

Chemistry Section A

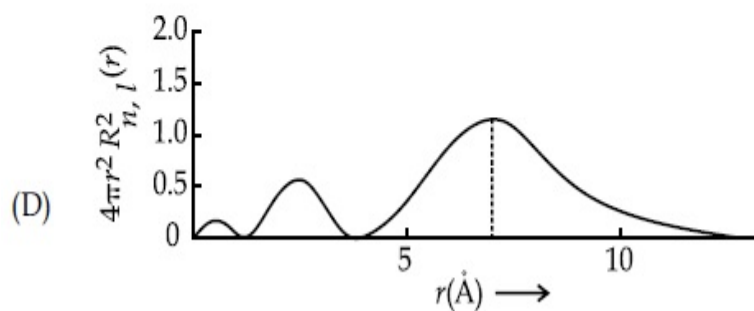
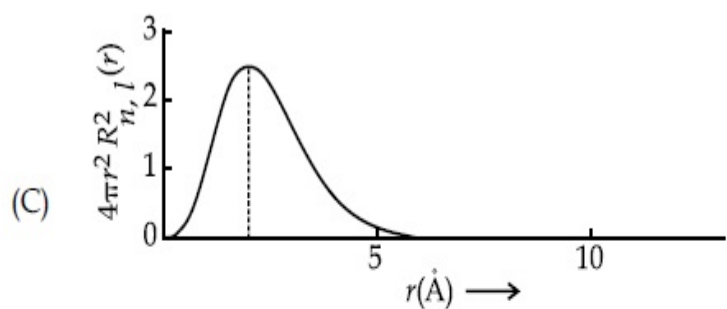
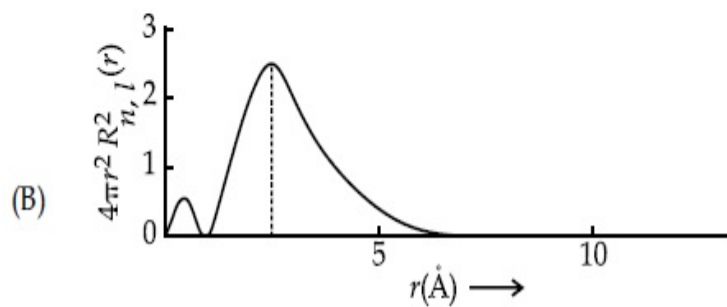
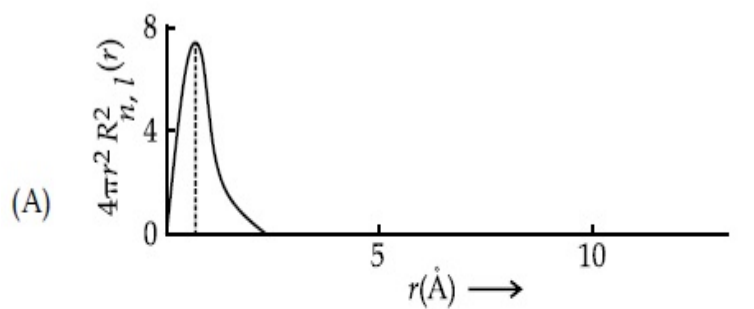
Section Id :	708191714
Section Number :	3
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	20
Number of Questions to be attempted :	20
Section Marks :	80
Mark As Answered Required? :	Yes
Sub-Section Number :	1
Sub-Section Id :	708191994
Question Shuffling Allowed :	Yes

Question Number : 31 Question Id : 70819117614 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The plots of radial distribution functions for various orbitals of hydrogen atom against 'r' are given below :



The correct plot for 3s orbital is :

Options :

70819157991. (A)

70819157992. (B)

70819157993. (C)

70819157994. (D)

Question Number : 32 Question Id : 70819117615 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

According to molecular orbital theory, the species among the following that does not exist is :

Options :

70819157995. O_2^{2-}

70819157996. He_2^-

70819157997. Be_2

70819157998. He_2^+

Question Number : 33 Question Id : 70819117616 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The solubility of AgCN in a buffer solution of pH=3 is x . The value of x is :
[Assume : No cyano complex is formed ; $K_{sp}(AgCN) = 2.2 \times 10^{-16}$ and $K_a(HCN) = 6.2 \times 10^{-10}$]

Options :

70819157999. 0.625×10^{-6}

70819158000. 1.6×10^{-6}

70819158001. 2.2×10^{-16}

70819158002. 1.9×10^{-5}

Question Number : 34 Question Id : 70819117617 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

In Freundlich adsorption isotherm at moderate pressure, the extent of adsorption $\left(\frac{x}{m}\right)$ is directly proportional to P^x . The value of x is :

Options :

70819158003. 1

70819158004. zero

70819158005. ∞

70819158006. $\frac{1}{n}$

Question Number : 35 Question Id : 70819117618 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Ellingham diagram is a graphical representation of :

Options :

70819158007. ΔG vs T

70819158008. ΔH vs T

70819158009. ΔG vs P

70819158010. $(\Delta G - T\Delta S)$ vs T

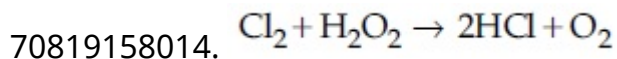
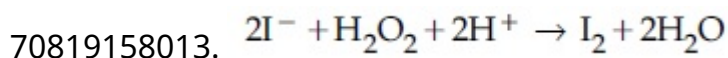
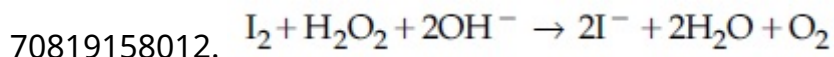
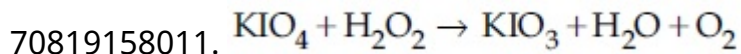
Question Number : 36 Question Id : 70819117619 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which of the following equation depicts the oxidizing nature of H_2O_2 ?

Options :



Question Number : 37 Question Id : 70819117620 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The correct statement about B_2H_6 is :

Options :

70819158015. All B–H–B angles are of 120° .

70819158016. The two B–H–B bonds are not of same length.

70819158017. Terminal B–H bonds have less *p*-character when compared to bridging bonds.

70819158018. Its fragment, BH_3 , behaves as a Lewis base.

Question Number : 38 Question Id : 70819117621 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Given below are two statements :

Statement I : CeO_2 can be used for oxidation of aldehydes and ketones.

Statement II : Aqueous solution of EuSO_4 is a strong reducing agent.

In the light of the above statements, choose the correct answer from the options given below :

Options :

70819158019. Both Statement I and Statement II are true

70819158020. Both Statement I and Statement II are false

70819158021. Statement I is true but Statement II is false

70819158022. Statement I is false but Statement II is true

Question Number : 39 Question Id : 70819117622 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

In which of the following pairs, the outer most electronic configuration will be the same ?

Options :

70819158023. V^{2+} and Cr^+

70819158024. Cr^+ and Mn^{2+}

70819158025. Ni^{2+} and Cu^+

70819158026. Fe^{2+} and Co^+

Question Number : 40 Question Id : 70819117623 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The hybridization and magnetic nature of $[\text{Mn}(\text{CN})_6]^{4-}$ and $[\text{Fe}(\text{CN})_6]^{3-}$, respectively are :

Options :

70819158027. d^2sp^3 and paramagnetic

70819158028. sp^3d^2 and diamagnetic

70819158029. d^2sp^3 and diamagnetic

70819158030. sp^3d^2 and paramagnetic

Question Number : 41 Question Id : 70819117624 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Given below are two statements :

Statement I : An allotrope of oxygen is an important intermediate in the formation of reducing smog.

Statement II : Gases such as oxides of nitrogen and sulphur present in troposphere contribute to the formation of photochemical smog.

In the light of the above statements, choose the correct answer from the options given below :

Options :

70819158031. Both Statement I and Statement II are true

70819158032. Both Statement I and Statement II are false

70819158033. Statement I is true but Statement II is false

70819158034. Statement I is false but Statement II is true

Question Number : 42 Question Id : 70819117625 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Complete combustion of 1.80 g of an oxygen containing compound ($C_xH_yO_z$) gave 2.64 g of CO_2 and 1.08 g of H_2O . The percentage of oxygen in the organic compound is :

Options :

70819158035. 50.33

70819158036. 53.33

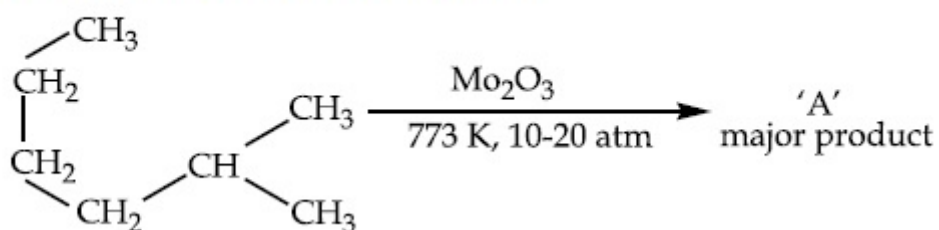
70819158037. 63.53

70819158038. 51.63

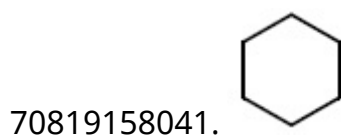
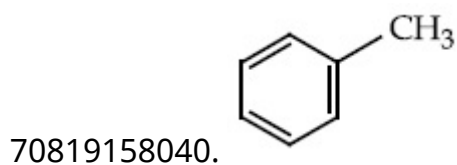
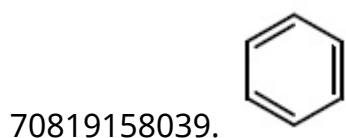
Question Number : 43 Question Id : 70819117626 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

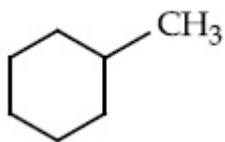
Identify A in the given chemical reaction.



Options :



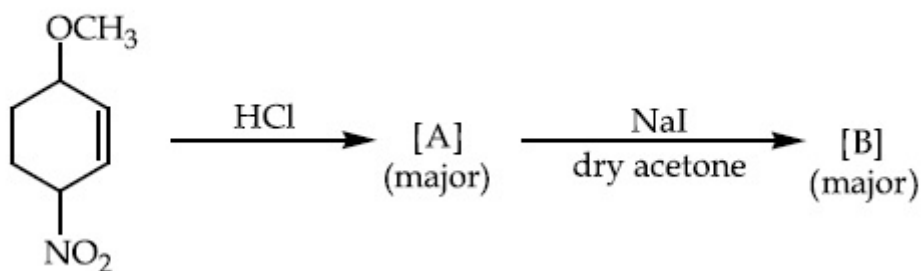
70819158042.



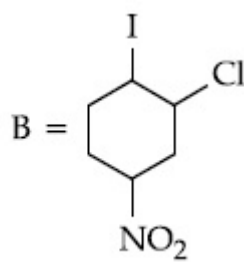
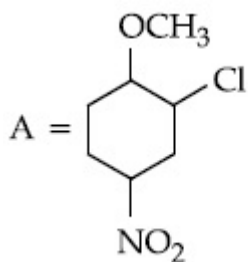
Question Number : 44 Question Id : 70819117627 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

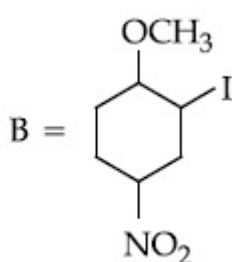
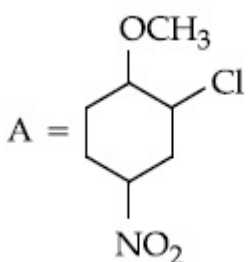
Identify A and B in the chemical reaction.



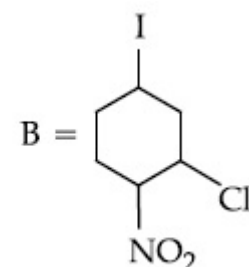
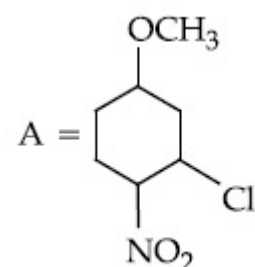
Options :



70819158043.

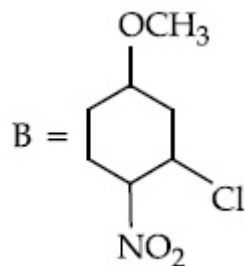
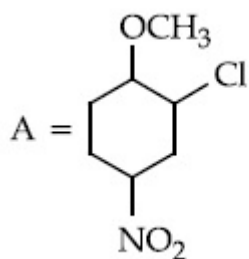


70819158044.



70819158045.

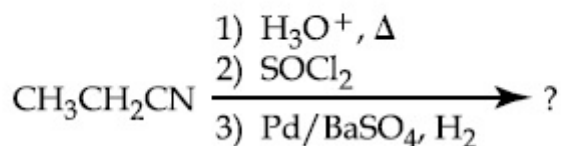
70819158046.



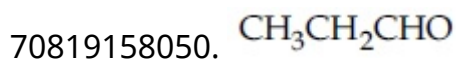
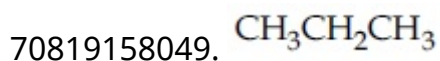
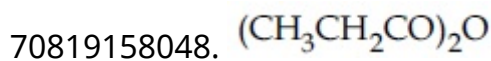
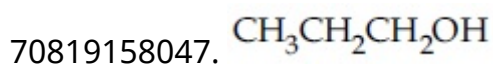
Question Number : 45 Question Id : 70819117628 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The major product of the following chemical reaction is :



Options :

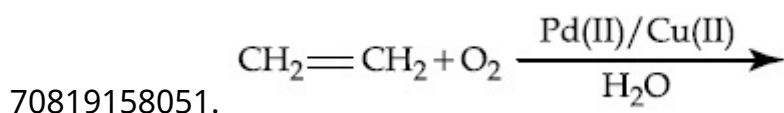


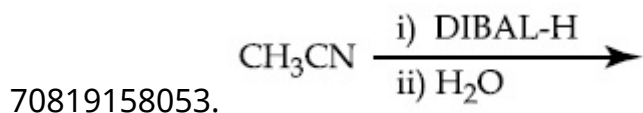
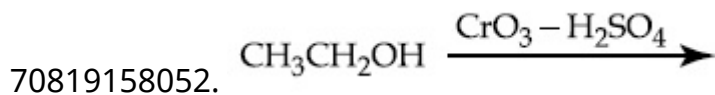
Question Number : 46 Question Id : 70819117629 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which one of the following reactions will not form acetaldehyde ?

Options :

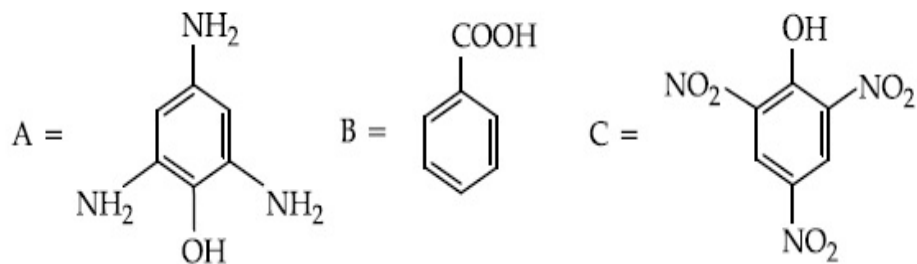




**Question Number : 47 Question Id : 70819117630 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No**

Correct Marks : 4 Wrong Marks : 1

Compound(s) which will liberate carbon dioxide with sodium bicarbonate solution is/are :



Options :

70819158055. A and B only

70819158056. C only

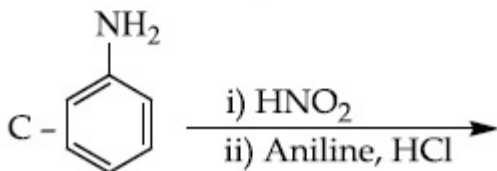
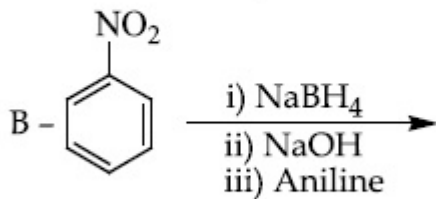
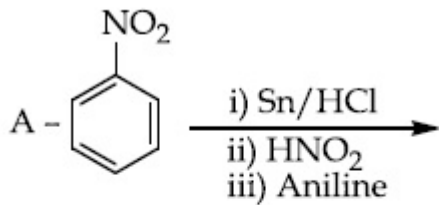
70819158057. B and C only

70819158058. B only

**Question Number : 48 Question Id : 70819117631 Question Type : MCQ Option Shuffling : Yes
Is Question Mandatory : No**

Correct Marks : 4 Wrong Marks : 1

Which of the following reaction/s will not give *p*-aminoazobenzene ?



Options :

70819158059. A only

70819158060. C only

70819158061. B only

70819158062. A and B

Question Number : 49 Question Id : 70819117632 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which statement is correct ?

Options :

70819158063. Buna-N is a natural polymer.

70819158064. Buna-S is a synthetic and linear thermosetting polymer.

70819158065. Neoprene is an addition copolymer used in plastic bucket ma

70819158066. Synthesis of Buna-S needs nascent oxygen.

Question Number : 50 Question Id : 70819117633 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which of the glycosidic linkage between galactose and glucose is present in lactose ?

Options :

70819158067. C-1 of galactose and C-4 of glucose

70819158068. C-1 of galactose and C-6 of glucose

70819158069. C-1 of glucose and C-4 of galactose

70819158070. C-1 of glucose and C-6 of galactose

Chemistry Section B

Section Id :	708191715
Section Number :	4
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	10
Number of Questions to be attempted :	5
Section Marks :	20
Mark As Answered Required? :	Yes
Sub-Section Number :	1
Sub-Section Id :	708191995

Question Shuffling Allowed :

Yes

Question Number : 51 Question Id : 70819117634 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

0.4 g mixture of NaOH, Na₂CO₃ and some inert impurities was first titrated with $\frac{N}{10}$ HCl using phenolphthalein as an indicator, 17.5 mL of HCl was required at the end point. After this methyl orange was added and titrated. 1.5 mL of same HCl was required for the next end point. The weight percentage of Na₂CO₃ in the mixture is _____. (Rounded-off to the nearest integer)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 52 Question Id : 70819117635 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A car tyre is filled with nitrogen gas at 35 psi at 27°C. It will burst if pressure exceeds 40 psi. The temperature in °C at which the car tyre will burst is _____. (Rounded-off to the nearest integer)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

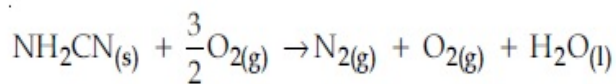
Possible Answers :

5 to 5.001

Question Number : 53 Question Id : 70819117636 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The reaction of cyanamide, $\text{NH}_2\text{CN}_{(s)}$ with oxygen was run in a bomb calorimeter and ΔU was found to be $-742.24 \text{ kJ mol}^{-1}$. The magnitude of ΔH_{298} for the reaction



is _____ kJ. (Rounded off to the nearest integer)

[Assume ideal gases and $R = 8.314 \text{ J mol}^{-1} \text{ K}^{-1}$]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 54 **Question Id :** 70819117637 **Question Type :** SA

Correct Marks : 4 **Wrong Marks :** 0

1 molal aqueous solution of an electrolyte A_2B_3 is 60% ionised. The boiling point of the solution at 1 atm is _____ K. (Rounded-off to the nearest integer)

[Given K_b for $(\text{H}_2\text{O}) = 0.52 \text{ K kg mol}^{-1}$]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 55 **Question Id :** 70819117638 **Question Type :** SA

Correct Marks : 4 **Wrong Marks :** 0

In basic medium CrO_4^{2-} oxidises $\text{S}_2\text{O}_3^{2-}$ to form SO_4^{2-} and itself changes into $\text{Cr}(\text{OH})_4^-$.

The volume of $0.154 \text{ M CrO}_4^{2-}$ required to react with 40 mL of $0.25 \text{ M S}_2\text{O}_3^{2-}$ is _____ mL. (Rounded-off to the nearest integer)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

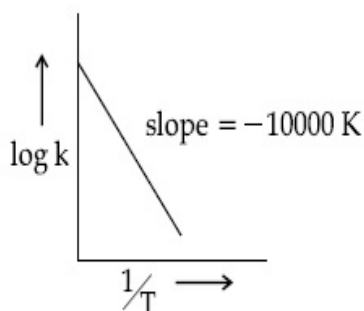
Possible Answers :

5 to 5.001

Question Number : 56 **Question Id :** 70819117639 **Question Type :** SA

Correct Marks : 4 **Wrong Marks :** 0

For the reaction, $aA + bB \rightarrow cC + dD$, the plot of $\log k$ vs $\frac{1}{T}$ is given below :



The temperature at which the rate constant of the reaction is 10^{-4} s^{-1} is _____ K.
(Rounded-off to the nearest integer)

[Given : The rate constant of the reaction is 10^{-5} s^{-1} at 500 K.]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 57 **Question Id :** 70819117640 **Question Type :** SA

Correct Marks : 4 **Wrong Marks :** 0

The ionization enthalpy of Na^+ formation from $\text{Na}_{(g)}$ is $495.8 \text{ kJ mol}^{-1}$, while the electron gain enthalpy of Br is $-325.0 \text{ kJ mol}^{-1}$. Given the lattice enthalpy of NaBr is $-728.4 \text{ kJ mol}^{-1}$. The energy for the formation of NaBr ionic solid is $(-)______ \times 10^{-1} \text{ kJ mol}^{-1}$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 58 Question Id : 70819117641 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Among the following, the number of halide(s) which is/are inert to hydrolysis is _____.

(A) BF_3 (B) SiCl_4 (C) PCl_5 (D) SF_6

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

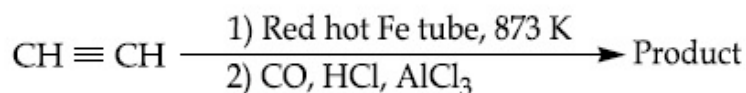
Possible Answers :

5 to 5.001

Question Number : 59 Question Id : 70819117642 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Consider the following chemical reaction.



The number of sp^2 hybridized carbon atom(s) present in the product is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 60 **Question Id :** 70819117643 **Question Type :** SA

Correct Marks : 4 **Wrong Marks :** 0

Using the provided information in the following paper chromatogram :

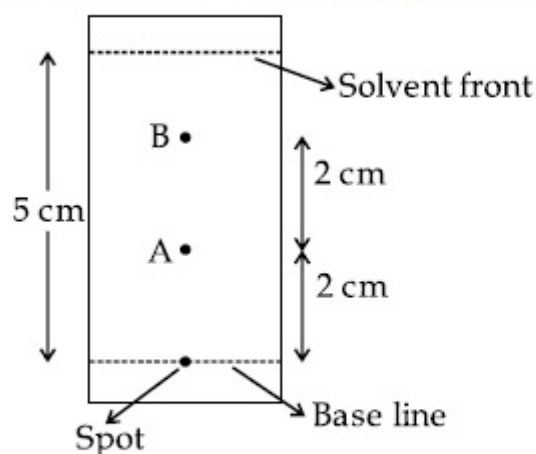


Fig : Paper chromatography for compounds A and B.

the calculated R_f value of A _____ $\times 10^{-1}$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001