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Q-1 - JEE ADVANCED-PART TEST-8 (CHEMISTRY)-CHEMISTRY

CCl_4 and acetone form a non-ideal solution at room temperature in a copper container. For this process, the true statement(s) is (are) :

- (A) ΔG is positive
- (B) ΔS_{system} is positive
- (C) $\Delta S_{\text{surroundings}} < 0$
- (D) $\Delta H > 0$

Correct Option : B

SOLUTION

$\Delta G = -ve$, $\Delta S_{\text{system}} = +ve$ Always for solution formation

$\Delta S_{\text{surr}} < 0$ Heat absorbed by solution from surrounding

$\Delta H > 0$ For this solution as Cl_4 is non-polar but acetone is polar

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Q-2 - JEE ADVANCED-PART TEST-8 (CHEMISTRY)-CHEMISTRY

Which of the following is/are correct statement(s)

(A) Pure substance freezes at fixed pressure and temperature until all the liquid has frozen, Where as for a dilute solution the freezing points keeps dropping

(B) Boiling point of a pure liquid is always constant and is independent of pressure.

(C) The correct order of decreasing osmotic pressure of aqueous solution is

$0.1MNaCl > 0.1MCH_3COOH > 0.1M \text{ urea}$.

(D) The higher the molecular weight of the non electrolyte solute, the smaller the freezing point depression produced by one gram of that solute in 1000 g of solvent .

Correct Option : A

SOLUTION

N//A

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Q-3 - JEE ADVANCED-PART TEST-8 (CHEMISTRY)-CHEMISTRY

Which of the following is true regarding the following coordination compounds -

$CrCl_3 \cdot 6NH_3$, $PtCl_4 \cdot 4NH_3$, $Co(NO)_2$, $Co(NO_2)_3 \cdot 3KNO_2$, $PtCl_2$.

(A) $PtCl_2 \cdot 2NH_3$ shows stereoisomers.

(B) $PtCl_4 \cdot 4NH_3$ has maximum electrical conductance at infinite dilution.

(C) $Co(NO_2)_3 \cdot 3KNO_2$ is colourless

(D) $CrCl_3 \cdot 6NH_3$ has the maximum spin only magnetic moment.

Correct Option : A

SOLUTION

$PtCl_2 \cdot 2NH_3$ is $[Pt(NH_3)_2Cl_2]$

$CrCl_3 \cdot 6NH_3$ is $[Cr(NH_3)_6]Cl_3$

$PtCl_4 \cdot 4NH_3$ is $[Pt(NH_3)_4Cl_2]Cl_2$

$Ca(NO_2)_3 \cdot 3KNO_2$ is $K_3[Co(NO_2)_6]$

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Q-4 - JEE ADVANCED-PART TEST-8 (CHEMISTRY)-CHEMISTRY

Which of the following is/are correct about

Tetraamminedithiocyanato-S-cobalt (III) tris(oxalato) cobaltate (III)?

(A) Formula of the complex is



(B) It is a chelating complex and show linkage isomerism

(C) It shows optical isomerism

(D) It shows geometrical isomerism

Correct Option : B

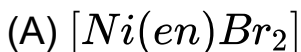
SOLUTION

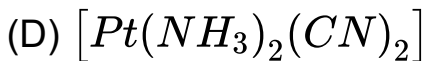
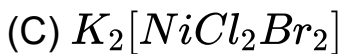
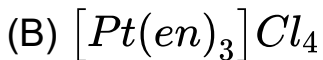
N//A

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Q-5 - JEE ADVANCED-PART TEST-8 (CHEMISTRY)-CHEMISTRY

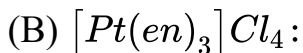
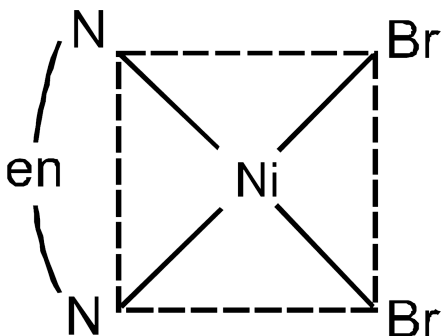
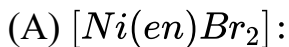
The compound(s) that exhibit(s) geometrical isomerism or optical isomerism or both is(are) :

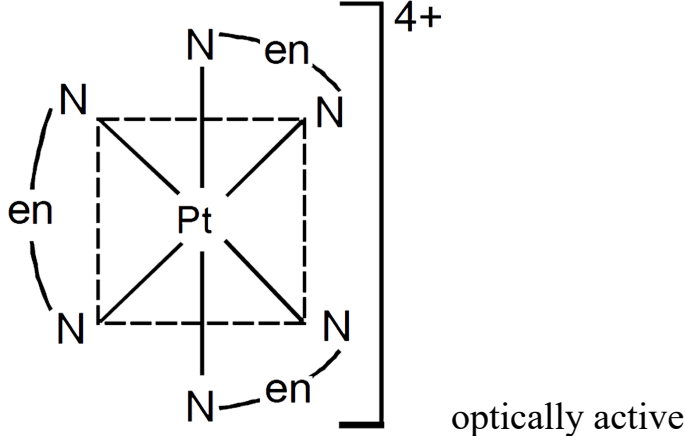




Correct Option : B

SOLUTION



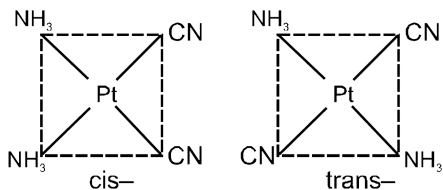


(C) $[NiCl_2Br_2]^{2-}$ = tetrahedral, no, *Gl*, no optical isomorphism

(D) $[Pt(NH_3)_2(CN)_2]$ \ Pt is in +2 oxidation state having $5d^8$

configuration. Hence the hybridisation on complex is dsp^2 and

geometry is square planar



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Q-6 - JEE ADVANCED-PART TEST-8 (CHEMISTRY)-CHEMISTRY

A d-block element forms octahedral complex but its spin magnetic moment remains same either in strong field or in weak field ligand.

Which of the following is /are correct?

- (A) Element always forms colourless compound.
 - (B) Number of electrons in t_{2g} orbitals are higher than in e_g orbitals.
 - (C) It can have either d^3 or d^8 configuration.
 - (D) It can have either d^7 or d^8 configuration.
-

Correct Option : B

SOLUTION

N//A

ATTEMPT FREE TEST ON DOUBTNUT 

Q-7 - JEE ADVANCED-PART TEST-8 (CHEMISTRY)-CHEMISTRY

In the crystal field of the complex $[Fe(Cl)(CN)_4(O_2)]^{4-}$ the electronic configuration of metal is found to be $t_{2g}^6 \cdot e_g^0$ then which of

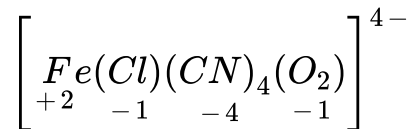
the following is true about this complexes ion:

- (A) It is a paramagnetic complex
 - (B) O-O bond length will be less than found in O_2 molecule
 - (C) Its IUPAC name will be chlorotetracyanosuperoxidoferrate (II) ion
 - (D) It is a diamagnetic complex
-

Correct Option : A

SOLUTION

The given complex is actually



hence $Fe(II)$ is t_{2g}^6, e_g^0 due to effect of strong ligands but it is

paramagnetic due to O_2^{-1} ligand

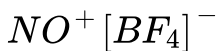
ATTEMPT FREE TEST ON DOUBTNUT 

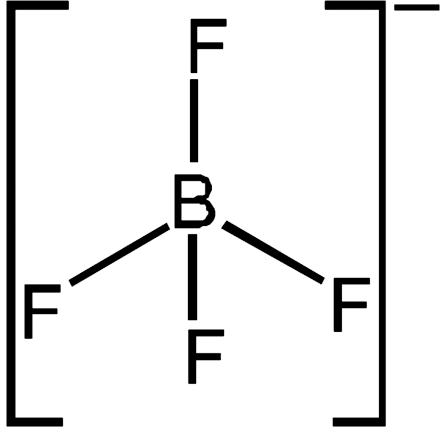
Select the correct statement(s) about the compound $NO[BF_4]$:

- (A) It has 5σ and 2π bond
 - (B) Nitrogen-oxygen bond length is higher than in nitric oxide (NO)
 - (C) It is a diamagnetic species
 - (D) B-F bond length in this compound is lower than in BF_3
-

Correct Option : A

SOLUTION





$B. O.$ of $NO^+ = 3.0$. *i. e.* one "sigma" bond and two π bonds

therefore NO of π bonds = 2

NO of σ bond = 5

$B. O.$ of $NO^+ = 3.0$

and BO of $NO = 2.5$

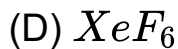
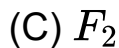
$\Rightarrow NO^+$ is diamagnetic and BF_4^- is also diamagnetic

$B - F$ bonds are longer in BF_4^- than in BF_3 due to absence of

$p\pi - p\pi$ back bonding in $[BF_4^-]$

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At least one element in its highest possible oxidation state is present in which of the following ?



Correct Option : B

SOLUTION

N//A

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Q-10 - JEE ADVANCED-PART TEST-8 (CHEMISTRY)-CHEMISTRY

Which of the following can produce B_2O_5 ?

(A) Heating borax with conc. H_2SO_4

(B) passing CO_2 through aq. $NaBO_2$

(C) combustion of diborane B_2H_6

(D) warming H_3BO_3 crystals till red hot.

Correct Option : A

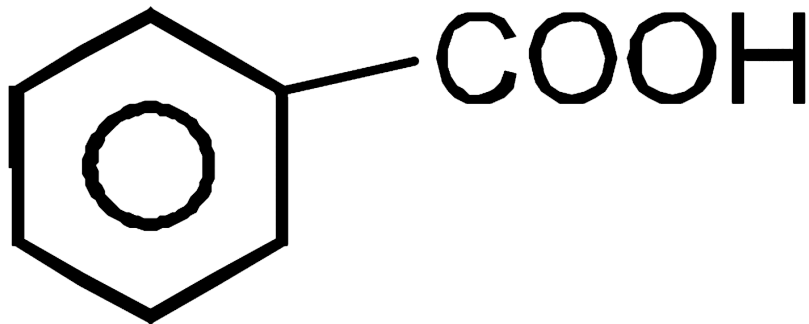
SOLUTION

N//A

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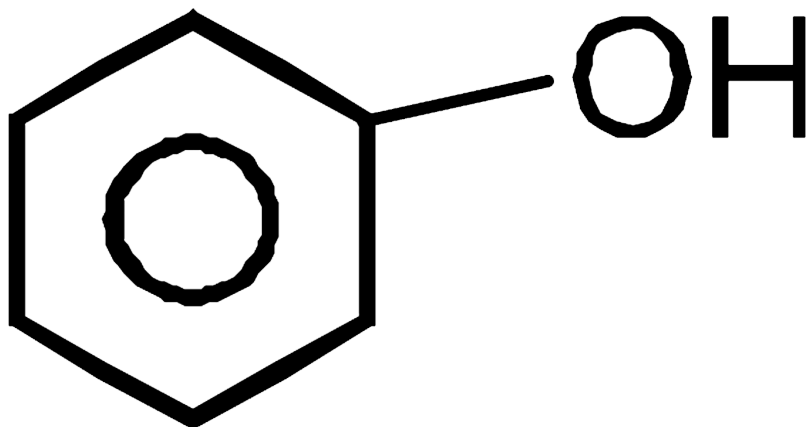
Q-11 - JEE ADVANCED-PART TEST-8 (CHEMISTRY)-CHEMISTRY

CO_2 can be liberated by



(A) adding

to $NaHCO_3$



(B) adding

to $NaHCO_3$

(C) Passing CO over red hot carbon

(D) burning diamond in air.

Correct Option : A

SOLUTION

N//A

ATTEMPT FREE TEST ON DOUBTNUT 

Q-12 - JEE ADVANCED-PART TEST-8 (CHEMISTRY)-CHEMISTRY

Which of the following statements are true?

- (A) ClO_2 in alkaline solution undergoes disproportionation
- (B) Ionisation enthalpy of molecular oxygen is very close to that of xenon.
- (C) Hydrolysis of XeF_6 may involve a redox reaction
- (D) Both P_4O_6 and P_4O_{10} contain 12 P-O bonds

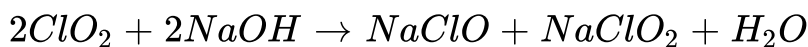
Correct Option : A

SOLUTION

ClO_2 is powerful oxidising agent also strong chlorinating agent its

bleaching power is almost 30 times stronger than Cl_2 in alkaline

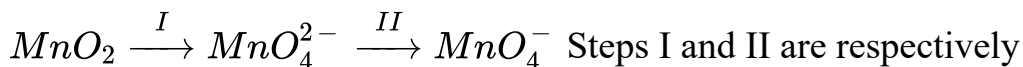
solution undergoes disproportionation



ATTEMPT FREE TEST ON DOUBTNUT 

Q-13 - JEE ADVANCED-PART TEST-8 (CHEMISTRY)-CHEMISTRY

Pyrolusite is MnO_2 used to prepare $KMnO_4$ steps are



(A) fuse with KOH / air and electrolytic oxidation.

(B) fuse with $KOH \xrightarrow{?} NO_3$ and electrolytic oxidation.

(C) fuse with conc. HNO_3 / air and electrolytic reduction.

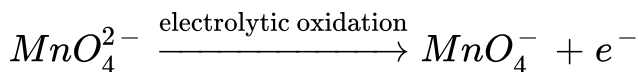
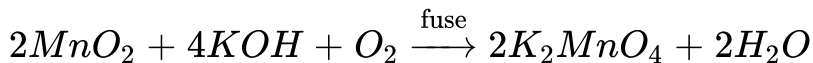
(D) dissolve in H_2O and oxidation.

Correct Option : A

SOLUTION

Fuse with KOH in presence of air or oxidising agents like

KNO_3 , $KClO_3$ etc



ATTEMPT FREE TEST ON DOUBTNUT 

Q-14 - JEE ADVANCED-PART TEST-8 (CHEMISTRY)-CHEMISTRY

A salt (X) is heated in a dry test tube. Reddish brown fumes (Y) are evolved which turn potassium dichromate paper green and starch iodide paper blue (Y) is found to be paramagnetic. Then :

- (A) X may be KNO_3
- (B) X may be $ZnBr_2$
- (C) X may be $Mg(NO_3)_2$
- (D) Y turns red litmus blue

Correct Option : C

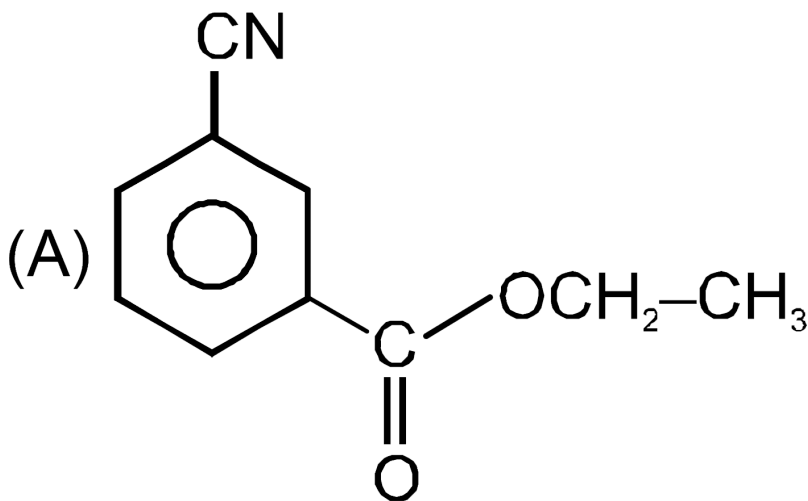
SOLUTION

Y is NO_2 . Hence (X) may be $Mg(NO_3)_2$

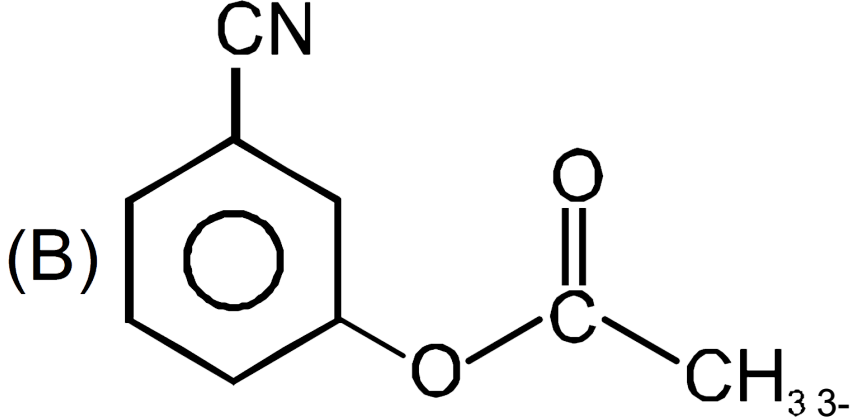
ATTEMPT FREE TEST ON DOUBTNUT 

Q-15 - JEE ADVANCED-PART TEST-8 (CHEMISTRY)-CHEMISTRY

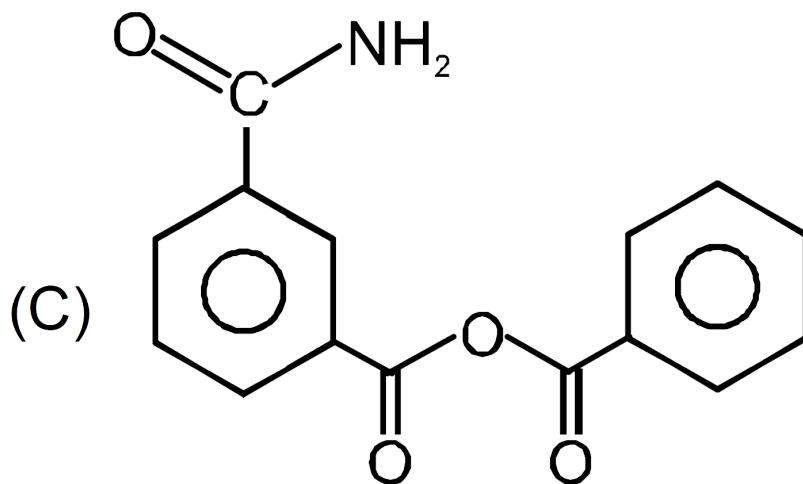
Which of the following molecules have been correctly named as per IUPAC nomenclature ?



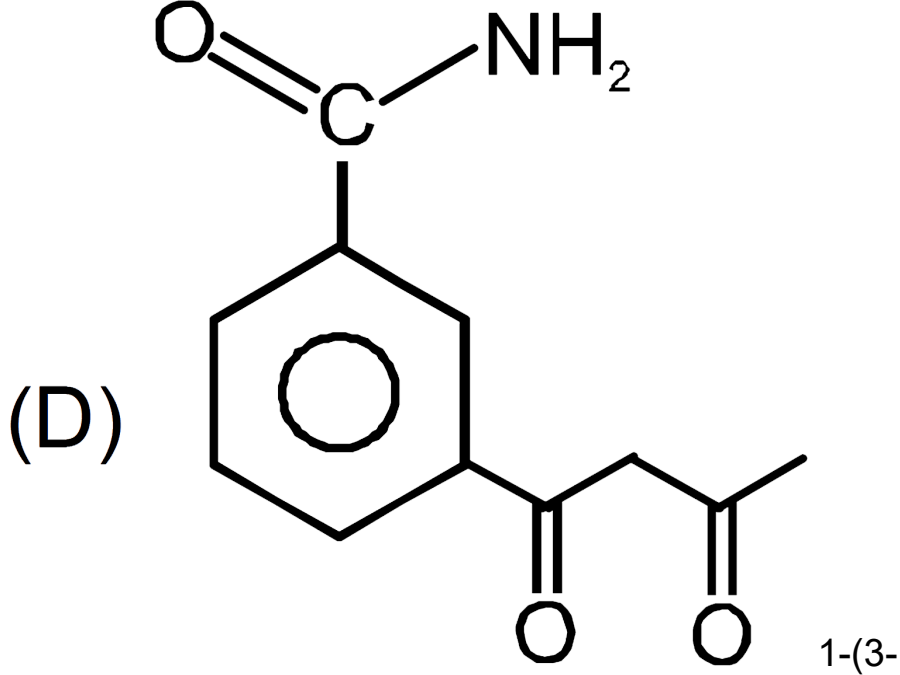
3- cyanobenzenecarboxylate



Cyanophenyl ethanoate



Benzenecarboxylic 3-carbamoylbenzenecarboxylic
anhydride



(D) carbamoylphenyl) pentane -1,3-dione

Correct Option : A

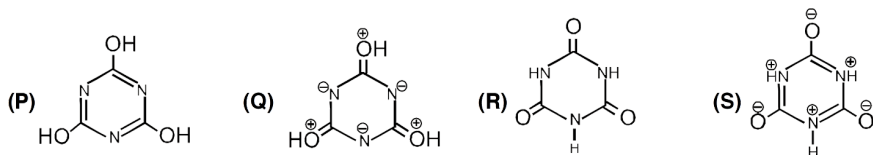
SOLUTION

N/A

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Q-16 - JEE ADVANCED-PART TEST-8 (CHEMISTRY)-CHEMISTRY

The correct statement(s) concerning the structures P,Q,R & S is/are :



(A) Q & S are tautomers.

(B) R & S are resonating structures.

(C) P & R are tautomers.

(D) P & Q are resonating structures.

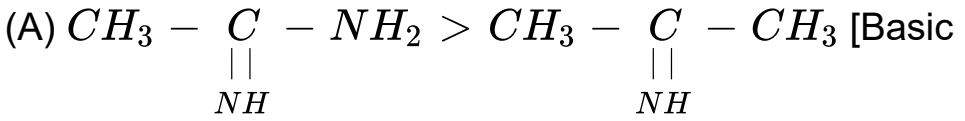
Correct Option : B

SOLUTION

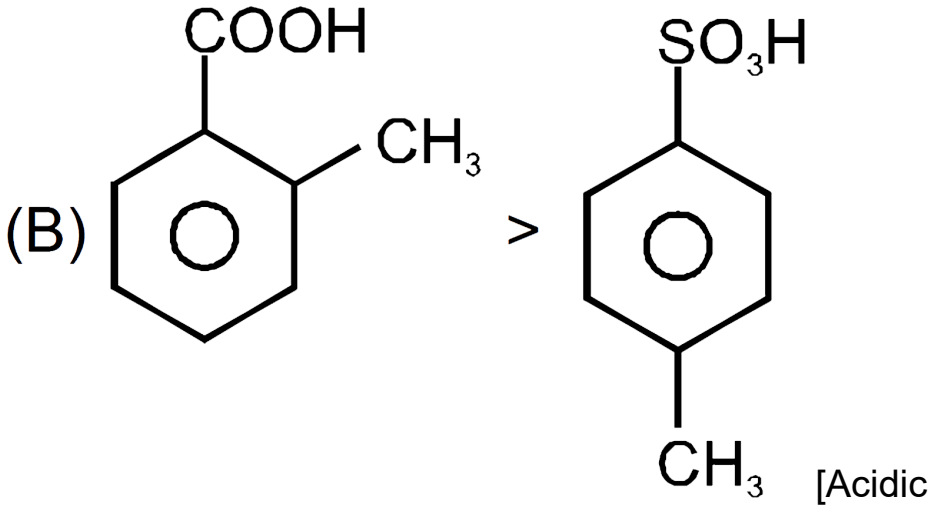
R and S. P and Q are resonating structures while P and R are tautomers structures

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Which of the following is correct?

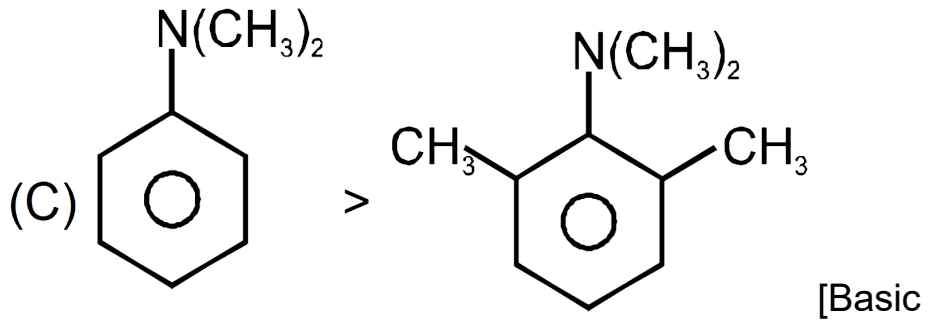


strength]



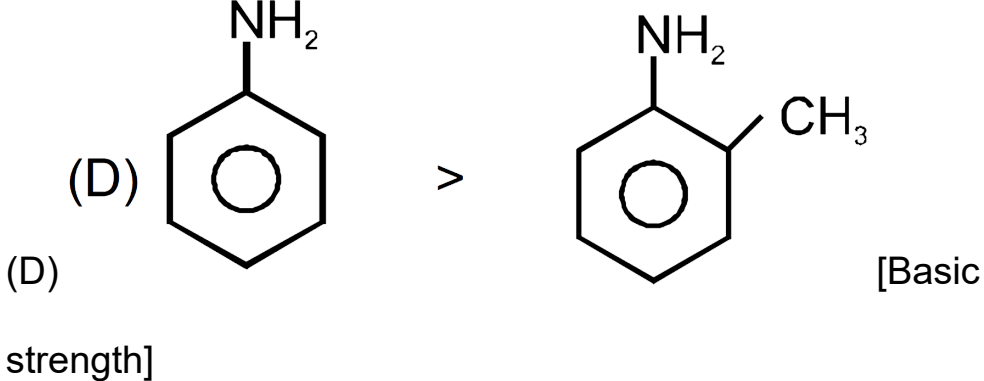
(B)

strength]



(C)

strength]



Correct Option : A

SOLUTION

N//A

ATTEMPT FREE TEST ON DOUBTNUT 

Q-18 - JEE ADVANCED-PART TEST-8 (CHEMISTRY)-CHEMISTRY

Which of the following is / are correctly matched

(A) Teflon - Vinyl fluoride

(B) Natural rubber - chloroprene

(C) Bakelite - Phenol + Formaldehyde

(D) Nylon-6,6 - Adipic acid + hexamethylene diamine

Correct Option : C

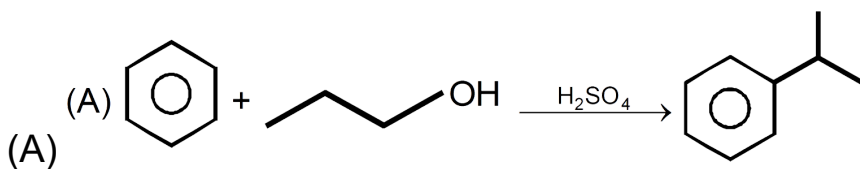
SOLUTION

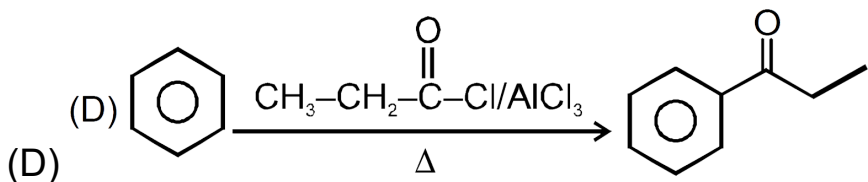
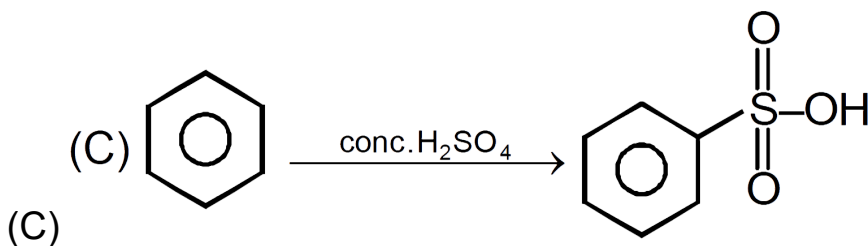
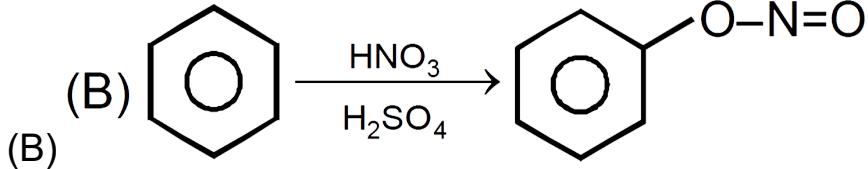
Teflon is polymer of tetrafluoro ethylene and Natural rubber is polymer of isoprene.

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Q-19 - JEE ADVANCED-PART TEST-8 (CHEMISTRY)-CHEMISTRY

In which of the following reactions correct major product has been mentioned ?



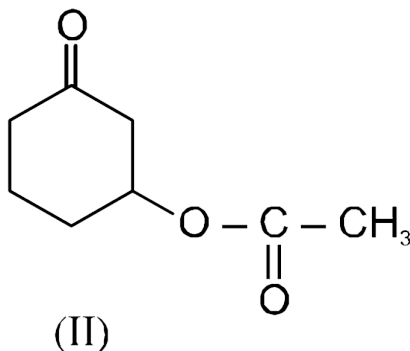
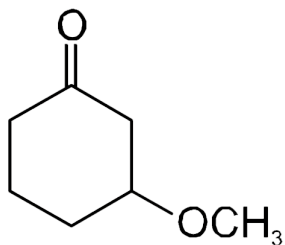


Correct Option : A

SOLUTION

N//A

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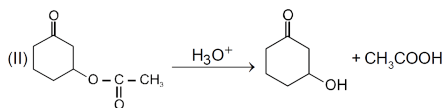
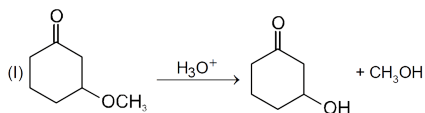


The correct statements about (I) and (II) are :

- (A) The acid catalysed hydrolysis of (I) and (II) yields one product identical
- (B) For Wolff Kishner reduction (I) is the better reactant.
- (C) (II) gives positive haloform reaction.
- (D) Reduction by LiAlH_4 forms a diol in both the cases

Correct Option : A

SOLUTION

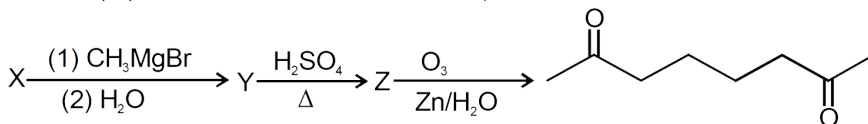
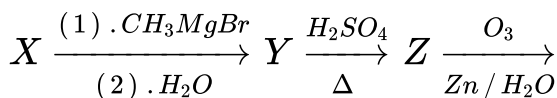


Woff kishner reduction is not used in presence of base sensitive group

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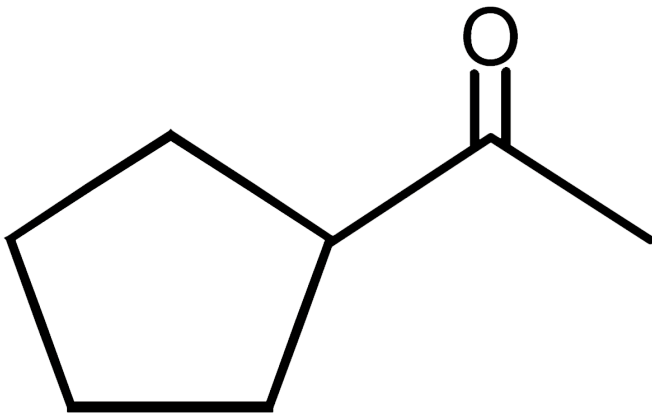
Q-21 - JEE ADVANCED-PART TEST-8 (CHEMISTRY)-CHEMISTRY

Consider the following sequence of reaction



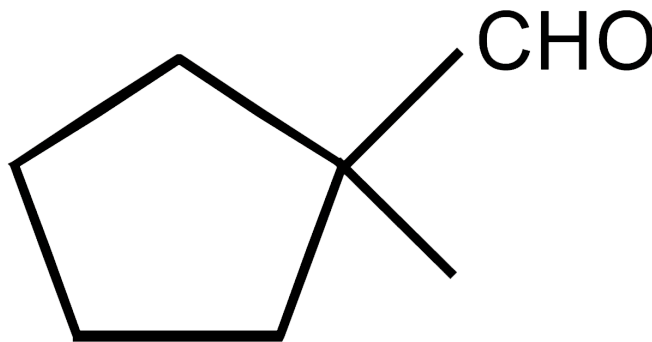
The compound X can be

(A)



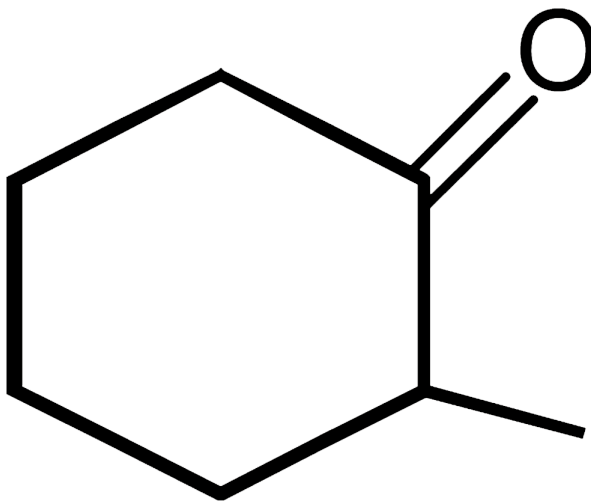
(A)

(B)



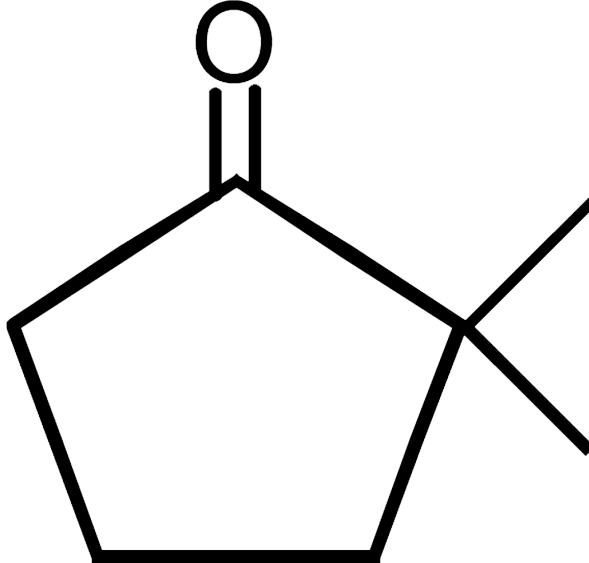
(B)

(C)



(C)

(D)



(D)

Correct Option : A

SOLUTION

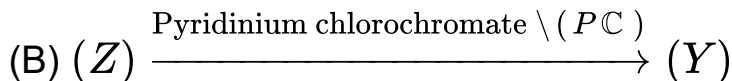
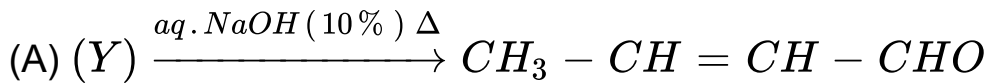
N/A

ATTEMPT FREE TEST ON DOUBTNUT 

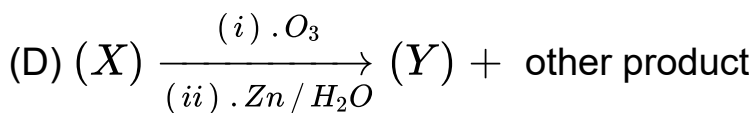
Q-22 - JEE ADVANCED-PART TEST-8 (CHEMISTRY)-CHEMISTRY

Compound (X) C_4H_8O decolourises Baeyers reagent. It undergoes hydrolysis on reaction with dil. H_2SO_4 and produces (Y) and (Z).

Both (Y) and (Z) give Iodoform test positive. Only (Y) gives Tollens test positive. Choose the correct statements.

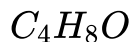


(C) Above 2 are correct

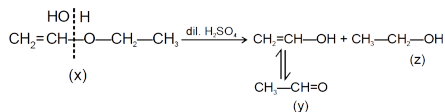


Correct Option : A

SOLUTION

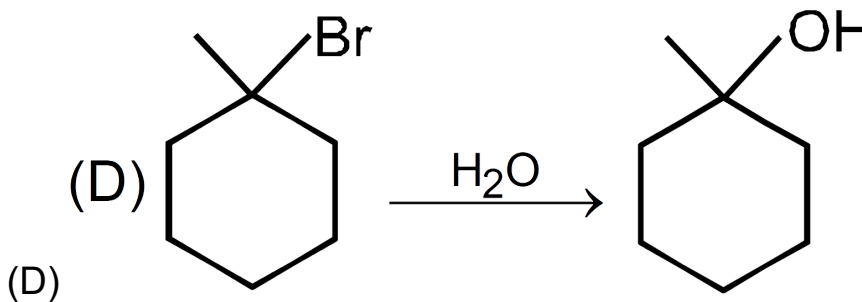
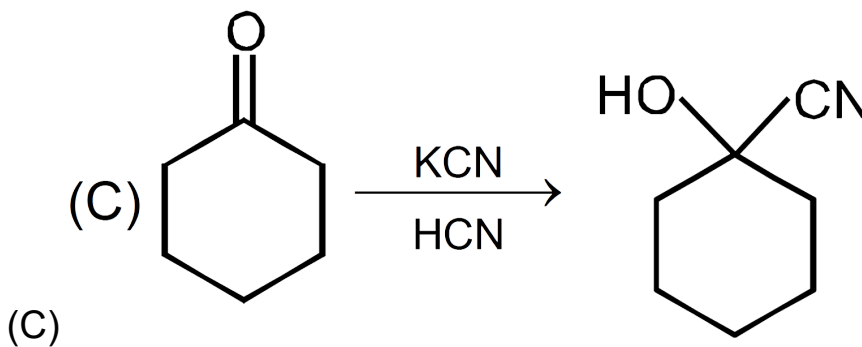
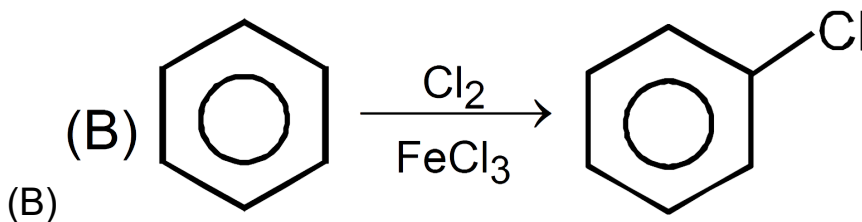
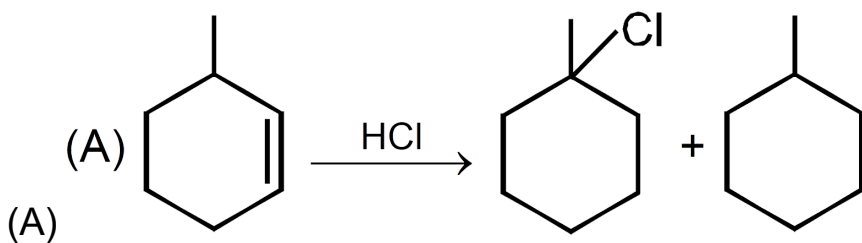


$$D.U. = 4 + 1 - 4 = 1$$



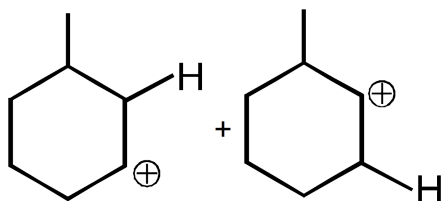
ATTEMPT FREE TEST ON DOUBTNUT 

Which of the following reactions involve a carbocation intermediate?



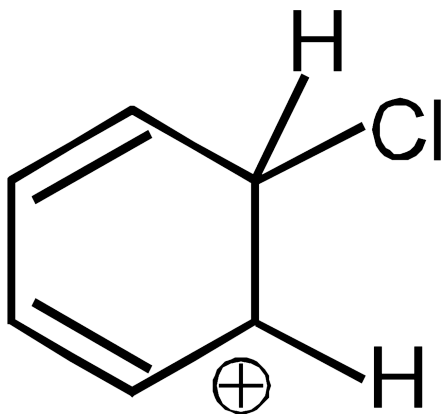
Correct Option : A

SOLUTION

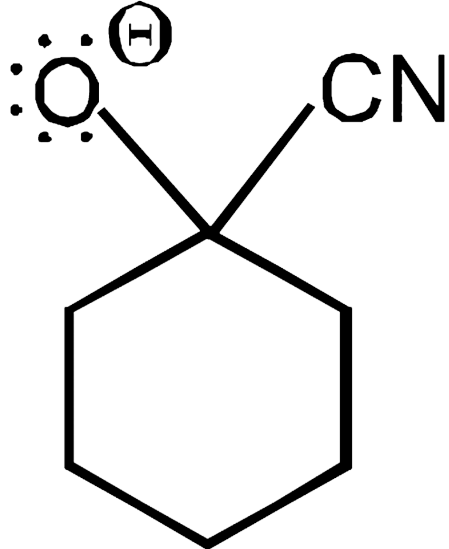


(A) is electrophilic addition

are formed in the first step

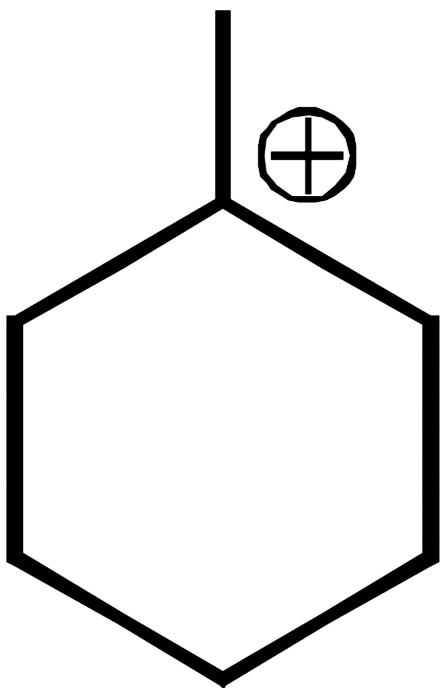


(B) is EAS'



(C)

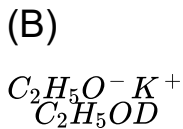
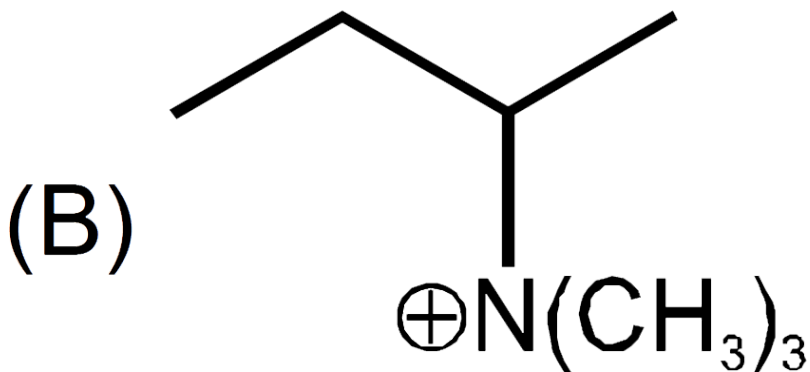
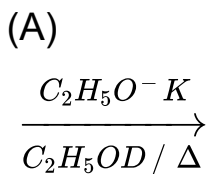
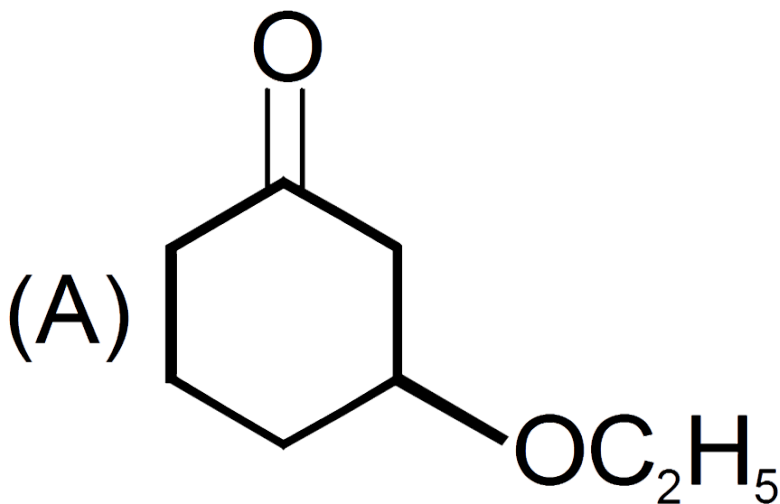
is formed (S_N2 Th)



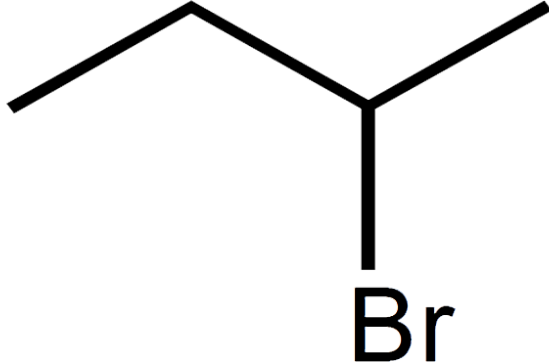
is formed (S_N1)

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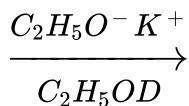
In which of the following reactions D-exchange will take place ?



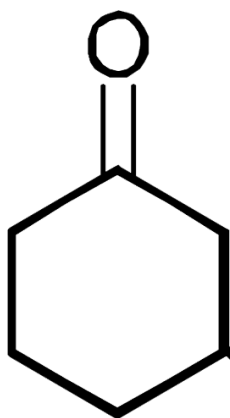
(C)



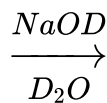
(C)



(D)



(D)

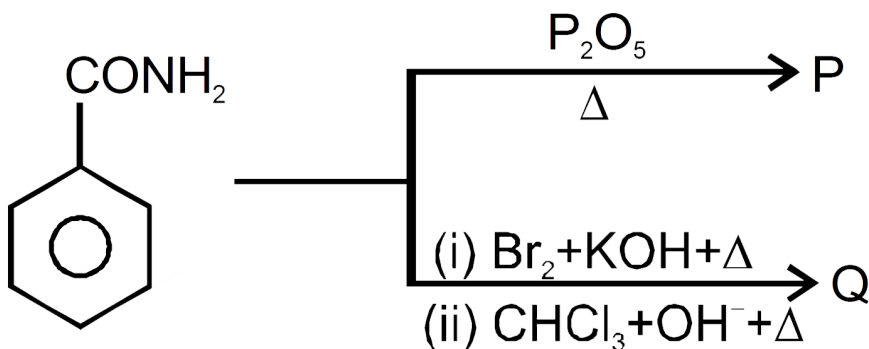


Correct Option : A

SOLUTION

N//A

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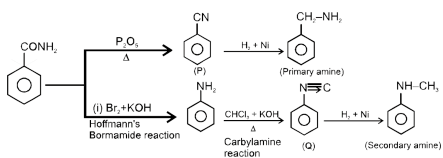


Which statements is are correct?

- (A) Reduced product of P and Q will be metamers to each other
- (B) By dry distillation of hydrolysed products of P with $Ca(OH)_2$, gives benzophenone
- (C) Hydrolysed product of Q, reacts with $NaNO_2 + HCl$ followed by reaction with phenol, gives orange red dye
- (D) Electrophile involved in the formation of Q is dichlorocarbene

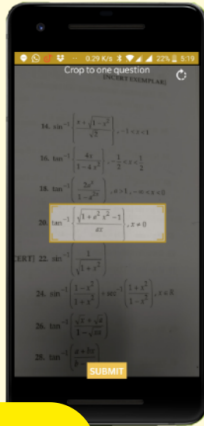
Correct Option : B

SOLUTION

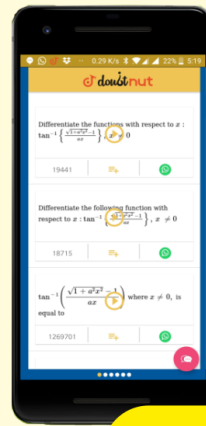


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