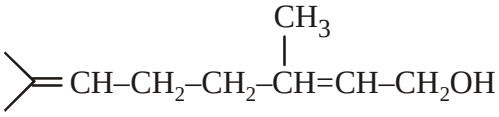
Paragraph for Questions Nos. 887 to 889

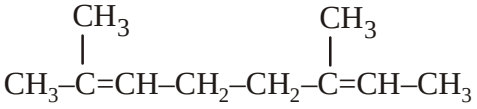
Citral is unsaturated aldehyde found in lemon oil. Fragrance of citral leaves and fruits is due to the presence of this compound.

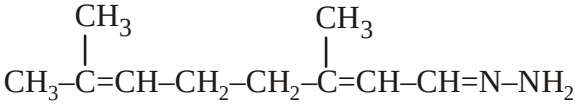
887. 

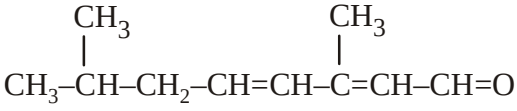
Citral

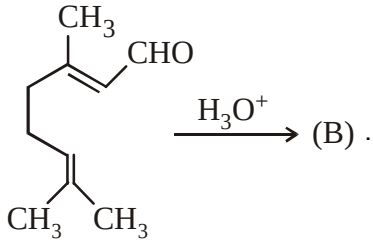
The product (A) is :

(A) 

(B) 

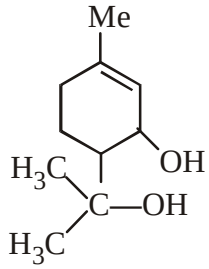
(C) 

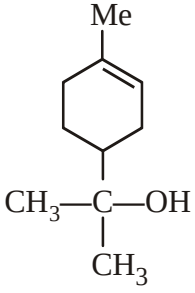
(D) 

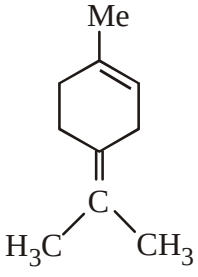
888. 

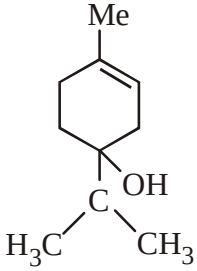
Citral

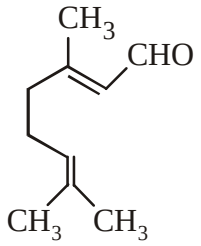
The product (B) is :

(A) 

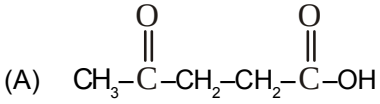
(B) 

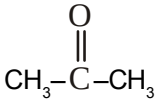
(C) 

(D) 

889.  $\xrightarrow{KMnO_4 / H^{\oplus}}$ products .The product(s) is/are :

Citral

(A) 

(B) 

(C) CO_2

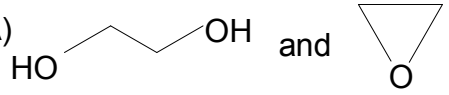
(D) All of these

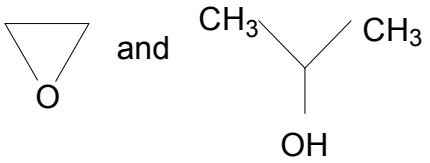
COMPREHENSION # 109

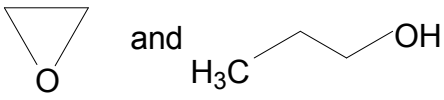
Paragraph for Questions Nos. 890 to 892

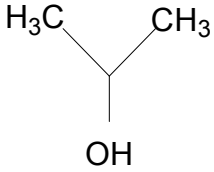
Alkenes can be oxidized in the presence of different reagents to give different products. Alkenes on oxidation in presence of silver at high temperature give cyclic ethers, which also can be synthesized by using per acids Alkenes on reductive ozonolysis give carbonyl compounds in presence of Zinc and H_2O_2. On reaction with acidic $KMnO_4$, it also produces corresponding Carbonyl compound. Alkynes can be also oxidized in presence of such reagents but the products are different.

890. Ethylene on reaction with mCPBA(m-chloro per Benzoic acid) in $CH_2C\ell_2$ forms a compound (X), which on reaction with CH_3MgI and subsequent Hydrolysis gives a compound (Y). (X) and (Y) are respectively

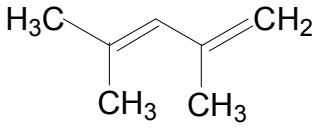
(A) 

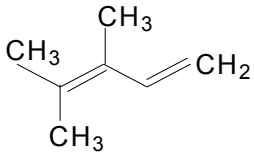
(B) 

(C) 

(D) H_3C - CHO and 

891. An open chain Hydrocarbon (C_7H_{12}) on ozonolysis produces propanone ; methanal and – oxo – propanal. The Hydrocabon could be 2

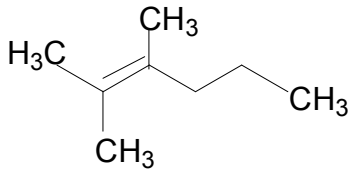
(A) 

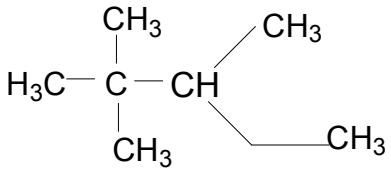
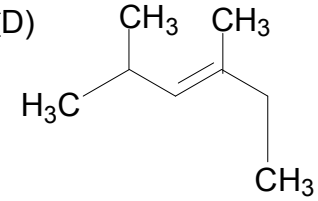
(B) 

(C) Either of these

(D) $CH_3 - CH_2COOH$

892. A Hydrocarbon (C_8H_{16}) on oxidation with a hot acidified solution of $KMnO_4$ forms 2-Butanone and Isobutyric acid as a product. The Hydrocarbon is

(A) $(CH_3)_2 C = C (CH_2 CH_{3)2}$ (B) 

(C)  (D) 

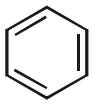
COMPREHENSION # 110

Paragraph for Questions Nos. 893 to 895

An alkene (A) on oxidation with $K_2Cr_2O_7/H_2SO_4$ gives only two moles of gas (X), which turns lime water milky.

893. The 'A' can be:

(A) $H_2C=CH_2$ (B) $CH_2=CH–CH=CH_2$

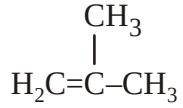
(C)  (D) $CH_2=CH–CH_2–CH=CH_2$

894. 'B' that is next homologous of 'A'. The product/s on oxidation of 'B' are:

(A) Acetic acid (B) Acetic acid and formic acid

(C) Acetone and acetic acid (D) Acetic acid/ CO_2

895. The compound 'C' is the just higher homologous of 'B' but on oxidation does not evolve CO_2. The 'C' is

(A) $H_3C–CH=CH–CH_3$ (B) 

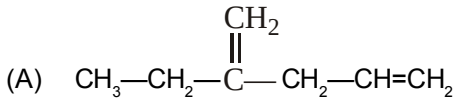
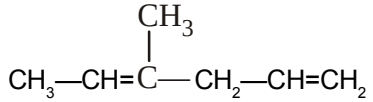
(C) $H_2C=CH–CH_2–CH_3$ (D) None of these

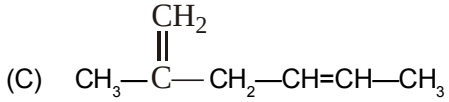
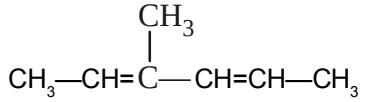
COMPREHENSION # 111

Paragraph for Questions Nos. 896 to 898

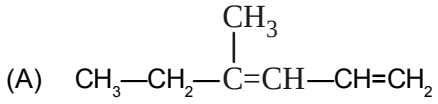
An unsaturated hydrocarbon A (C_7H_{12}) absorbs 2 molecule of hydrogen when hydrogenated. On oxidation it gives one molecule each of acetic acid, and acetoacetic acid and on reduction give 2-methylhexane :

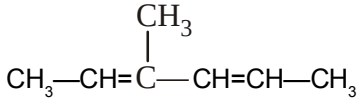
896. The structure of A:

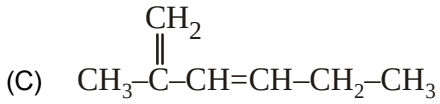
(A)  (B) 

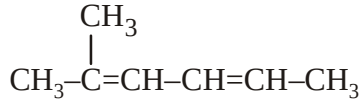
(C)  (D) 

897. The compound A on heating produces a more stable compound:

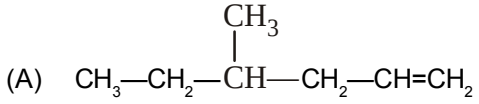
(A) 

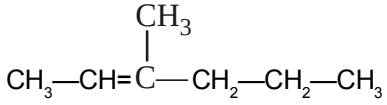
(B) 

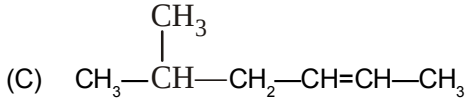
(C) 

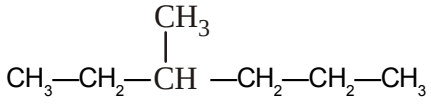
(D) 

898. The A on Birch Reduction with Na/Lq.NH_3 gives:

(A) 

(B) 

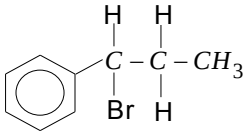
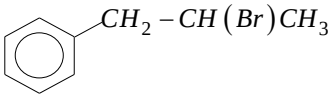
(C) 

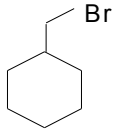
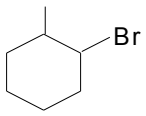
(D) 

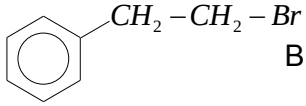
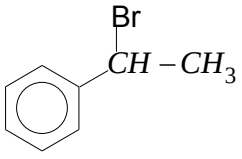
COMPREHENSION # 112
Paragraph for Questions Nos. 899 to 901

Dehydrobromination of (A) & (B) gives same alkene (C). Alkene (C) can regenerate (A) & (B) by the addition of HBr in presence & absence of peroxide respectively. 1, 1 – diphenyl ethane is obtained on reaction of (C) with benzene in the presence of H^+ ions.

899. Compound 'A' & 'B' are

(A) A :  B : 

(B) A :  B : 

(C) A :  B : 

(D) None

900. Hydrolysis of (A) & (B) gives isomeric products (D) & (E). Which of the following statement for D & E is not true ?

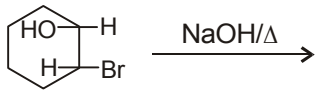
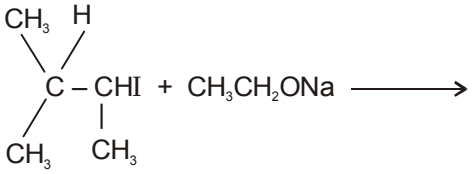
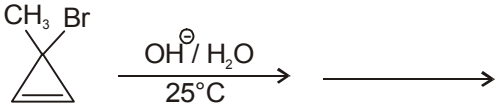
(A) Both D & E gives iodoform test
(B) Both D & E gives same alkene upon dehydration
(C) Both D & E reacts with NaOH
(D) None of these

901. A when treated with NBS & then with $NaNH_2$ gives (X), when (X) is reacted with H_2O / H^+ it gives :-

(A) Phenol (B) Acetophenone (C) Benzoic acid (D) None of these

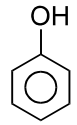
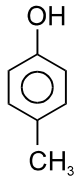
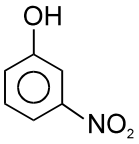
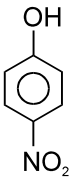
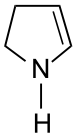
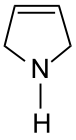
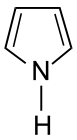
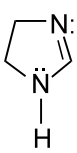
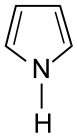
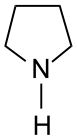
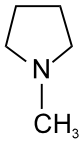
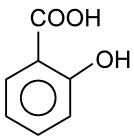
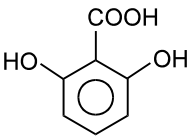
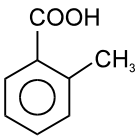
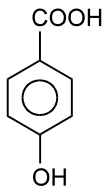
SECTION IV: MATCH THE FOLLOWING

902. Match the reactions with their mechanism types

	List - I	List - II
(a)	$CH_3COCl + NaOH \xrightarrow{25°C}$	(P) S_N1 reaction
(b)		(Q) E2 reaction
(c)		(R) S_N2 (NGP)
(d)		(S) S_N2 (tetrahedral intermediate)

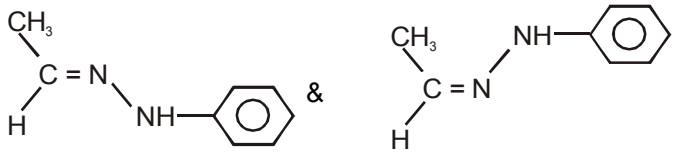
Ans. a → S b → R c → Q d → P

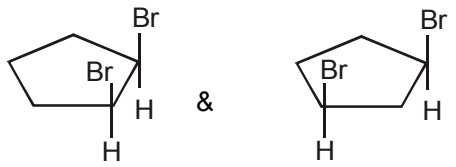
903. Match the following compounds.

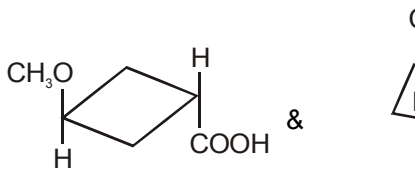
Column - A					Column - B
	I	II	III	IV	
(A)					(P) II > I > III > IV (Acid strength)
(B)					(Q) I > III > IV > II (Basic strength)
(C)					(R) II > IV > I > III (Basic strength)
(D)					(S) IV > III > I > II (Acid strength)

904. Match the following :

Identify the relationship between following pairs and match for the correct option in next column.

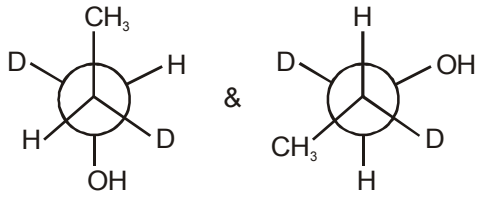
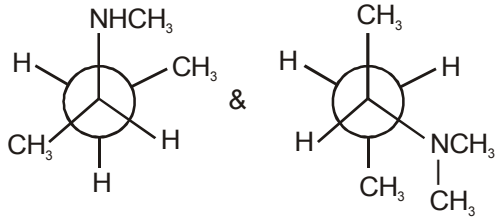
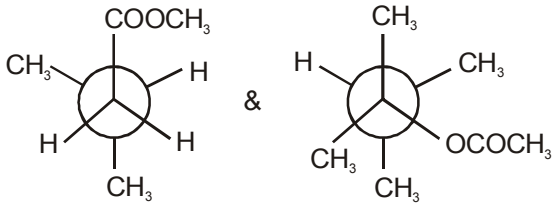
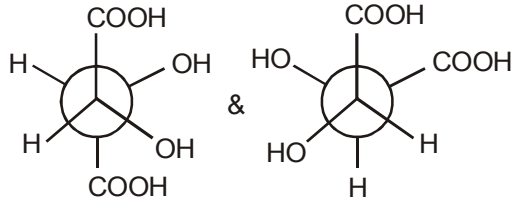
(a)  (P) Functional

(b)  (Q) Position

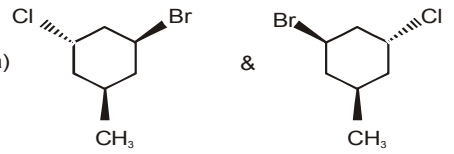
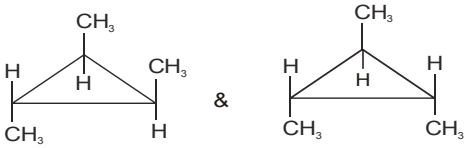
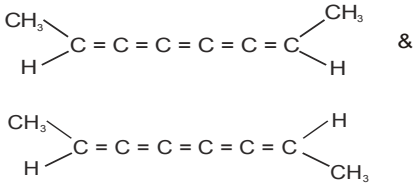
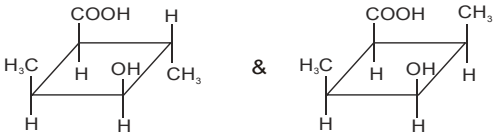
(c)  (R) Geometrical

(d)  (S) Metamers

905. Match the following

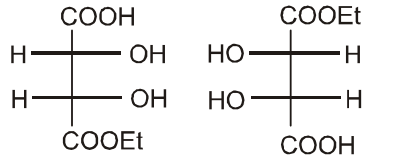
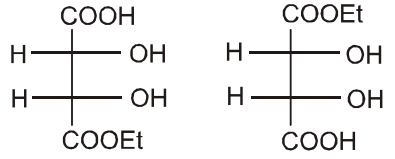
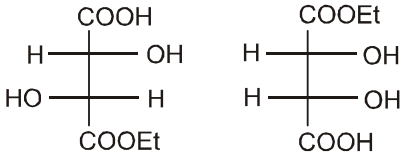
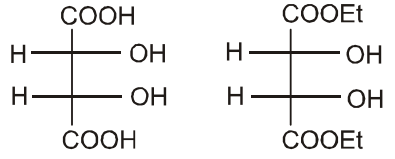
Column I	Column II
(a) 	(P) Configurational Diastereomer
(b) 	(Q) Homologs
(c) 	(R) Configurational Enanatiomer
(d) 	(S) Metamers

906.

Column - I	Column - II
(a) 	(P) Optical isomers only
(b) 	(Q) identical
(c) 	(R) Geometrical isomers only
(d) 	(S) Both optical and geometrical

Match the following

907. Match the relationship and properties of the compounds of different pairs given in column I. Only one option of 'I' matches with one option of II and III.

(I) Compounds	(II) Relationship	(III) Properties
(A) 	(J) Enantiomers	(P) These are superimposable over each other
(B) 	(K) Optical Diastereomers	(Q) These have identical density but are nonsuperimposable over each other
(C) 	(L) Meso Compounds	(R) Thse have different value (magnitude) of optical rotation
(D) 	(M) Identical Compounds	(S) Each one of these have two similar chiral centres

907. Nature of mechanism in terms of unknown A, B, C, D

Column I		Column II	
(a)	$CH_3Cl \xrightarrow{A} CH_3OH$	(P)	S_N1
(b)	$(CH_3)_3CCl \xrightarrow{B} (CH_3)_3C–OH$	(Q)	E_2
(c)	$CH_3–\underset{\displaystyle CH_3}{\underset{\vert}{CH}}–CH_2–\underset{\displaystyle Br}{\underset{\vert}{CH_2}} \xrightarrow{C} CH_3–\underset{\displaystyle CH_3}{\underset{\vert}{C}}=CH–CH_3$	(R)	S_N2
(d)	$CH_3–\underset{\displaystyle CH_3}{\underset{\vert}{CH}}–CH_2–\underset{\displaystyle Br}{\underset{\vert}{CH_2}} \xrightarrow{D} \underset{\displaystyle CH_3}{\underset{\vert}{CH}}–CH=CH_2$	(S)	E_1

XII:

SECTION I: SINGLE OPTION CORRECT

908. A basic substance, A(C_7H_9N), reacts with sodium nitrite and hydrochloric acid at 0ºC to give a salt, B ($C_7H_7ClN_2$). When a solution of B in dilute hydrochloric acid was heated with aqueous copper (I) cyanide and potassium cyanide, a product was obtained which upon complete hydrolysis gave an acid, C($C_8H_8O_2$). This acid could be oxidized to another acid which, on heating, formed an anhydride, D($C_8H_4O_3$). Compound A is:

(A) benzylamine (B) p-toluidine

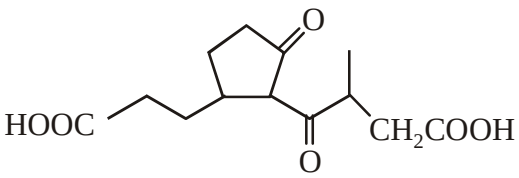
(C) mono-methylaniline (D) o-toludine

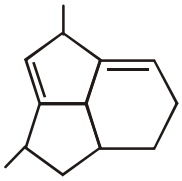
909. Vinyl methyl ether reacts with Cl_2 water. The main product obtained in this reaction is

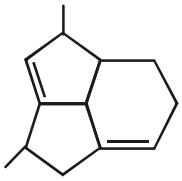
(A) $CH_2(OH)-CH(Cl)-OCH_3$ (B) $ClCH_2-CHO$

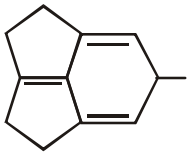
(C) $CH_2-CH(-O-)-OCH_3$ (D) CH_3-CHO

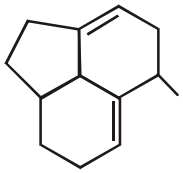
910. Which molecule will give the following decarboxylic acid upon treatment with acidic solution of $KMnO_4$?



(A) 

(B) 

(C) 

(D) 

911. The reaction conditions leading to best yields of $Br - CH_2 - CH = CH_2$ is :

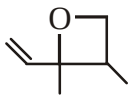
(A) $CH_3 - CH = CH_2 + Br_2/CCl_4 \xrightarrow{h\nu}$

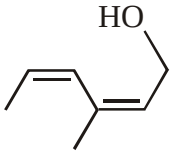
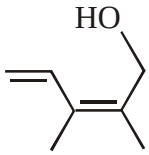
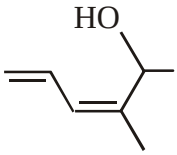
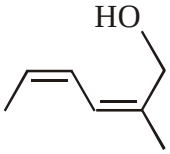
(B) $CH_3 - CH = CH_2 + Br_2 \xrightarrow[\text{vapourphase}]{h\nu}$

(C) $CH_3 - CH = CH_2 + Br_2 \xrightarrow[\text{vapour phase}]{\text{high temp.}}$

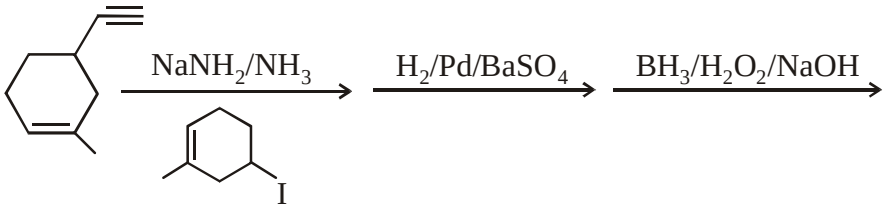
(D) $CH_3 - CH = CH_2 + Br_2/CCl_4 \xrightarrow{Fe}$

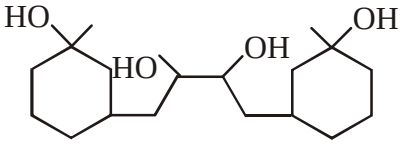
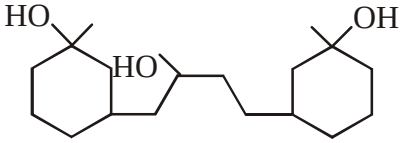
912. When treated with acid, the strained ether shown below is protonated on oxygen, and ring opens to give a resonance-stabilized carbocation. Which diene listed below when treated with acid will give the same carbocation.

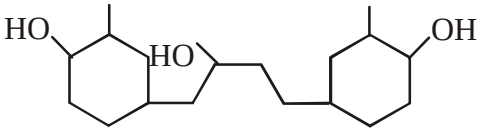
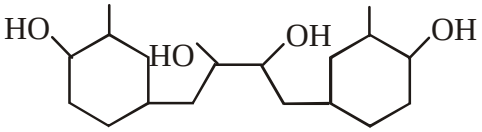


(A)  (B)  (C)  (D) 

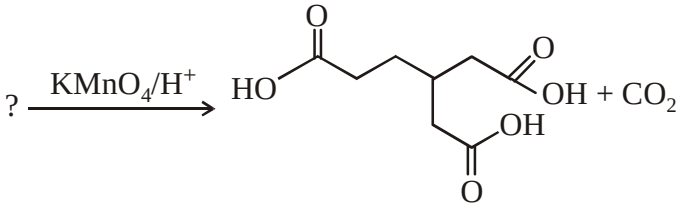
913. What is the product of the following sequence of reaction?

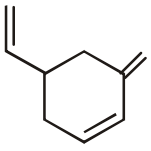
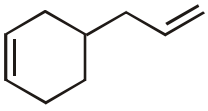


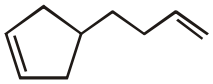
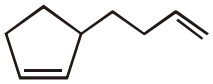
(A)  (B) 

(C)  (D) 

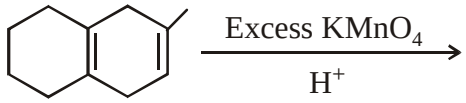
914. Which of the following compounds was the starting material for the oxidation shown below?

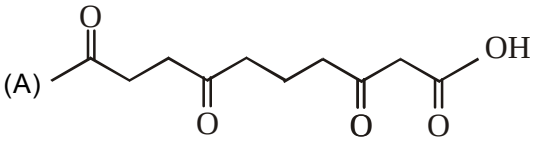


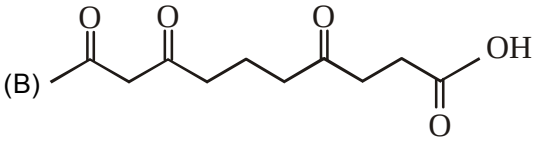
(A)  (B) 

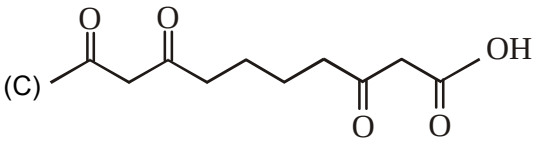
(C)  (D) 

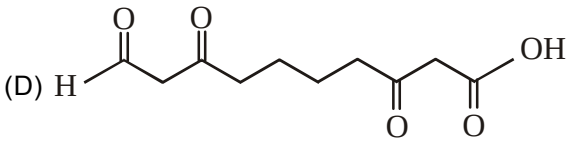
915. What is the final product of the following reaction?



(A) 

(B) 

(C) 

(D) 

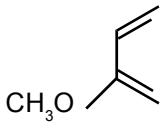
916. The major product on debromination of 1, 2, 3 – Tri bromopropane with alcoholic KOH is :

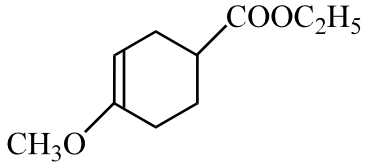
(A) $CH_2 = \underset{\displaystyle Br}{\underset{|}{C}} - \underset{\displaystyle Br}{\underset{|}{CH_2}}$

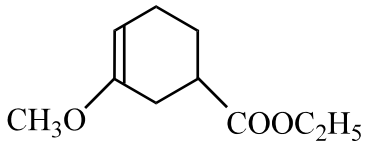
(B) $\underset{\displaystyle Br}{\underset{|}{CH}} = \underset{\displaystyle Br}{\underset{|}{CH}} - CH_2$

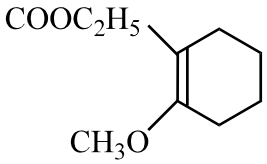
(C) $CH_2 = C = CH - Br$

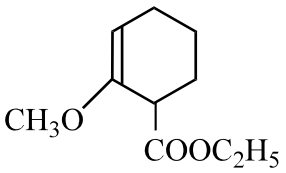
(D) $\underset{\displaystyle OH}{\underset{|}{CH_2}} - \underset{\displaystyle OH}{\underset{|}{CH}} - \underset{\displaystyle OH}{\underset{|}{CH_2}}$

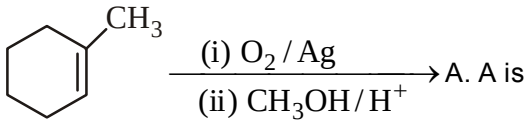
917.  + $CH_2 = CH - COOC_2H_5 \longrightarrow$ The major product is:

(A) 

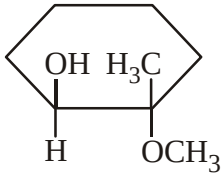
(B) 

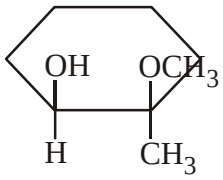
(C) 

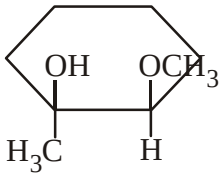
(D) 

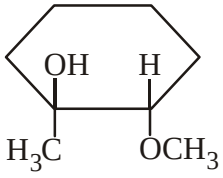
918. 

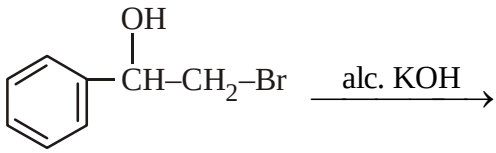
A. A is

(A) 

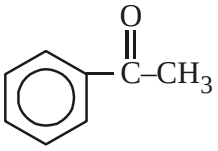
(B) 

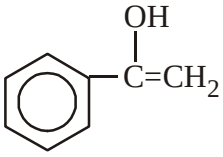
(C) 

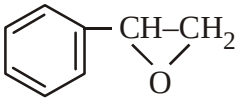
(D) 

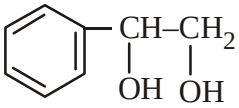
919. 

The product is

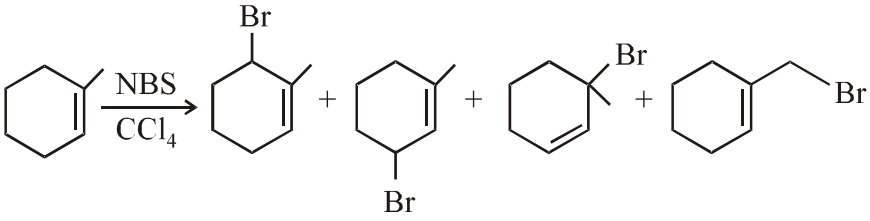
(A) 

(B) 

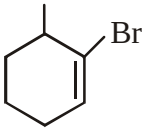
(C) 

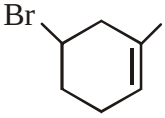
(D) 

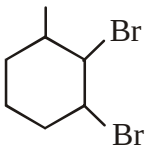
920. Consider the following reaction of 1-methyl cyclohexene with NBS. Four likely products of the reaction are shown below. One of the likely products is not shown, however.

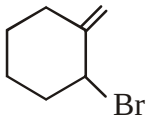


Which of the following is the missing product?

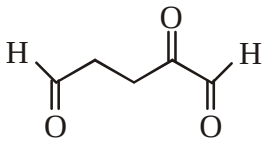
(A) 

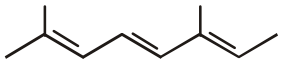
(B) 

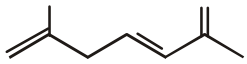
(C) 

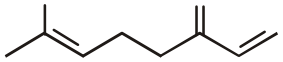
(D) 

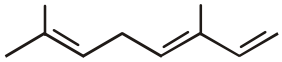
921. Compound X on catalytic hydrogenation gives 2,6-dimethyloctane. On ozonolysis followed by treatment with Zn–H_2O, X yields formaldehyde, acetone and a dialdehyde shown below. The most likely structure of starting compound X is:



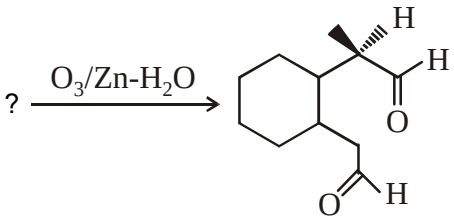
(A) 

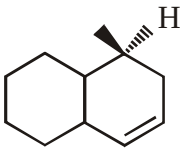
(B) 

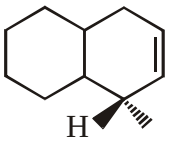
(C) 

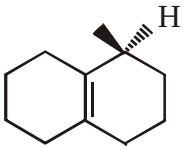
(D) 

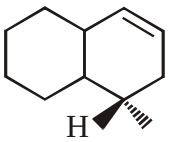
922. Select the best starting material for the following reaction:



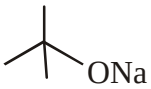
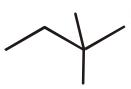
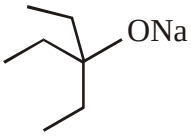
(A) 

(B) 

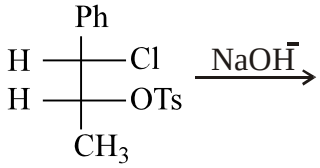
(C) 

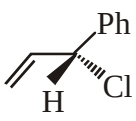
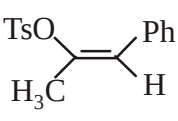
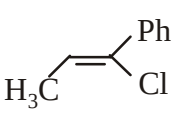
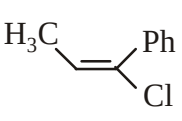
(D) 

923. When 2-bromo-2, 3-dimethylbutane reacts with any of the bases shown below under E_2 conditions, two alkenes are produced: 2,3-dimethyl-1-butene and 2,3-dimethyl-2-butene. Which one of the above base would produce the highest yield of 2,3-dimethyl-butene?

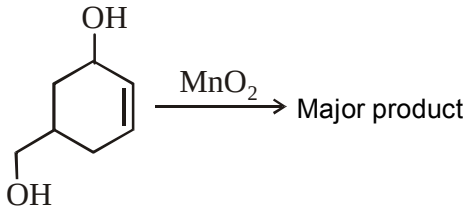
(A) CH_3CH_2ONa (B)  (C)  (D) 

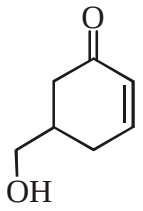
924. Which will be the major product of the following:

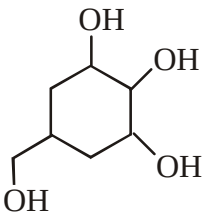


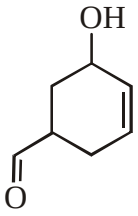
(A)  (B)  (C)  (D) 

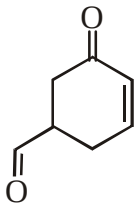
925. Give the major product of the following reaction:



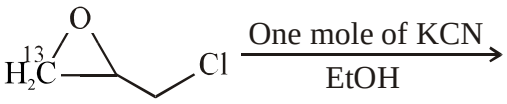
(A) 

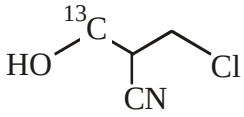
(B) 

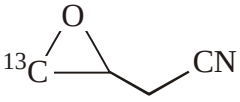
(C) 

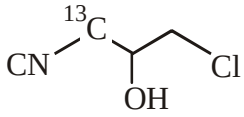
(D) 

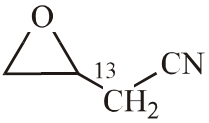
926. If the following *C labelled compound undergo the following reaction, which product would be obtained.



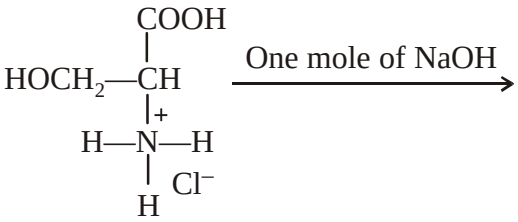
(A) 

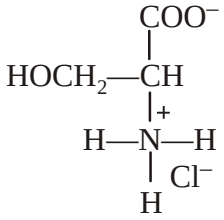
(B) 

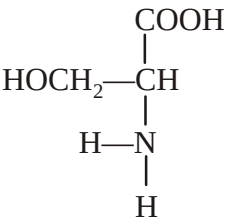
(C) 

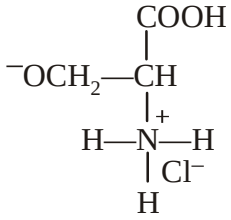
(D) 

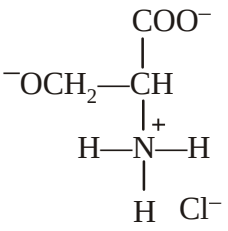
927. What is the major product from the following reaction?



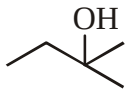
(A) 

(B) 

(C) 

(D) 

928. Which of the following is (are) not a feasible Grignard synthesis:

(i) $CH_3CH_2COOCH_3 + CH_3MgBr \xrightarrow{H_3O^+}$ 

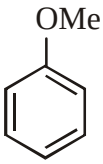
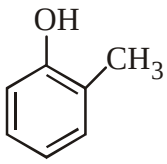
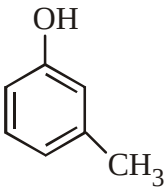
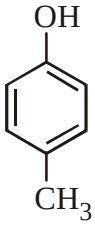
(ii) $HC{\equiv}C{-}CH_2CHO + CH_3MgBr \xrightarrow{H_3O^+} HC{\equiv}C{-}CH_2CHCH_3$ (OH)

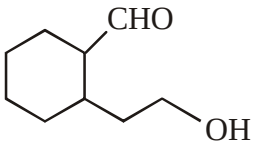
(iii) $CH_3CH(Cl)CH_2CHO + CH_3MgBr \xrightarrow{H_3O^+} CH_3CH(Cl)CH_2CH(OH)CH_3$

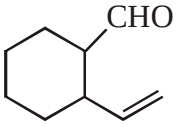
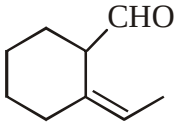
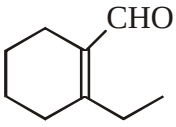
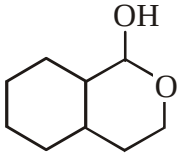
(iv)  $+ CH_3MgBr \xrightarrow{H_3O^+} CH_3CH_2CH_2OH$

(A) (i), (ii) (B) (i), (iii) (C) (ii), (iii) and (iv) (D) (ii) and (iii)

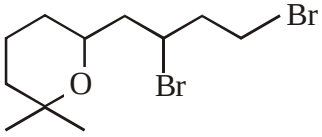
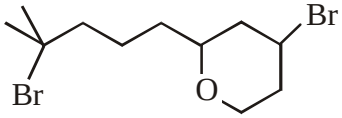
929. A compound X(C_7H_8O) is is insoluble in water, dilute HCl and aqueous $NaHCO_3$ but dissolve in dilute NaOH. When X is treated with bromine-water, it is converted into a compuond of formula, $C_7H_5OBr_3$. Compund X is:

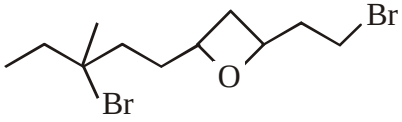
(A)  (B)  (C)  (D) 

930.  $\xrightarrow{H^+}$ Major

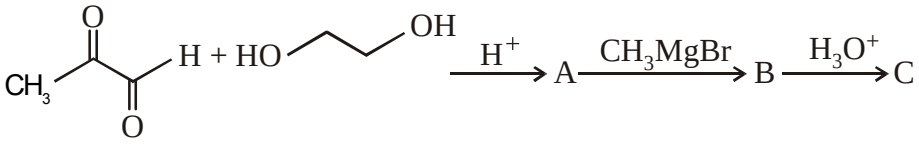
(A)  (B)  (C)  (D) 

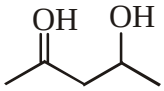
931. When 1,3,9-tribromo-9-methyl-5-decanol is treated with a strong base, the major product will be?

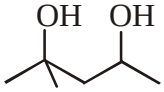
(A)  (B) 

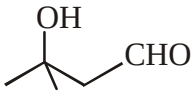
(C)  (D) None

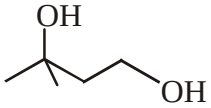
932. What is the product, C of the following sequence of reactions?



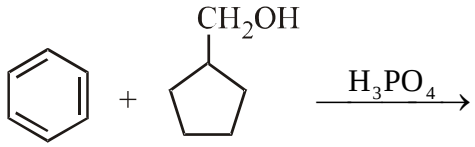
(A) 

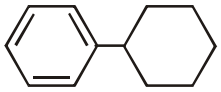
(B) 

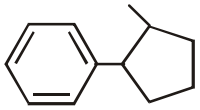
(C) 

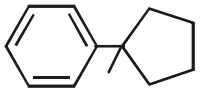
(D) 

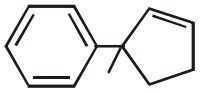
933. Give the major product of the following reaction:



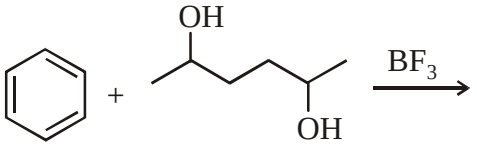
(A) 

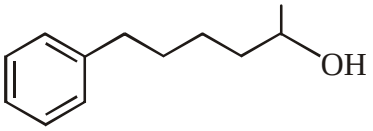
(B) 

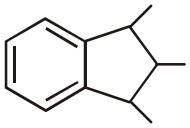
(C) 

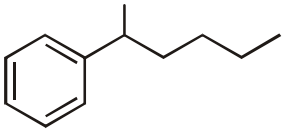
(D) 

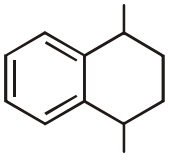
934. Give the major product of the following reaction:



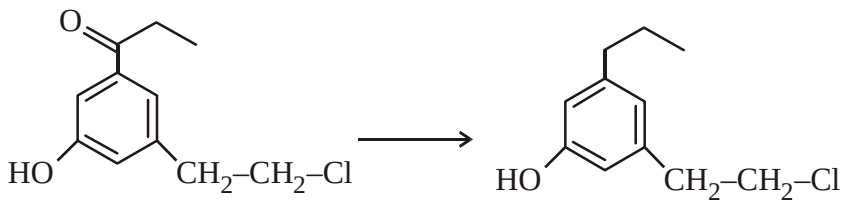
(A) 

(B) 

(C) 

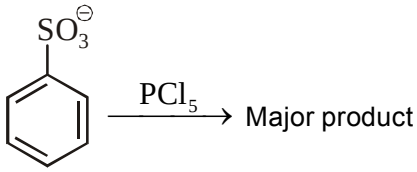
(D) 

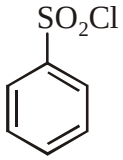
935. Which of the following reagent should not be used for the following conversion

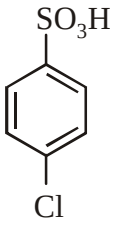


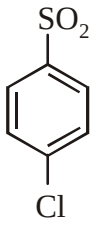
(A) Zn–Hg/HCl
(B) NH_2–NH_2/OH^-
(C) P + HI
(D) All of these

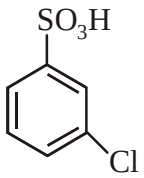
936. Give the major product of the following reaction:



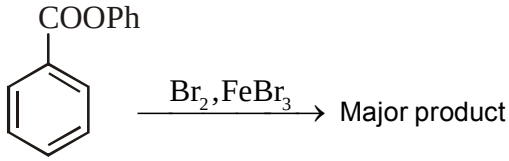
(A) 

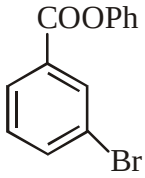
(B) 

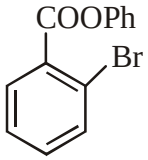
(C) 

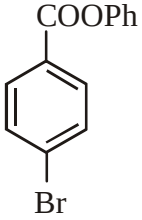
(D) 

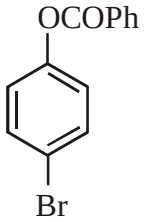
937. Give the major product of the following reaction:



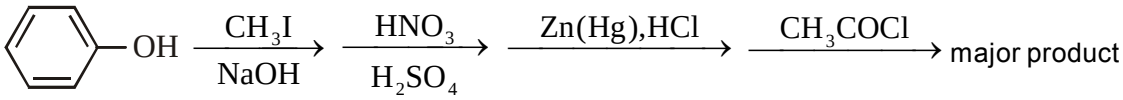
(A) 

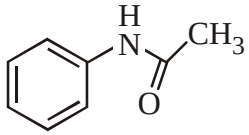
(B) 

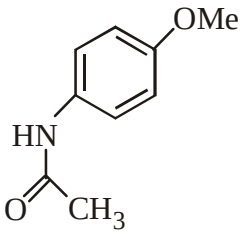
(C) 

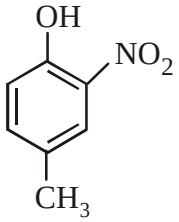
(D) 

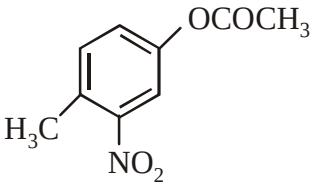
938. Give the major product from the following reaction sequence:

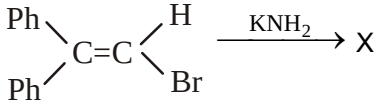


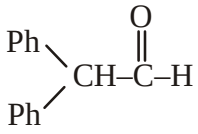
(A) 

(B) 

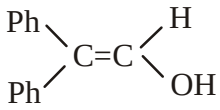
(C) 

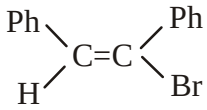
(D) 

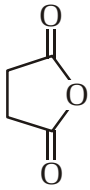
939. 

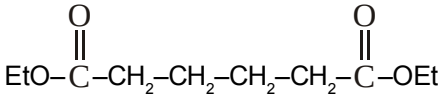
(A) 

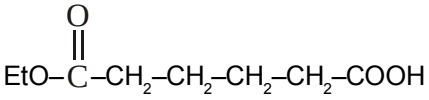
(B) Ph–C≡C–Ph

(C) 

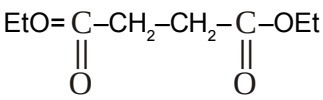
(D) 

940.  + EtOH $\xrightarrow{\Delta}$? $\xrightarrow{e^-}$? The final proudct is:

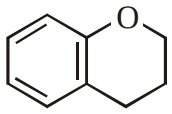
(A) 

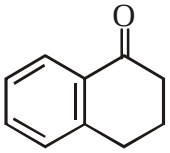
(B) 

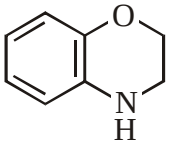
(C) $CH_2=CH_2$

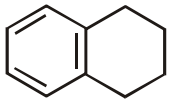
(D) 

941. Rank the following compunds in decreasing order of reactivity in electrophilic aromatic substitution reaction:–

(I) 

(II) 

(III) 

(IV) 

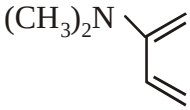
(A) IV > I > III > II

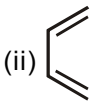
(B) III > I > IV > II

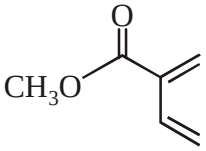
(C) I > III > IV > II

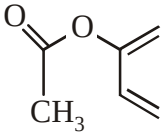
(D) III > II > I > IV

942. Increasing rate of reaction in a Diels-Alder reaction

(i) 

(ii) 

(iii) 

(iv) 

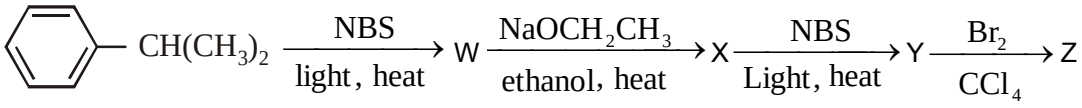
(A) iii < ii < iv < i

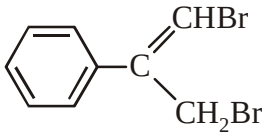
(B) ii < i < iv < iii

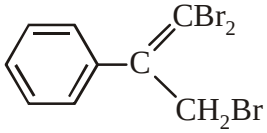
(C) i < iv < iii < ii

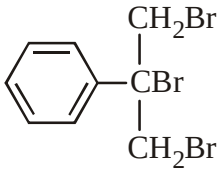
(D) iv < iii < ii < i

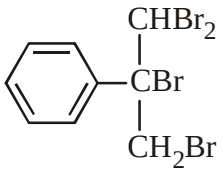
943. What is compound Z?



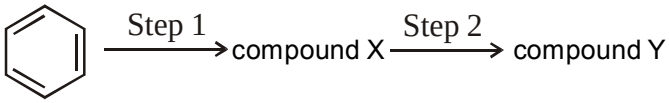
(A) 

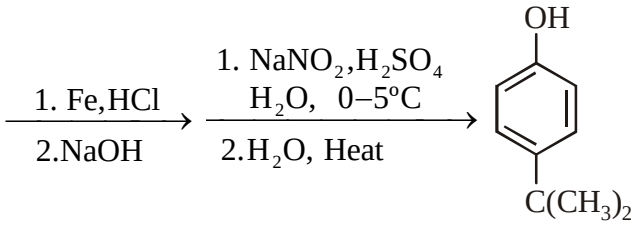
(B) 

(C) 

(D) 

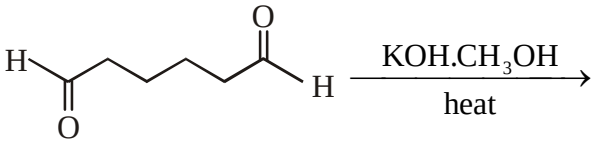
944. Which reagent is best suited for step 1 in the synthesis shown?

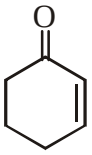


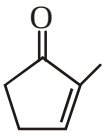


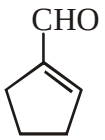
(A) A mixture of HNO_3 and H_2SO_4
(B) $(CH_3)_3CCl$, $AlCl_3$
(C) Br_2, $FeBr_3$
(D) N-bromosuccinimide, benzoyl peroxide, CCl_4, heat

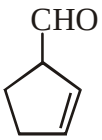
945. What is the product of the following intramolecular aldol condensation reaction?



(A) 

(B) 

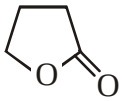
(C) 

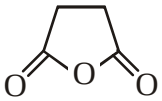
(D) 

946. Which one of the following reacts with ammonia at the fastest rate?

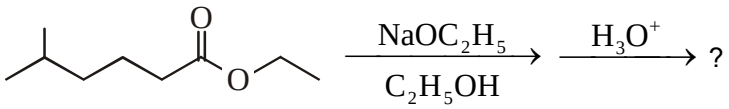
(A) 

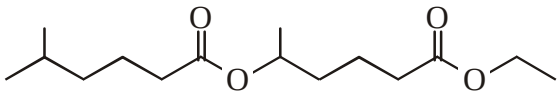
(B) 

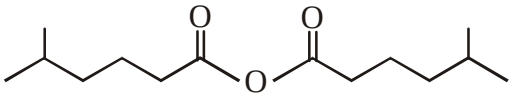
(C) 

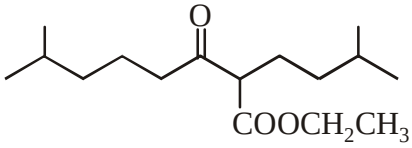
(D) 

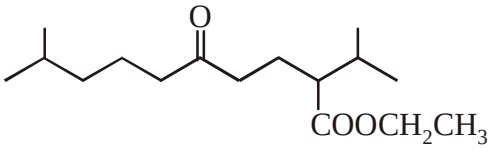
947. What is the major product of the following reaction?



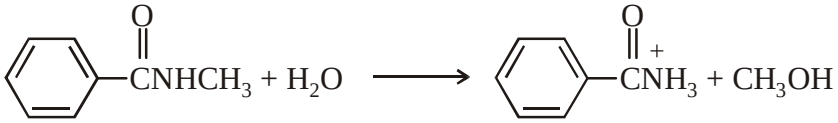
(A) 

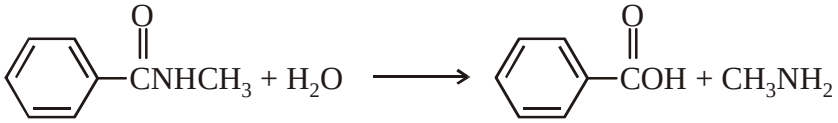
(B) 

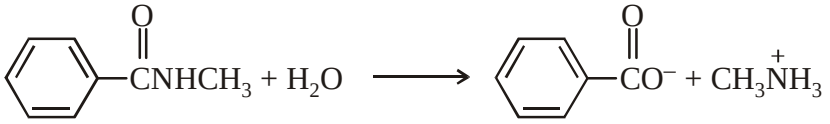
(C) 

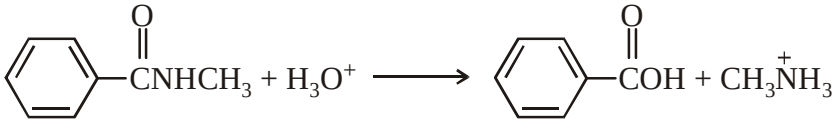
(D) 

948. Which balanced equation best describes the hydrolysis of the compound shown? The reaction is carried out at a pH of 2.

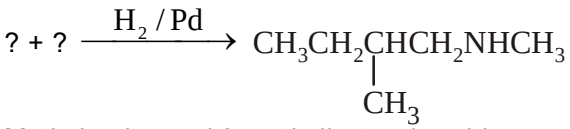
(A) 

(B) 

(C) 

(D) 

949. Which pair of reagents would be used to make the following amine by reductive amination?



(A) Methylamine and 2-methylbutanoic acid
(B) Methylamine and 2-methylbutanal
(C) Ammonia and 3-methyl-2-pentanone
(D) dimethylamine and 2-butanone

950. Which of the following synthetic routes gives the best yield of meta-bromoaniline starting with benzene?

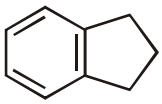
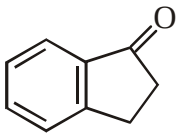
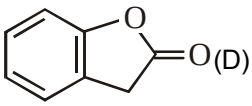
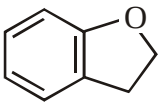
(A) Benzene $\xrightarrow[FeBr_3]{Br_2} \xrightarrow[H_2SO_4]{HNO_3} \xrightarrow[(2)\ NaOH]{(1)\ Sn,\ HCl}$

(B) Benzene $\xrightarrow[H_2SO_4]{HNO_3} \xrightarrow[(2)\ NaOH]{(1)\ Sn,\ HCl} \xrightarrow[FeBr_3]{Br_2}$

(C) Benzene $\xrightarrow[H_2SO_4]{HNO_3} \xrightarrow[FeBr_3]{Br_2} \xrightarrow[(2)\ NaOH]{(1)\ Sn,\ HCl}$

(D) Benzene $\xrightarrow[(2)\ NaOH]{(1)\ Sn,\ HCl} \xrightarrow[H_2SO_4]{HNO_3} \xrightarrow[FeBr_3]{Br_2}$

951. Which of the following undergoes electrophilic aromatic substitution at the fastest rate?

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

SECTION II: MORE THAN ONE OPTION CORRECT

952. In which of the following compounds formation of diazocompound is not possible

(A) $C_6H_5NH_2$ (B) $C_6H_4(NH_2)(CH_3)$

(C) $C_6H_5CH_2NH_2$ (D) $C_6H_5N(CH_3)_2$

953. Diazomethane reacts with

(A) RCOOH (B) RCH_2OH in presence of HBF_4

(C) C_6H_5OH in presence of NaOH (D) Alkenes

954. Which of the following polymers are used as fuels in rocket propellents:

(A) Acrylic rubber (B) Chloroprene (C) Polybutadiene (D) Polyurethane

955. Which of the following carbohydrates on treatment with excess of phenylhydrazine gives same osazone

(A) Glucose (B) nannose (C) fructose (D) Galactose

956. Which are generally used for preparing derivative of aldehydes and ketones.

(A) hydroxylamine hydrochloride (B) 2,4-dinitrophenylhydrazine

(C) Phenylhydrazine hydrochloride (D) hydrogen cyanide

957. P-chloro anilline and anillinium hydrochloride can be distinguished by

(A) Carbylamine test (B) $NaHCO_3$

(C) $AgNO_3$ (D) Sandmeyers reaction

958. A new carbon-carbon bond formation is possible in:

(A) Cannizaro's reaction (B) Friedel-Crafts alkylation

(C) Clemmenson reduction (D) Riemer Tiemann reaction

959. When methyl Iodide is treated with ammonia, the product obtained is
(A) Methyl amine (B) Dimethyl amine (C) Trimethylamine (D) None

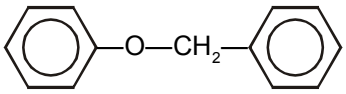
960. Which of the following are hydroxy acids
(A) Lactic acid (B) Tartaric acid (C) Citric acid (D) Succinic acid

961. Carboxylic acids can be directly reduced to primary alcohols by
(A) $LiAlH_4$ (B) $Na + C_2H_5OH$ (C) $NaBH_4$ (D) H_2

962. A mixture of calcium acetate and calcium formate are heated then they yield
(A) Acetone (B) Acetaldehyde (C) formic acid (D) Acetic acid

963. Which will under go aldol condensation?
(A) Acetaldehyde (B) Propanaldehyde
(C) Benzaldehyde (D) Trideutroacetaldehyde

964. For acetone and aldehyde which of the followning statements are true.
(A) Both react with HCN (B) Both gives Iodoform test
(C) Both react with NaOH to give polymer (D) Both can be reduced to alcohols

965. When  treated with HI produces
(A) $C_6H_5CH_2I$ (B) C_6H_5OH (C) C_6H_5I (D) $C_6H_5CH_2OH$

966. Ethyl alcohol on oxidation with $K_2Cr_2O_7$ gives
(A) Formic acid (B) Formaldehyde (C) Acetic acid (D) Acetaldehyde

967. When ethyl bromide reacts with alcoholic $AgNO_2$ it yields
(A) Ethane (B) Ethene (C) nitroethane (D) Ethylnitrite

968. Which of the following are organo metallic compound?
(A) $CH{\equiv}CNa$ (B) C_2H_5SNa (C) C_2H_5MgI (D) C_2H_5ONa

969. The reaction of the following with I_2/NaOH gives yellow precipitate
(A) $ICH_2COCH_2CH_3$ (B) $CH_3COOCOCH_3$
(C) CH_3CONH_2 (D) $CH_3CH(OH)CH_2CH_3$

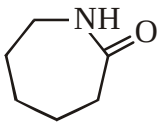
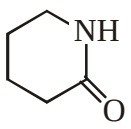
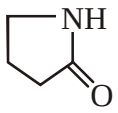
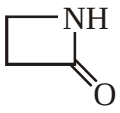
970. Which of the following will not give a ppt with $AgNO_3$:
(A) $CHCl_3$ (B) KCl (C) CCl_4 (D) H_3Cl

SECTION III: COMPRHENSIONS

COMPREHENSION # 113

Paragraph for Questions Nos. 971 to 973

An organic lactum (A) on acid hydrolysis produced B an amino acid. B on treatment with nitrous acid gives (C). (C) on heating with concentrated H_2SO_4 produces a lactone (D). (A) can also be synthesized by the reaction of cyclopentanone with hydroxylamine followed by treatment of product with concentrated H_2SO_4.

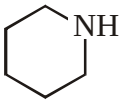
971. The structure of lactam is
(A)  (B)  (C)  (D) 

972. The lactone (C) on reaction with $LiAlH_4$ gives

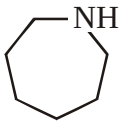
(A) 1,6-hexanediol (B) 1,5-pentanediol

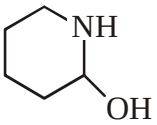
(C) 1,4-butanediol (D) 1,7-heptanediol

973. The lactam A upon reaction with $LiAlH_4$. Produces.

(A) 

(B) 

(C) 

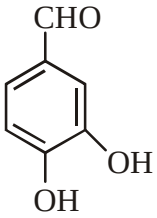
(D) 

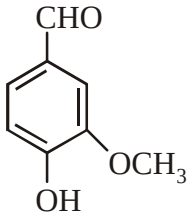
COMPREHENSION # 114

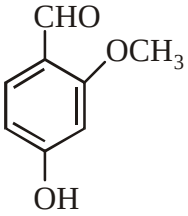
Paragraph for Questions Nos. 974 to 976

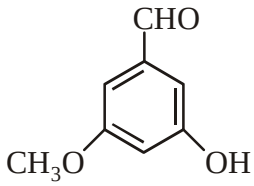
Vanillin (A) $C_8H_8O_3$ is isolated from vanilla beans, which gives intense blue colour with neutral $FeCl_3$ and also gives the tollen's test. It reacts with conc. HBr to give a compound B. One mole of vanillin gave one mole of AgI with zeise's methoxy estimations. Compund B on oxidation with Tollen's reagent gave catechol and also can be prepared from catechol by Gattermann KOCH reaction.

974. The structure of A is

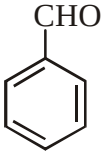
(A) 

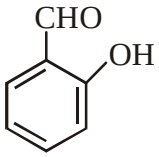
(B) 

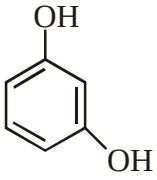
(C) 

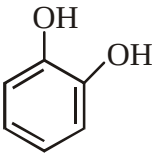
(D) 

975. Compound B on heating with Zinc dust will give 'X'. 'X' is

(A) 

(B) 

(C) 

(D) 

976. In the above question If X reacts with acetic anhydride in presence of CH_3COONa at 180ºC gives.

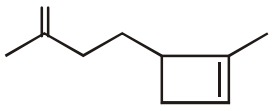
(A) Cinnamic acid (B) Crotonic acid (C) Pyruvic acid (D) Acetic acid

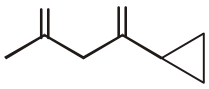
COMPREHENSION # 115

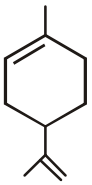
Paragraph for Questions Nos. 977 to 979

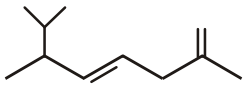
Limonene (A) is a naturaly occuring hydrocarbon with fragence of lemons. When (A) is hydogenated over Pd/C it absorbs 2 moles of hydrogen and produce 4-methyl-1-isopropyl cyclohexane. When (A) is treated with Ozone, followed by reduction two products are isolated i.e. formaldehyd and diketone.

977. The structure of 'A' is:

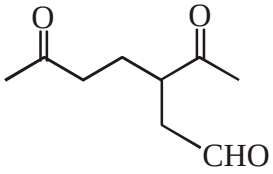
(A) 

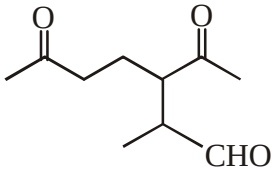
(B) 

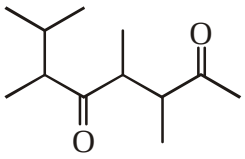
(C) 

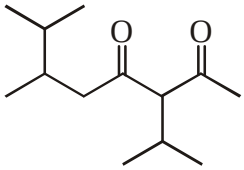
(D) 

978. Identify the diketone,

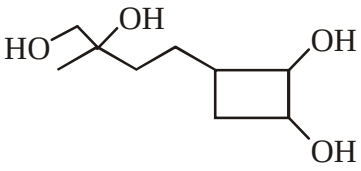
(A) 

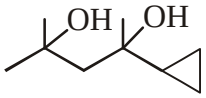
(B) 

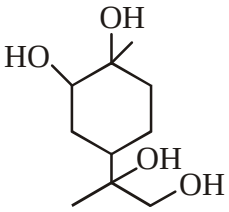
(C) 

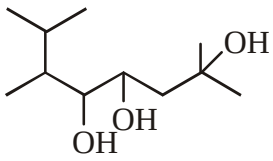
(D) 

979. The compound A on reaction with OsO_4 gives

(A) 

(B) 

(C) 

(D) 

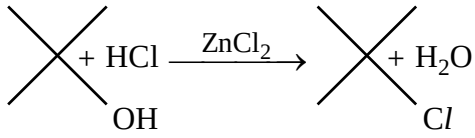
ALCOHOLS

COMPREHENSION # 116

Paragraph for Questions Nos. 980 to 982

Alcohol and considered as a best starting material far preparing alkyl halides. Most common reagent used for this are HX, PCl_5, PCl_3, $SOCl_2$. Among the halogen acid the order of reactivity is HI > HBr > HCl > HF & for Alcohol 3° > 2° > 1° CH_3–OH.

In the case of 1° Alcohol when we use HX rearrangement occurs and mixture of product farm but if we use PCl_3 or $SoCl_2$ it occurs v/a SN^2.

980.  this reaction occurs

(A) within a minutes (B) when temperature is 0 – 100°c

(C) after 5 minutes (D) Reaction does not take place

981. Which of the following is not true

(A) $SOBr_2$ is less stable and SOI_2 does not exist

(B) In preparing alkyl halide from Alcohol the best method is application of $SOCl_2$

(C) 3° Alcohal react with HX via SN^1 pathway.

(D) optically active alcohal (1°) react with PCl_3 give the racemic mixture

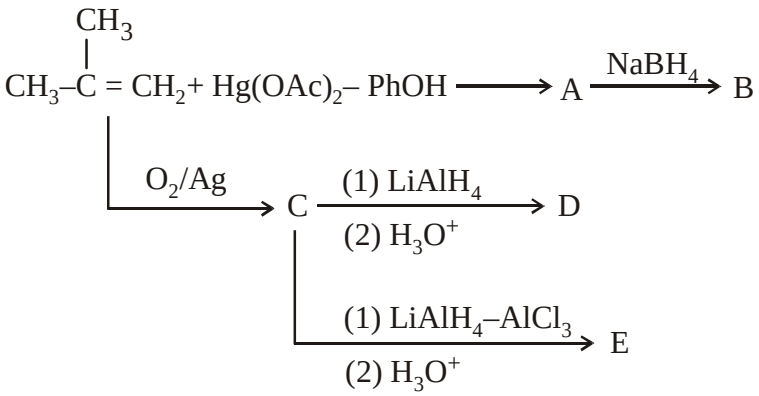
982. R – OH + A $\rightarrow$ R – C*l*

Which of the following should be taken as A to give the highest yield & no separation of product will required ?

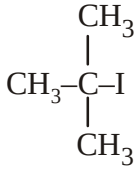
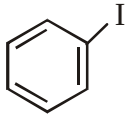
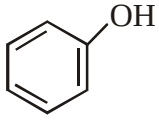
(A) PCl_5 (B) PCl_3 (C) $SOCl_2$ (D) $HCl/ZnCl_2$

COMPREHENSION # 117

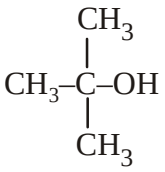
Paragraph for Questions Nos. 983 to 985

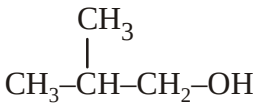


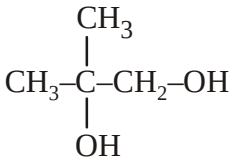
983. The compound B $\xrightarrow{HI}$

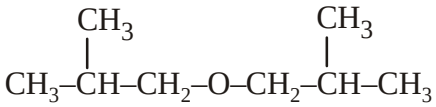
(A)  (B)  (C)  (D) Both (A) and (C)

984. The compound D is:

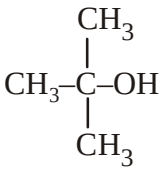
(A) 

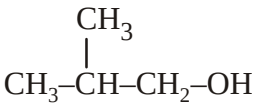
(B) 

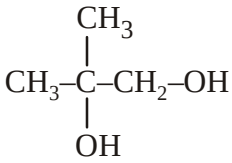
(C) 

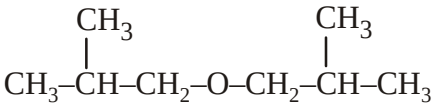
(D) 

985. The compound E is:

(A) 

(B) 

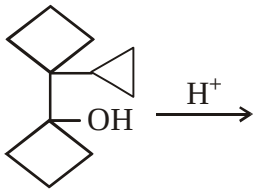
(C) 

(D) 

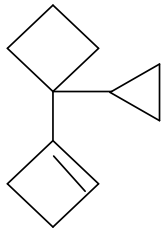
COMPREHENSION # 118

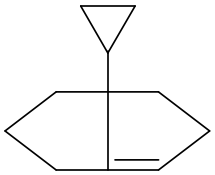
Paragraph for Questions Nos. 986 to 988

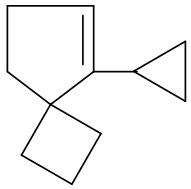
Protonation of organic compounds gives a lots of product having great synthetic application. Alcohols, alkenes and many other groups react with H^+ ion to give carbocation which may undergo rearrangement to from stable carbocation. In general the stability of carbocation is $3^0 > 2^0 > 1^0$

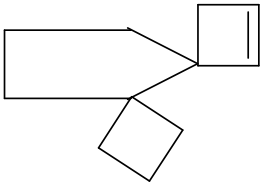
986. 

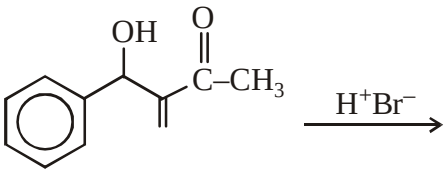
Rearranged alkene product after rearrangement at low temperature will be mainly

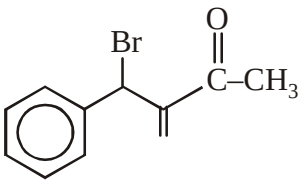
(A) 

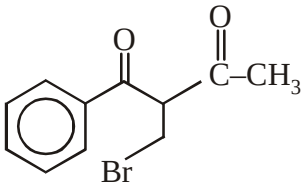
(B) 

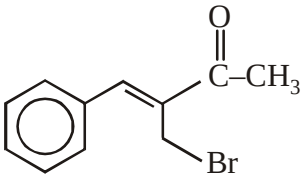
(C) 

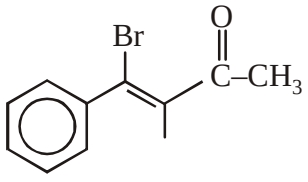
(D) 

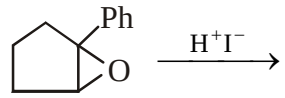
987. 

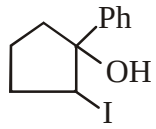
(A) 

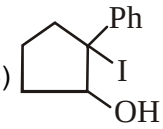
(B) 

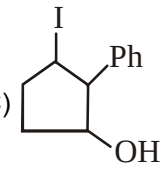
(C) 

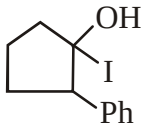
(D) 

988. 

(A) 

(B) 

(C) 

(D) 

SECTION IV: MATCH THE FOLLOWING

989. Match the following :

(I) Alcohol		(II) Water solubility in g/100 mol
(a)	Butan-1-ol	(P) 0.6
(a)	Pentan-1-ol	(Q) 2.7
(c)	Hexane-1-ol	(R) 9.1
(d)	2-Methyl propan-1-ol	(S) 10.0

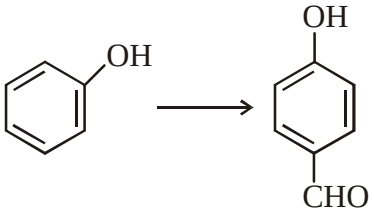
990. The polarimeter readings in an experiment to measure the rate of inversion of cane suger (1st order reaction) were as follows

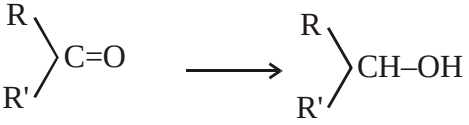
time (min)	:	0	30	∞
angle (degree)	:	30	20	– 15

Then match the following :

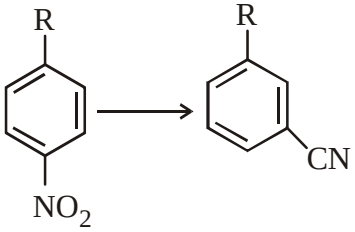
	Column I		**Column II**
(a)	The half life of the reaction	(i)	131 min.
(b)	The solution is optically inactive at	(ii)	7.5°
(c)	The equimolar mixture of the products	(iii)	82.7 min.
(d)	The angle at half time	(iv)	laevorotatory

991. For the following conversions mater with the correct reagent?

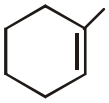
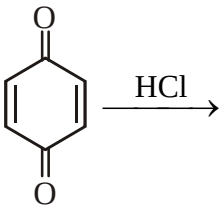
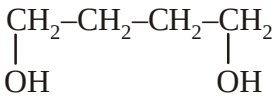
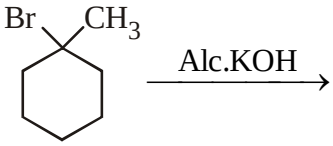
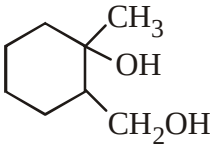
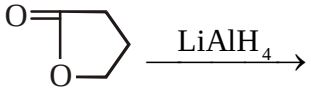
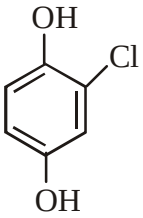
(a)  (P) $[CH_3)_2CHO]_3Al$

(b)  (Q) KCN/150°C

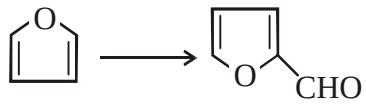
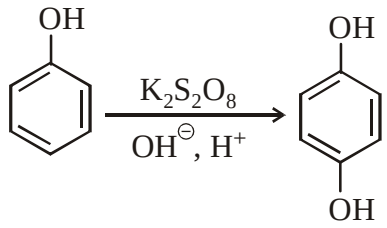
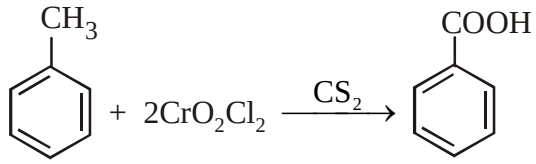
(c) $C_6H_5N_2Cl \longrightarrow C_6H_5CN$ (R) $CHCl_3$ + NaOH

(d)  (S) HCN/CuCN

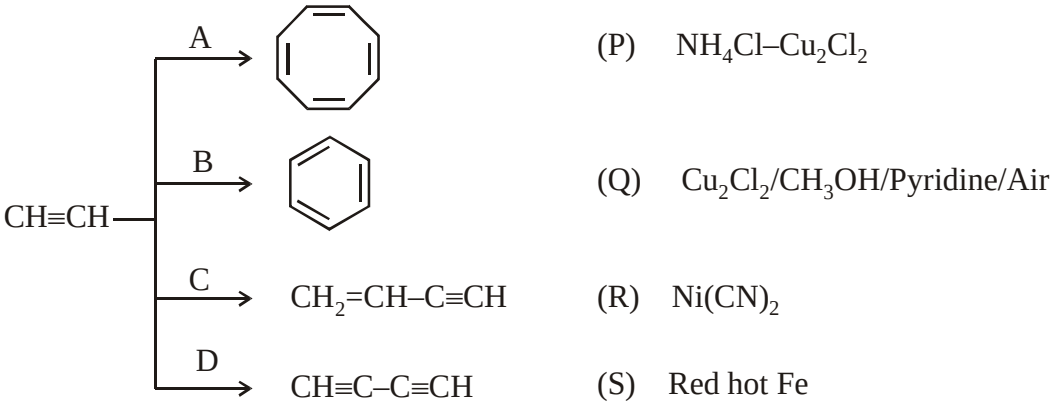
992. Match the following column

	Column I		Column II
(a)		(P)	
(b)		(Q)	
(c)		(R)	
(d)		(S)	

993. Match the following

Column I		Column II
(a)		(P) Elbs per sulphate oxidation reaction
(b)		(Q) Etards reaction
(c)		(R) Gattermann Aldehyde synthesis
(d)	$RCONH_2 \longrightarrow RNH_2$	(S) Hoffmann's Bromamide reaction

994. Identify A,B,C,D from P,Q,R,S



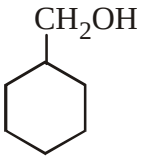
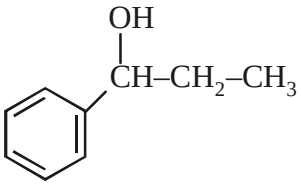
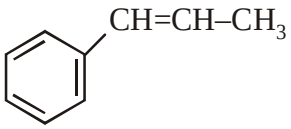
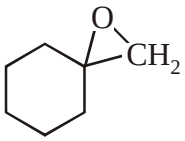
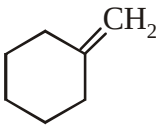
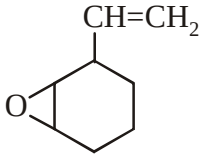
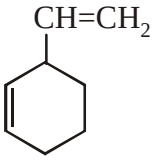
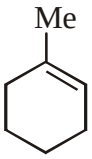
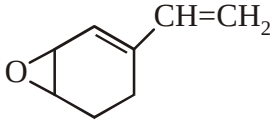
(P) $NH_4Cl–Cu_2Cl_2$

(Q) $Cu_2Cl_2/CH_3OH/Pyridine/Air$

(R) $Ni(CN)_2$

(S) Red hot Fe

995. Match the following question

Column I		Column II	
(a)		(P)	
(b)		(Q)	
(c)		(R)	
(d)		(S)	
		(T)	

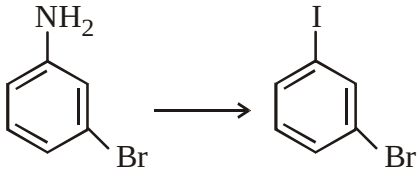
996. Match the following

Column I		Column II	
(a)	$CH_3–CH=CH–CH_2Cl + KOH\ (aq) \rightarrow$ major	(P)	But-2-en-1-ol
(b)	$CH_3–\underset{\displaystyle Cl}{\underset{\displaystyle \vert}{CH}}–CH=CH_2 + Ag_2O(Moist) \rightarrow$ major	(Q)	But-3-en-2-ol
(c)	$C_2H_5Cl + Ag–O–N=O \rightarrow$ major product	(R)	Ethyl nitrite
(d)	$C_2H_5Cl + K–O–N=O \rightarrow$ major product	(S)	Nitro ethane

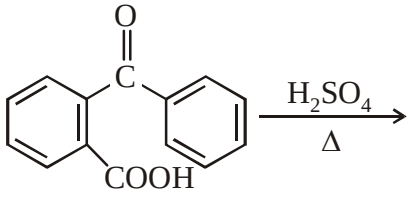
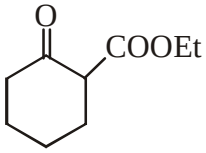
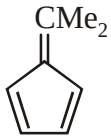
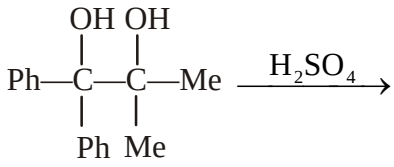
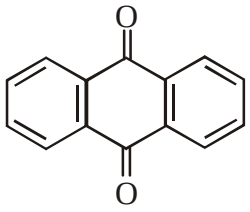
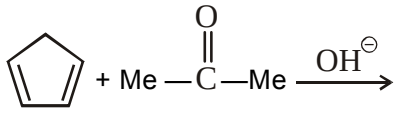
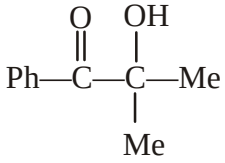
997. Match the following column

Column I		Column II	
(a)	$FeCl_3$	(P)	CH_3CHO, CH_3COCH_3
(b)	Fehling's solution	(Q)	$HCOOH, CH_3OH$
(c)	Aqueous solutions of KOH + dil. HNO_3 + $AgNO_3$	(R)	But-1-yne and But-2-yne
(d)	Aqueous KOH + 4-DNP	(S)	Benzene and cyclohexene

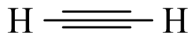
998. Match the following column

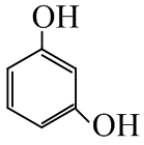
	Column I		Column II
(a)	m-dinitro benzene to m-nitro anilline	(P)	$NaBH_4$
(b)	$CH_3–CH=CH–CHO \rightarrow CH_3–CH=CH–COOH$	(Q)	Tollen's reagent
(c)	$C_6H_5–CH=CH–CHO \rightarrow C_6H_5CH=CH–CH_2OH$	(R)	$\xrightarrow[KI]{NaNO_2+HCl,0–5^oC}$
(d)		(S)	$(NH_4)_2S$

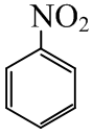
999. Match the following column

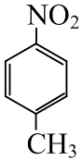
	Column I		Column II
(a)		(P)	
(b)	$EtOOC(CH_2)_5COOEt \xrightarrow{OEt^{\ominus}}$	(Q)	
(c)		(R)	
(d)		(S)	

1000. Match the four starting materials (P, Q, R, S) given List – I with reaction schemes (I, II, III, IV) provided in list II & select the correct answer using the code given below the lists.

(P) 

(Q) 

(R) 

(S) 

1. (i) $KMnO_4, HO^{\ominus}, heat$.
   (ii) $H^{\oplus}, H_2O$.
   (iii) $SOCl_2$.
   (iv) NH_3 .
   $\longrightarrow C_7H_6N_2O_3$
2. (i) Sn / HCl .
   (ii) CH_3COCl .
   (iii) $Conc.H_2SO_4$.
   (iv) HNO_3 .
   (v) $dil.H_2SO_4, Heat$.
   (vi) $HO^{\ominus}$.
   $\longrightarrow C_6H_6N_2O_2$
3. (i) Red hot iron, 873 K
   (ii) fuming $HNO_3, H_2SO_4, heat$.
   (iii) H_2S, NH_3 .
   (iv) $NaNO_2 \cdot H_2SO_4$.
   (v) Hydrolysis
   $\longrightarrow C_6H_5NO_3$
4. (i) conc. $H_2SO_4, 60°C$.
   (ii) conc. HNO_3 , conc. H_2SO_4 .
   (iii) dil. H_2SO_4 , heat
   $\longrightarrow C_6H_5NO_4$.

	P	Q	R	S
(A)	1	4	2	3
(B)	3	1	4	2
(C)	3	4	2	1
(D)	4	1	3	2

JEE ADVANCED REVISION PACKAGE - AnswerKey (CHEMISTRY)

Qs.	Ans.	Qs.	Ans.	Qs.	Ans.	Qs.	Ans.
1	D	51	BD	101	A	151	A
2	C	52	AB	102	D	152	D
3	B	53	ABC	103	A	153	A
4	B	54	ABC	104	C	154	A
5	A	55	ABCD	105	C	155	A
6	D	56	C	106	C	156	D
7	B	57	A	107	D	157	A-(R),B-(RS),C-(Q),D-(R)
8	D	58	A	108	D	158	500
9	D	59	C	109	A	159	70
10	B	60	D	110	B	160	3233
11	B	61	B	111	D	161	4800
12	A	62	A	112	B	162	300
13	D	63	D	113	A	163	5
14	D	64	B	114	C	164	81
15	C	65	A	115	B	165	9
16	C	66	D	116	A	166	2.62,3.38
17	A	67	D	117	C	167	5
18	A	68	D	118	C	168	35
19	C	69	A	119	A	169	4
20	D	70	B	120	B	170	7519
21	B	71	A	121	B	171	$9.8\times10^{14}\,Hz$
22	D	72	D	122	A	172	3
23	A	73	B	123	A	173	4247
24	D	74	A	124	C	174	32.24
25	C	75	B	125	C	175	1
26	B	76	A	126	A	176	390
27	ABC	77	B	127	A	177	120
28	AD	78	A	128	C	178	1033
29	ABCD	79	D	129	D	179	75
30	BCD	80	A	130	A	180	8349
31	ABC	81	B	131	C	181	(i)5,25,(ii)3.863
32	BC	82	D	132	B	182	$9.8\times10^{14}\,Hz$
33	BD	83	C	133	C	183	D
34	ABCD	84	C	134	A	184	B
35	ABC	85	C	135	D	185	B
36	CD	86	B	136	D	186	B
37	BCD	87	C	137	B	187	A
38	ABCD	88	C	138	D	188	A
39	BC	89	D	139	B	189	C
40	AD	90	B	140	A	190	D
41	CD	91	D	141	A-(Q),B-(S),C-(P),D-(R)	191	A
42	AB	92	C	142	A-(QR),B-(PS),C-(PS),D-(QR)	192	C
43	ABC	93	C	143	D	193	B
44	BC	94	C	144	C	194	B
45	AD	95	B	145	A	195	D
46	BC	96	A	146	A	196	B
47	AD	97	B	147	A-(Q),B-(P),C-(S),D-(R)	197	B
48	ABCD	98	C	148	A-(P,Q),B-(P,Q,R),C-(P,Q,R,S),D-(P,Q,R,S)	198	A
49	ABD	99	C	149	A	199	B
50	ACD	100	B	150	A-(p),B-(pq),C-(r),D-(s)	200	A

AnswerKey

Qs.	Ans.	Qs.	Ans.	Qs.	Ans.	Qs.	Ans.
201	C	251	BCD	301	B	351	D
202	A	252	AB	302	B	352	B
203	A	253	ABCD	303	D	353	B
204	D	254	AB	304	B	354	D
205	D	255	ACD	305	C	355	C
206	B	256	ABCD	306	C	356	B
207	D	257	AC	307	A	357	B
208	A	258	ABCD	308	B	358	A
209	B	259	BD	309	A	359	A
210	C	260	ABC	310	B	360	A
211	D	261	AC	311	A	361	C
212	C	262	ABC	312	B	362	B
213	A	263	AC	313	C	363	C
214	D	264	BCD	314	B	364	C
215	D	265	ABD	315	C	365	B
216	B	266	AC	316	B	366	A
217	B	267	ABCD	317	B	367	D
218	D	268	ABC	318	C	368	BD
219	C	269	AD	319		369	A
220	AB	270	AC	320	A	370	B
221	ABCD	271	AC	321	C	371	D
222	BC	272	AC	322	A	372	C
223	BC	273	AC	323	A	373	A
224	CD	274	ABC	324	B	374	A
225	ABC	275	AB	325	A	375	D
226	BC	276	A	326	D	376	(a)-(v),(b)-(vi),(c)-(iv),(d)-(ii),(e)-(vii),(f)-(iii),(g)-(i)
227	BCD	277	A	327	C	377	A
228	BCD	278	C	328	A	378	C
229	BC	279	D	329	B	379	A-(PQ),B-(R),C-(QT),D-(S),E-(U)
230	AD	280		330	C	380	A-(iv),B-(i),C-(ii),D-(iii)
231	BC	281	B	331	A	381	
232	ABC	282	D	332	B	382	A-(ii),B-(i),C-(iv),D-(iii)
233	BC	283	A	333	D	383	A
234	AC	284	B	334	C	384	B
235	ABC	285	A	335	D	385	A-(ii),B-(iii),C-(v),D-(vii),E-(vii)
236	AD	286	B	336	D	386	B
237	ABC	287	D	337	D	387	A
238	ABC	288	B	338	A	388	A-(ii),B-(ii),C-(v),D-(i),E-(iii),F-(iv)
239	CD	289	C	339	C	389	A-(v),B-(vi),C-(vii,viii),D-(iv),E-(ii),F-
240	AC	290	D	340	C	390	A-(ii),B-(i),C-(iii),D-(iii),E-(ii)
241	ABC	291	C	341	A	391	A-(ii),B-(i),C-(i),D-(ii),E-(iii)
242	AC	292	A	342	C	392	A-(v),B-(iv),C-(i),D-(iii),E-(ii)
243	AB	293	A	343	A	393	A-(ii),B-(i),C-(iv),D-(iii)
244	ABCD	294	B	344	C	394	A-(v),B-(iv),C-(ii),D-(iii),E-(i)
245	ABC	295	D	345	B	395	A
246	BC	296	C	346	D	396	D
247	ABCD	297	C	347	C	397	A
248	ACD	298	C	348	A	398	C
249	AC	299	D	349	A	399	C
250	AC	300	B	350	B	400	18.12

AnswerKey							
Qs.	**Ans.**	**Qs.**	**Ans.**	**Qs.**	**Ans.**	**Qs.**	**Ans.**
401	107	451	C	501	A	551	A-(QS),B-(R),C-(P),D-(QR)
402	685.3mL	452	B	502	C	552	495´10-4kJ/mol
403	15.50%	453	A	503	B	553	2
404	55	454	B	504	B	554	4
405	40	455	D	505	C	555	2
406	238	456	A	506	C	556	3.2
407	83.27	457	D	507	A	557	560
408	7957	458	C	508	B	558	5
409	265	459	C	509	B	559	72
410	86	460	A	510	B	560	7.6
411	(i)5,(ii)interstitial	461	AB	511	A	561	4.8
412	(a)V=5.95´103mL, (b)0.2118dpspermL	462	ABC	512	B	562	25
413	66.13mm,0.6563	463	ABD	513	B	563	70
414	25	464	ABCD	514	B	564	31kJmol-1
415	1/5,3/4,150mm	465	BC	515	C	565	1532.7kJ
416	2.165	466	ABC	516	A	566	5.2kJ
417	m=1,n=1	467	ACD	517	B	567	0
418	5	468	BCD	518	A	568	4.48
419	14	469	ACD	519	A	569	25
420	3	470	CD	520	A	570	0.768
421	8560	471	ABC	521	C	571	C
422	50	472	B	522	B	572	B
423	14	473	BD	523	C	573	C
424	561.8cm3	474	CD	524	C	574	A
425	A	475	ACD	525	B	575	B
426	D	476	ABD	526	D	576	A
427	D	477	ACD	527	A	577	D
428	D	478	B	528	C	578	A
429	D	479	AB	529	B	579	B
430	A	480	ABCD	530	A	580	A
431	D	481	ABC	531	BD	581	B
432	D	482	ABC	532	B	582	C
433	A	483	ABCD	533	C	583	C
434	D	484	ABD	534	A	584	C
435	B	485	ABD	535	A	585	B
436	D	486	CD	536	A-(PR),B-(QS),C-(PRS),D-(PR)	586	B
437	B	487	CD	537	A-(c),B-(d),C-(a),D-(b)	587	D
438	D	488	CD	538	A-(QR),B-(QRS),C-(SD),D-(PS)	588	NOTAVAILABLE
439	C	489	ABC	539	A-(QR),B-(PQRS),C-(PS),D-(PQR)	589	A
440	B	490	ACD	540	A-(RS),B-(R),C-(P),D-(Q)	590	B
441	C	491	ABD	541	A-(PQR),B-(PR),C-(PQ),D-(QS)	591	C
442	B	492	BC	542	A-(Q),B-(R),C-(P),D-(S)	592	B
443	C	493	AD	543	A-(P),B-(Q),C-(R),D-(S)	593	A
444	D	494	ABC	544	A-(PQ),B-(PR),C-(PS),D-(P)	594	C
445	B	495	AB	545	A-(Q),B-(R),C-(P),D-(S)	595	C
446	B	496	B	546	A-(R),B-(P),C-(S),D-(Q)	596	D
447	D	497	B	547	A-(C),B-(A),C-(B),D-(D)	597	C
448	C	498	C	548	A	598	C
449	B	499	C	549	C	599	A
450	A	500	D	550	A-(b),B-(c),C-(f),D-(e)	600	B

AnswerKey

Qs.	Ans.	Qs.	Ans.	Qs.	Ans.	Qs.	Ans.
601	A	651	ACD	701	B	751	D
602	B	652	ABCD	702	D	752	C
603	A	653	ABCD	703	B	753	D
604	B	654	AD	704	D	754	A
605	C	655	AB	705	B	755	D
606	A	656	ABC	706	D	756	D
607	C	657	ABC	707	A	757	D
608	B	658	ABC	708	A	758	
609	BCD	659	ABC	709	B	759	C
610	ACD	660	AB	710	A	760	B
611	AB	661	AC	711	B	761	A
612	ABD	662	AB	712	A	762	B
613	AB	663	C	713	A	763	B
614	BC	664	D	714	B	764	C
615	AB	665	B	715	B	765	A
616	ACD	666	C	716	A	766	A
617	BC	667	D	717	B	767	B
618	CD	668	C	718	A	768	D
619	BC	669	C	719	A	769	C
620	ABCD	670	B	720	C	770	A
621	ABCD	671		721	A	771	A
622	ABCD	672		722	A	772	B
623	BD	673	C	723	C	773	C
624	AD	674	A	724	B	774	D
625	ABC	675	B	725	B	775	A-(P),B-(QR),C-(S),D-(RS)
626	C	676	A	726	D	776	A-(PQR),B-(QRS),C-(PQ),D-
627	AC	677	A	727	D	777	A-(P),B-(R),C-(Q),D-(PQS)
628	AB	678	C	728	C	778	A-(PR),B-(PQ),C-(PS),D-(QS)
629	ABC	679	A	729	C	779	A-(QRS),B-(Q),C-(P),D-(RS)
630	BC	680	A	730	B	780	A-(PR),B-(Q),C-(R),D-(PS)
631		681	B	731	C	781	A-(d),B-(e),C-(a),D-(b),E-(c),F-
632		682	D	732	A	782	A-(c),B-(a),C-(d),D-(b)
633	ABD	683	A	733	C	783	A-(P),B-(PQS),C-(PQRS),D-(PS)
634	AC	684	A	734	C	784	A-(PQS),B-(Q),C-(PR),D-(P)
635	BC	685	C	735	A	785	A
636	ACD	686	B	736	B	786	A-(S),B-(P),C-(Q),D-(R)
637	AB	687	D	737	C	787	A-(S),B-(Q),C-(R),D-(P)
638	ACD	688	B	738	D	788	A-(d),B-(c),C-(a),D-(b)
639	CD	689	B	739	C	789	A-(d),B-(b),C-(a),D-(g),E-(c),F-
640	ABC	690	A	740	C	790	A-(v),B-(ii),C-(i,iv),D-(iii),E-
641	ACD	691	C	741	B	791	A-(iii,iv,v),B-(i),C-(v),D-(iii),E-
642	ABC	692	C	742	D	792	A-(b),B-(c),C-(f),D-(e)
643	D	693	B	743	B	793	A-(QRS),B-(RS),C-(PQ),D-(PQ)
644	NOTAVAILABLE	694	D	744	D	794	A-(Q),B-(R),C-(S),D-(P)
645	BC	695	C	745	A	795	A
646	AB	696	B	746	B	796	D
647	ABC	697	A	747	C	797	A-(R),B-(PR),C-(RS),D-(Q)
648	BCD	698	A	748	D	798	A-(T),B-(R),C-(Q),D-(S),E-(P),F-
649	ABD	699	A	749	A	799	A-(R),B-(P),C-(Q)
650	ABCD	700	A	750	A	800	A-(Q),B-(R),C-(T),D-(S)

AnswerKey

Qs.	Ans.	Qs.	Ans.	Qs.	Ans.	Qs.	Ans.
801	A-(R),B-(P),C-(Q),D-(S)	851	C	901	B	951	D
802	A-(v),B-(vii),C-(i),D-(vi),E-(ii),F-(viii),G-	852	D	902	A-(S),B-(R),C-(Q),D-(P)	952	CD
803	A-(PR),B-(PR),C-(Q),D-	853	D	903	A-(S),B-(R),C-(Q),D-(P)	953	ABCD
804	A-(pqr),B-(pqr),C-(p)	854	B	904		954	ACD
805	A-(s),B-(q),C-(p),D-(r)	855	D	905	A-(R),B-(Q),C-(Q),D-(P)	955	ABC
806	A-(s),B-(r),C-(q),D-(t),E-	856	A	906	A-(P),B-(Q),C-(R),D-(S)	956	ABC
807	A-(S),B-(Q),C-(R),D-(P)	857	D	907	A-(R),B-(P),C-(Q),D-(S)	957	BC
808	1	858	A	908	D	958	BD
809	6	859	B	909	B	959	ABC
810	28	860	A	910	D	960	ABC
811	2	861	A	911	C	961	ABC
812	6360	862	A	912	B	962	AB
813	9	863	B	913	C	963	ABC
814	5	864	CD	914	B	964	AB
815	36	865	AB	915	C	965	AB
816	0	866	C	916	A	966	CD
817	650	867	C	917	A	967	CD
818	5	868	D	918	A	968	AC
819	10	869	A	919	A	969	AD
820	2	870	A	920	D	970	ACD
821	0	871	BC	921	C	971	B
822	15	872	B	922	B	972	B
823	3	873	C	923	D	973	B
824	6	874	B	924	D	974	B
825	18	875	C	925	A	975	A
826	3	876	C	926	D	976	A
827	4	877	D	927	A	977	C
828	3	878	C	928	D	978	A
829	400	879	B	929	C	979	C
830	5	880	B	930	D	980	A
831	4	881	A	931	B	981	D
832	3	882	B	932	B	982	C
833	24	883	D	933	A	983	D
834	6	884	B	934	D	984	A
835	A	885	A	935	B	985	B
836	D	886	D	936	A	986	C
837	B	887	B	937	D	987	C
838	B	888	A	938	B	988	B
839	D	889	D	939	B	989	A-(R),B-(Q),C-(P),D-(S)
840	B	890	C	940	A	990	A-(R),B-(P),C-(S),D-(Q)
841	D	891	C	941	B	991	A-(R),B-(P),C-(S),D-(Q)
842	C	892	D	942	A	992	A-(R),B-(S),C-(P),D-(Q)
843	C	893	A	943	B	993	A-(R),B-(P),C-(Q),D-(S)
844	C	894	D	944	B	994	A-(Q),B-(S),C-(P),D-(Q)
845	B	895	A	945	C	995	A-(S),B-(P),C-(Q),D-(R)
846	A	896	C	946	D	996	A-(PQ),B-(Q),C-(S),D-(R)
847	A	897	D	947	C	997	A-(S),B-(R),C-(Q),D-(P)
848	A	898	C	948	D	998	A-(S),B-(Q),C-(P),D-(R)
849	A	899	C	949	B	999	A-(R),B-(P),C-(S),D-(Q)
850	C	900	A	950	B	1000	C