Chemistry Section A

Section Id :	8643519
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 :	8643519
Question Shuffling Allowed :	Yes

Question Number : 31 Question Id : 864351121 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Given below are two statements : one is labelled as **Assertion A** and the other is labelled as **Reason R** :

Assertion A : The H – O – H bond angle in water molecule is 104.5°.

Reason R : The lone pair - lone pair repulsion of electrons is higher than the bond pair - bond pair repulsion.

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

Options :

864351361. Both **A** and **R** are true, and **R** is the correct explanation of **A**

864351362. Both **A** and **R** are true, but **R** is not the correct explanation of **A**

864351363. **A** is true but **R** is false

864351364. **A** is false but **R** is true

Question Number : 32 Question Id : 864351122 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Match **List - I** with **List - II** :

	List - I		**List - II**
	Industrial process		**Application**
(a)	Haber's process	(i)	HNO_3 synthesis
(b)	Ostwald's process	(ii)	Aluminium extraction
(c)	Contact process	(iii)	NH_3 synthesis
(d)	Hall-Heroult process	(iv)	H_2SO_4 synthesis

Choose the **correct** answer from the options given below :

Options :

864351365. (a)-(iv), (b)-(i), (c)-(ii), (d)-(iii)

864351366. (a)-(iii), (b)-(i), (c)-(iv), (d)-(ii)

864351367. (a)-(ii), (b)-(iii), (c)-(iv), (d)-(i)

864351368. (a)-(iii), (b)-(iv), (c)-(i), (d)-(ii)

Question Number : 33 Question Id : 864351123 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A group 15 element, which is a metal and forms a hydride with strongest reducing power among group 15 hydrides. The element is :

Options :

864351369. Bi

864351370. P

864351371. As

864351372. Sb

Question Number : 34 Question Id : 864351124 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The process that involves the removal of sulphur from the ores is :

Options :

864351373. Refining

864351374. Roasting

864351375. Smelting

864351376. Leaching

Question Number : 35 Question Id : 864351125 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Given below are two statements :

Statement I : H_2O_2 can act as both oxidising and reducing agent in basic medium.

Statement II : In the hydrogen economy, the energy is transmitted in the form of dihydrogen.

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

Options :

864351377. Both statement I and statement II are true

864351378. Both statement I and statement II are false

864351379. Statement I is true but statement II is false

864351380. Statement I is false but statement II is true

Question Number : 36 Question Id : 864351126 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Given below are two statements :

Statement I : Both $CaCl_2 \cdot 6H_2O$ and $MgCl_2 \cdot 8H_2O$ undergo dehydration on heating.

Statement II : BeO is amphoteric whereas the oxides of other elements in the same group are acidic.

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

Options :

864351381. Both statement I and statement II are true

864351382. Both statement I and statement II are false

864351383. Statement I is true but statement II is false

864351384. Statement I is false but statement II is true

Question Number : 37 Question Id : 864351127 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Match List - I with List - II :

	List - I Name of oxo acid		List - II Oxidation state of 'P'
(a)	Hypophosphorous acid	(i)	+5
(b)	Orthophosphoric acid	(ii)	+4
(c)	Hypophosphoric acid	(iii)	+3
(d)	Orthophosphorous acid	(iv)	+2
		(v)	+1

Choose the **correct** answer from the options given below :

Options :

864351385. (a)-(v), (b)-(iv), (c)-(ii), (d)-(iii)

864351386. (a)-(iv), (b)-(i), (c)-(ii), (d)-(iii)

864351387. (a)-(iv), (b)-(v), (c)-(ii), (d)-(iii)

864351388. (a)-(v), (b)-(i), (c)-(ii), (d)-(iii)

Question Number : 38 Question Id : 864351128 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Given below are two statement : one is labelled as **Assertion A** and the other is labelled as **Reason R** :

Assertion A : Size of Bk^{3+} ion is less than Np^{3+} ion.

Reason R : The above is a consequence of the lanthanoid contraction.

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

Options :

864351389. Both **A** and **R** are true and **R** is the correct explanation of **A**

864351390. Both **A** and **R** are true but **R** is not the correct explanation of **A**

864351391. **A** is true but **R** is false

864351392. **A** is false but **R** is true

Question Number : 39 Question Id : 864351129 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Given below are two statements :

Statement I : The E° value for Ce^{4+}/Ce^{3+} is $+1.74$ V.

Statement II : Ce is more stable in Ce^{4+} state than Ce^{3+} state.

In the light of the above statements, choose the **most appropriate** answer from the options given below :

Options :

864351393. Both **statement I** and **statement II** are correct

864351394. Both statement I and statement II are incorrect

864351395. Statement I is correct but statement II is incorrect

864351396. Statement I is incorrect but statement II is correct

Question Number : 40 Question Id : 864351130 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The type of pollution that gets increased during the day time and in the presence of O_3 is :

Options :

864351397. Reducing smog

864351398. Oxidising smog

864351399. Acid rain

864351400. Global warming

Question Number : 41 Question Id : 864351131 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

In chromotography technique, the purification of compound is independent of :

Options :

864351401. Solubility of the compound

864351402. Mobility or flow of solvent system

864351403. Length of the column or TLC plate

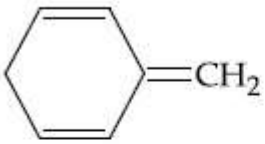
864351404. Physical state of the pure compound

Question Number : 42 Question Id : 864351132 Question Type : MCQ Option Sh

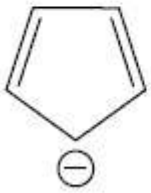
Question Mandatory : No

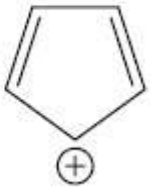
Correct Marks : 4 Wrong Marks : 1

Among the following, the aromatic compounds are :

(A) 

(B) 

(C) 

(D) 

Choose the **correct** answer from the following options :

Options :

864351405. (A) and (B) only

864351406. (A), (B) and (C) only

864351407. (B), (C) and (D) only

864351408. (B) and (C) only

Question Number : 43 Question Id : 864351133 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which of the following is Lindlar catalyst ?

Options :

864351409. Partially deactivated palladised charcoal

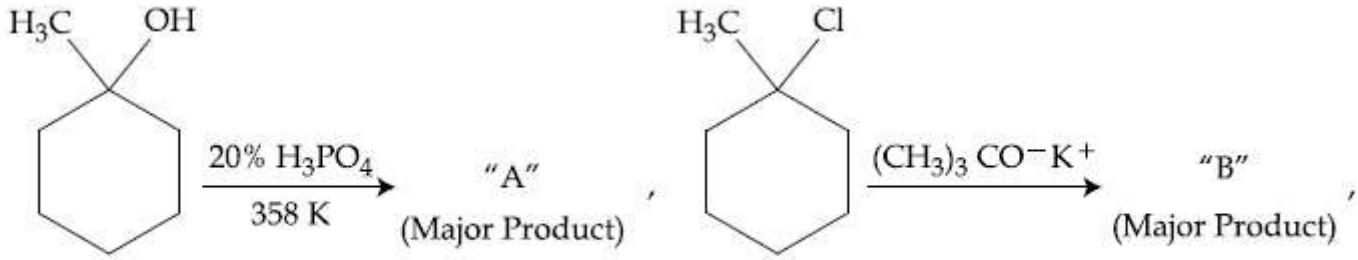
864351410. Sodium and Liquid NH_3

864351411. Cold dilute solution of $KMnO_4$

864351412. Zinc chloride and HCl

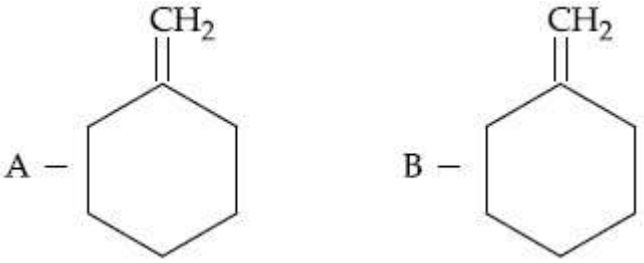
Question Number : 44 Question Id : 864351134 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

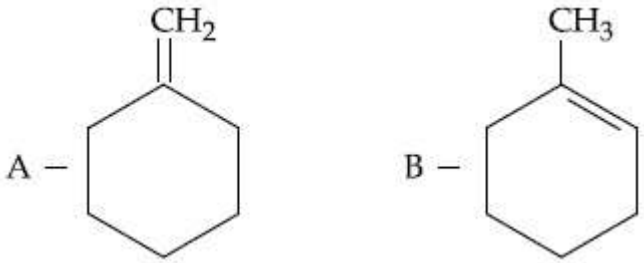


The products "A" and "B" formed in above reactions are :

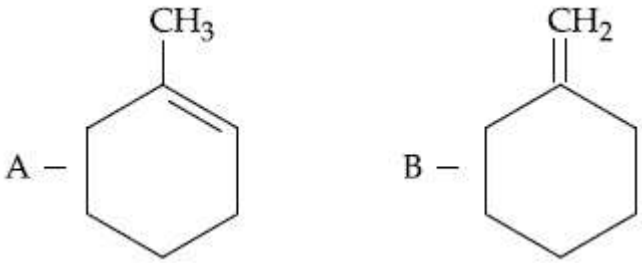
Options :



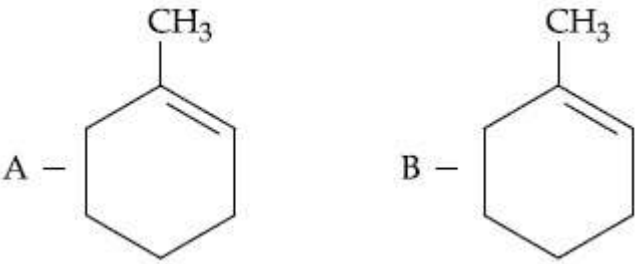
864351413.



864351414.



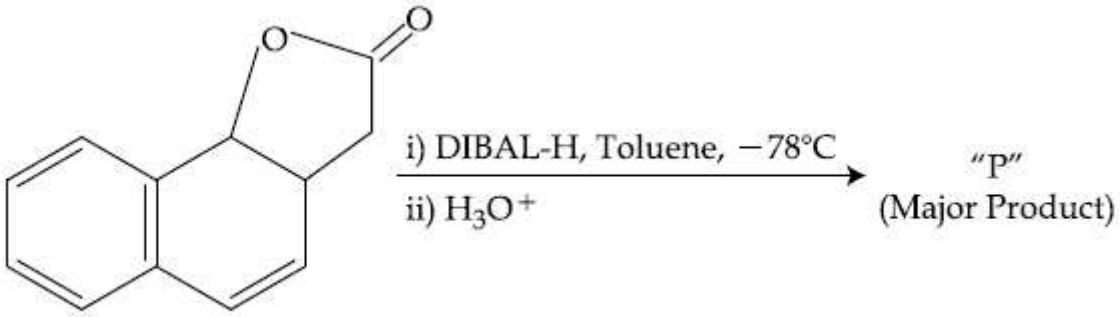
864351415.



864351416.

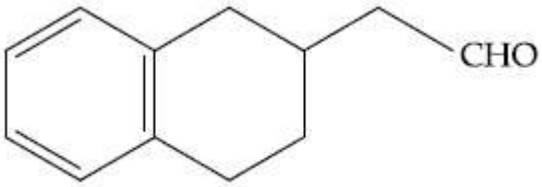
Question Number : 45 Question Id : 864351135 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

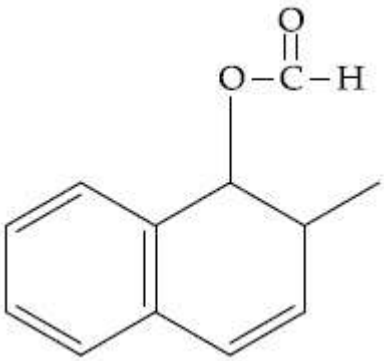


The product "P" in the above reaction is :

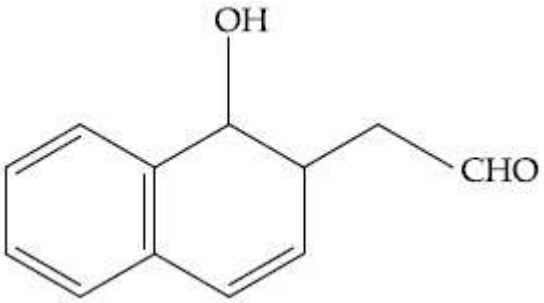
Options :



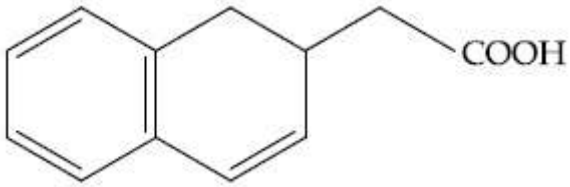
864351417.



864351418.



864351419.



864351420.

Question Number : 46 Question Id : 864351136 Question Type : MCQ Option Sh

Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Assertion A : Enol form of acetone [CH_3COCH_3] exists in < 0.1% quantity. However, the enol form of acetyl acetone [$CH_3COCH_2OCCH_3$] exists in approximately 15% quantity.

Reason R : Enol form of acetyl acetone is stabilized by intramolecular hydrogen bonding, which is not possible in enol form of acetone.

Choose the correct statement :

Options :

864351421. Both **A** and **R** are true and **R** is the correct explanation of **A**

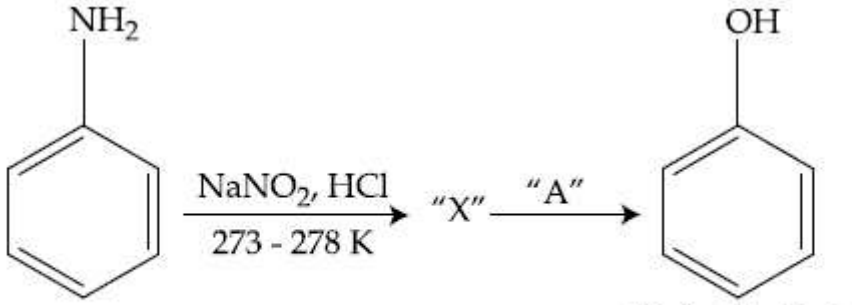
864351422. Both **A** and **R** are true but **R** is not the correct explanation of **A**

864351423. **A** is true but **R** is false

864351424. **A** is false but **R** is true

Question Number : 47 Question Id : 864351137 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

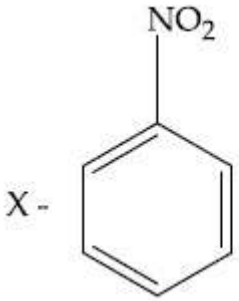
Correct Marks : 4 Wrong Marks : 1



Major Product

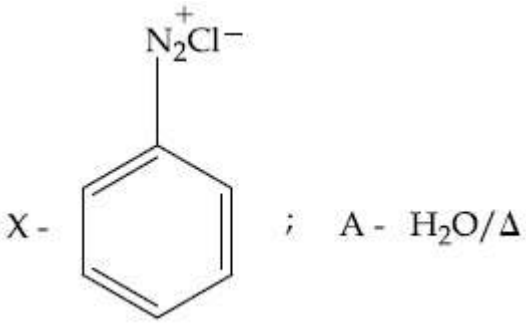
In the above chemical reaction, intermediate "X" and reagent/condition "A" are :

Options :

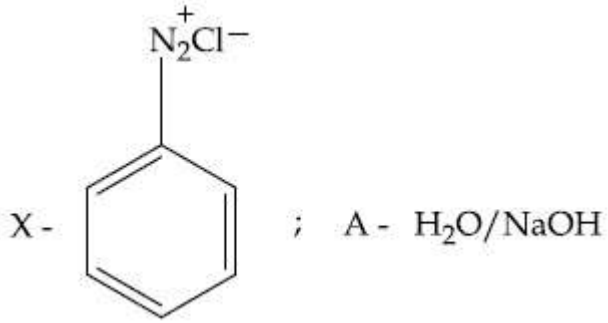


X - ; A - $H_2O/NaOH$

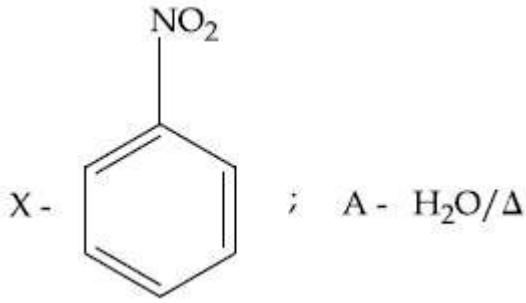
864351425.



864351426.



864351427.



864351428.

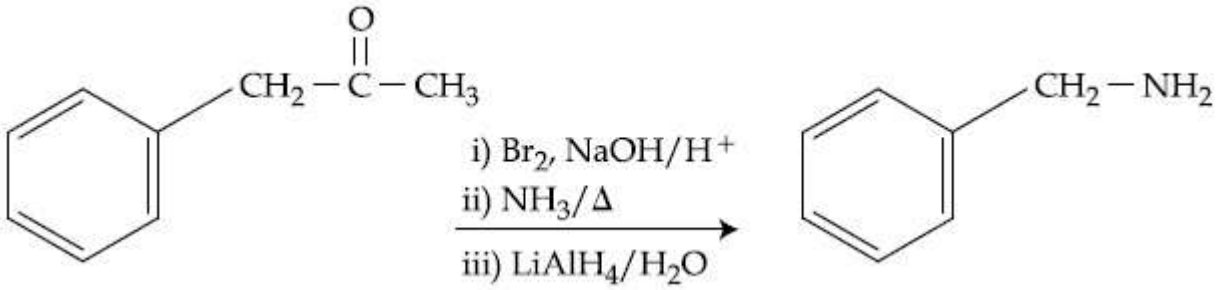
Question Number : 48 Question Id : 864351138 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

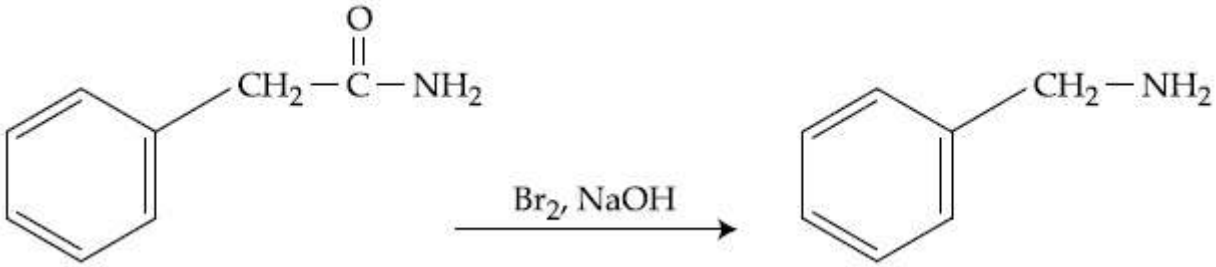
Correct Marks : 4 Wrong Marks : 1

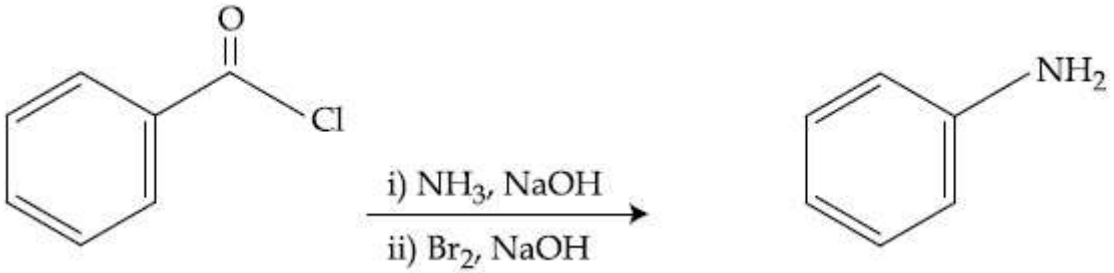
Which of the following reaction **DOES NOT** involve Hoffmann bromamide degradation ?

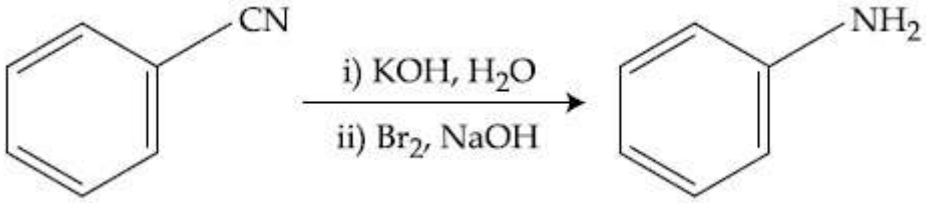
Options :

864351429.



864351430. 

864351431. 

864351432. 

Question Number : 49 Question Id : 864351139 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The functions of antihistamine are :

Options :

864351433. Antiallergic and Analgesic

864351434. Analgesic and antacid

864351435. Antacid and antiallergic

864351436. Antiallergic and antidepressant

Question Number : 50 Question Id : 864351140 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which among the following pairs of Vitamins is stored in our body relatively for longer duration ?

Options :

864351437. Thiamine and Ascorbic acid

864351438. Vitamin A and Vitamin D

864351439. Thiamine and Vitamin A

864351440. Ascorbic acid and Vitamin D

Chemistry Section B

Section Id :	86435110
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 :	86435110
Question Shuffling Allowed :	Yes

Question Number : 51 Question Id : 864351141 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

A 6.50 molal solution of KOH (aq.) has a density of 1.89 g cm^{-3}. The molarity of the solution is _____ mol dm^{-3}. (Round off to the Nearest Integer).

[Atomic masses : K : 39.0 u; O : 16.0 u; H : 1.0 u]

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
100

Question Number : 52 Question Id : 864351142 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

A certain element crystallises in a bcc lattice of unit cell edge length 27Å. If the same element under the same conditions crystallises in the fcc lattice, the edge length of the unit cell in Å will be _____. (Round off to the Nearest Integer).

[Assume each lattice point has a single atom]

[Assume $\sqrt{3} = 1.73$, $\sqrt{2} = 1.41$]

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
100

Question Number : 53 Question Id : 864351143 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

When light of wavelength 248 nm falls on a metal of threshold energy 3.0 eV, the de-Broglie wavelength of emitted electrons is _____ Å. (Round off to the Nearest Integer).

[Use : $\sqrt{3} = 1.73$, $h = 6.63 \times 10^{-34}$ Js

$m_e = 9.1 \times 10^{-31}$ kg ; $c = 3.0 \times 10^8$ ms^{-1} ; $1eV = 1.6 \times 10^{-19}$J]

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
100

Question Number : 54 Question Id : 864351144 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

For the reaction $A(g) \rightleftharpoons B(g)$ at 495 K, $\Delta_r G^\circ = -9.478$ kJ mol^{-1}.

If we start the reaction in a closed container at 495 K with 22 millimoles of A, the amount of B in the equilibrium mixture is _____ millimoles. (Round off to the Nearest Integer).

[$R = 8.314$ J mol^{-1} K^{-1} ; ln 10 = 2.303]

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes

Answers Type : Equal
Text Areas : PlainText
Possible Answers :
100

Question Number : 55 Question Id : 864351145 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

AB_2 is 10% dissociated in water to A^{2+} and B^-. The boiling point of a 10.0 molal aqueous solution of AB_2 is _____°C. (Round off to the Nearest Integer).

[Given : Molal elevation constant of water $K_b = 0.5$ K kg mol^{-1} boiling point of pure water = 100°C]

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
100

Question Number : 56 Question Id : 864351146 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

Two salts A_2X and MX have the same value of solubility product of 4.0×10^{-12}. The ratio of their molar solubilities i.e. $\frac{S(A_2X)}{S(MX)}$ = _____. (Round off to the Nearest Integer).

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
100

Question Number : 57 Question Id : 864351147 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

$$2\,MnO_4^- + b\,C_2O_4^{2-} + c\,H^+ \rightarrow x\,Mn^{2+} + y\,CO_2 + z\,H_2O$$

If the above equation is balanced with integer coefficients, the value of c is _____. (Round off to the Nearest Integer).

Response Type : Numeric

Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
100

Question Number : 58 Question Id : 864351148 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

The decomposition of formic acid on gold surface follows first order kinetics. If the rate constant at 300 K is $1.0 \times 10^{-3}\ s^{-1}$ and the activation energy $E_a = 11.488\ kJ\ mol^{-1}$, the rate constant at 200 K is _____ $\times 10^{-5}\ s^{-1}$. (Round off to the Nearest Integer).

(Given : R = 8.314 J $mol^{-1}\ K^{-1}$)

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
100

Question Number : 59 Question Id : 864351149 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

The equivalents of ethylene diamine required to replace the neutral ligands from the coordination sphere of the trans-complex of $CoCl_3 \cdot 4NH_3$ is _____. (Round off to the Nearest Integer).

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
100

Question Number : 60 Question Id : 864351150 Question Type : SA
Correct Marks : 4 Wrong Marks : 0

Complete combustion of 750 g of an organic compound provides 420 g of CO_2 and 210 g of H_2O. The percentage composition of carbon and hydrogen in organic compound is 15.3 and _____ respectively. (Round off to the Nearest Integer).

Response Type : Numeric

Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
100