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**Previous Year Paper
(Chemistry)
16 Aug, 2023 Shift 2**



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Notations :

- 1.Options shown in green color and with ✓ icon are correct.
- 2.Options shown in red color and with ✗ icon are incorrect.

Question Paper Name :	Chemistry 16th Aug 2023 Shift 2
Subject Name :	Chemistry
Creation Date :	2023-08-16 15:35:11
Duration :	120
Total Marks :	100
Display Marks:	Yes
Calculator :	None
Magnifying Glass Required? :	No
Ruler Required? :	No
Eraser Required? :	No
Scratch Pad Required? :	No
Rough Sketch/Notepad Required? :	No
Protractor Required? :	No
Show Watermark on Console? :	Yes
Highlighter :	No
Auto Save on Console?	Yes
Change Font Color :	No
Change Background Color :	No
Change Theme :	No
Help Button :	No

Show Reports : No

Show Progress Bar : No

Chemistry

Group Number : 1

Group Id : 59425395

Group Maximum Duration : 0

Group Minimum Duration : 120

Show Attended Group? : No

Edit Attended Group? : No

Break time : 0

Group Marks : 100

Is this Group for Examiner? : No

Examiner permission : Cant View

Show Progress Bar? : No

Chemistry

Section Id : 594253111

Section Number : 1

Section type : Online

Mandatory or Optional : Mandatory

Number of Questions : 100

Number of Questions to be attempted : 100

Section Marks : 100

Enable Mark as Answered Mark for Review and Clear Response : Yes

Maximum Instruction Time : 0

Sub-Section Number : 1

Sub-Section Id : 594253142

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 1 Question Id : 5942539424 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

Which principle states that the electrons are singly occupied before they get paired?

Options :

1. ✗ Pauli's Exclusion principle
2. ✓ Hund's rule
3. ✗ Aufbau principle
4. ✗ Heisenberg Uncertainty principle

Question Number : 2 Question Id : 5942539425 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

Which type of ions form more covalent bond?

Options :

1. ✓ Small cation and large anion
2. ✗ Large cation and small anion

3. ✖ Small cation and small anion

4. ✖ Large cation and large anion

Question Number : 3 Question Id : 5942539426 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

Which one of the following sequences of the cations represents the increasing order of the polarizing power?

Options :

1. ✖ $\text{Be}^+ < \text{K}^+ < \text{Mg}^{2+} < \text{Ca}^{2+}$

2. ✔ $\text{K}^+ < \text{Ca}^{2+} < \text{Mg}^{2+} < \text{Be}^{2+}$

3. ✖ $\text{Ca}^{2+} < \text{Mg}^{2+} < \text{K}^+ < \text{Be}^+$

4. ✖ $\text{K}^+ < \text{Mg}^{2+} < \text{Ca}^{2+} < \text{Be}^+$

Question Number : 4 Question Id : 5942539427 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

The compound which is having pentagonal bipyramidal geometry with two types of bond angle is

Options :

1. ✗ BrF_5

2. ✗ ClF_5

3. ✗ IF_5

4. ✓ IF_7

Question Number : 5 Question Id : 5942539428 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

Which of the statements regarding ozone is NOT correct?

Options :

1. ✗ The ozone molecule is angular in shape

2. ✗ The ozone is resonance hybrid of two structures

3. ✓ The oxygen-oxygen bond length in ozone is identical with that of molecular hydrogen

4. ✗ Ozone is used as germicide and disinfectant for the purification of air

Question Number : 6 Question Id : 5942539429 Question Type : MCQ Option Shuffling : Yes Is
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum
Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

What is the basicity of H_3PO_2 , H_3PO_3 and H_3PO_4 ?

Options :

1. ✗ 2, 2 and 3

2. ✗ 2, 3 and 3

3. ✗ 1, 3 and 3

4. ✓ 1, 2 and 3

Question Number : 7 Question Id : 5942539430 Question Type : MCQ Option Shuffling : Yes Is
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum
Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

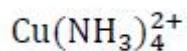
The ion which is NOT in tetrahedral structure is?

Options :

1. ✗ BF_4^-

2. ✗ NH_4^+

3. ✓

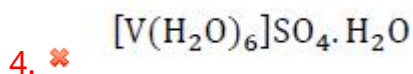
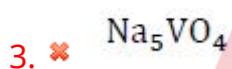
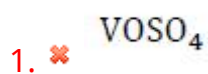


Question Number : 8 Question Id : 5942539431 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

Which one is COLOURLESS compound among the following?

Options :



Question Number : 9 Question Id : 5942539432 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

The common coordination numbers of f-block elements are

Options :

1. ✗ 6 and 7

2. ✓ 8 and 9

3. ✗ 5 and 6

4. ✗ 4 and 6

Question Number : 10 Question Id : 5942539433 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

What is anode and cathode used in electrolytic refining of copper?

Options :

1. ✗ Pure copper is anode and impure copper is cathode

2. ✓ Impure copper is anode and pure copper is cathode

3. ✗ Pure copper is cathode and pure zinc is anode

4. ✗ Impure copper is anode and pure zinc is cathode

Question Number : 11 Question Id : 5942539434 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

Presence of a slight amount of impurity in a metal will change the following property of a metal?

- A) Semi conduction
- B) Deformation
- C) Mechanical properties

Options :

1. ✖ A and C only

2. ✖ B and C only

3. ✔ A, B and C

4. ✖ C only

Question Number : 12 Question Id : 5942539435 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

Which one of the following alloy is used as solder?

Options :

1. ✔ Brazing alloy

2. ✖ Wood metal

3. ✖

Rose metal

4. ✖ Dutch metal

Question Number : 13 Question Id : 5942539436 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

Electrolytic reduction of alumina to aluminium by Hall-Heroult process is carried out

Options :

1. ✖ In the presence of NaCl

2. ✖ In the presence of fluorite

3. ✔ In the presence of cryolite which forms a melt with lower melting temperature

4. ✖ In the presence of cryolite which forms a melt with higher melting point

Question Number : 14 Question Id : 5942539437 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

A complex has highest value of CFSE. What does it indicate?

Options :

1. ✖

Complex is thermodynamically stable and kinetically labile

2. ✗ Complex is thermodynamically unstable and kinetically inert

3. ✓ Complex is thermodynamically stable and kinetically inert

4. ✗ Complex is thermodynamically unstable and kinetically labile

Question Number : 15 Question Id : 5942539438 Question Type : MCQ Option Shuffling : Yes Is
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum
Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

How many microstates are possible for d^5 electron configuration?

Options :

1. ✗ 120

2. ✗ 210

3. ✗ 45

4. ✓ 252

Question Number : 16 Question Id : 5942539439 Question Type : MCQ Option Shuffling : Yes Is
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

How many spin allowed electronic transitions are possible for the complex $[\text{Ni}(\text{NH}_3)_6]^{2+}$?

Options :

1. ✓ 3

2. ✗ 2

3. ✗ 1

4. ✗ Zero

Question Number : 17 Question Id : 5942539440 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

Identify the correct order of the orbitals in increasing order of their energy in crystal field splitting diagram of distorted octahedral (tetragonal) complex?

Options :

1. ✓ $d_{xz}, d_{yz} < d_{xy} < d_z^2 < d_{x^2-y^2}$

2. ✗ $d_{xz}, d_{yz} < d_{xy} < d_{x^2-y^2} < d_z^2$

3. ✗ $d_{x^2-y^2} < d_z^2 < d_{xy} < d_{xz}, d_{yz}$

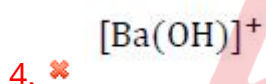
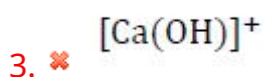
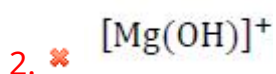
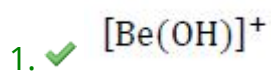
4. ✖ $d_{xz}, d_{yz} = d_{xy} < d_z^2 = d_{x^2-y^2}$

Question Number : 18 Question Id : 5942539441 Question Type : MCQ Option Shuffling : Yes Is
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum
Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

Which one of the following complexes is more stable?

Options :

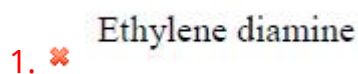


Question Number : 19 Question Id : 5942539442 Question Type : MCQ Option Shuffling : Yes Is
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum
Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

The Cu(II) metal ion which form octahedral complexes with the following ligands.
Which one among the following ligand forms less stable complex?

Options :



2. ✖ Propylene diamine

3. ✔ Butylene diamine

4. ✖ Methyl ethylene diamine

Question Number : 20 Question Id : 5942539443 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

What is the correct order of their stability for the given metal ions?

Options :

1. ✖ $\text{Na}^+ > \text{Ca}^{2+} > \text{Y}^{3+} > \text{Th}^{4+}$

2. ✔ $\text{Na}^+ < \text{Ca}^{2+} < \text{Y}^{3+} < \text{Th}^{4+}$

3. ✖ $\text{Th}^{4+} > \text{Ca}^{2+} > \text{Y}^{3+} > \text{Na}^+$

4. ✖ $\text{Y}^{3+} > \text{Th}^{4+} > \text{Ca}^{2+} > \text{Na}^+$

Question Number : 21 Question Id : 5942539444 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

When Cd^{2+} ion reacts with ammonia and form a complex $[\text{Co}(\text{NH}_3)_4]^{2+}$. The step-wise formation constants are determined as K_1 , K_2 , K_3 and K_4 . What is the correct order?

Note: For this question, discrepancy is found in question/answer. Full Marks is being awarded to all candidates.

Options :

1. $K_1 > K_2 > K_3 > K_4$

2. $K_1 < K_2 < K_3 < K_4$

3. $K_1 = K_2 = K_3 < K_4$

4. $K_1 > K_2 = K_3 = K_4$

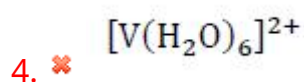
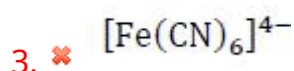
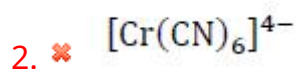
Question Number : 22 Question Id : 5942539445 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

Which one of the following complexes is labile?

Options :

1. ✓ $[\text{Fe}(\text{H}_2\text{O})_6]^{2+}$

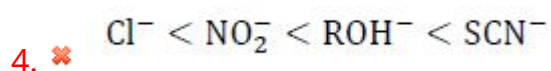
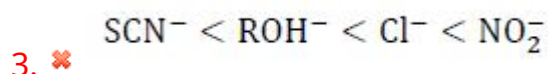
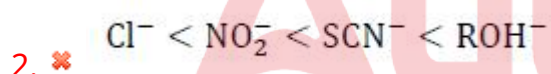
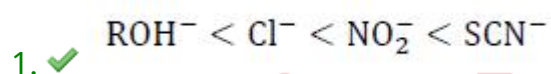


Question Number : 23 Question Id : 5942539446 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

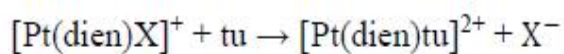
$\text{trans-}[\text{PtL}_2\text{Cl}_2] + \text{Y}^- \rightarrow \text{trans-}[\text{PtL}_2\text{ClY}] + \text{Cl}^-$. What is the correct order of ligand substitution reaction for different entering ligands Y?

Options :



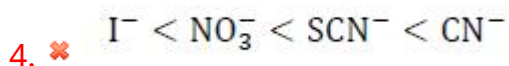
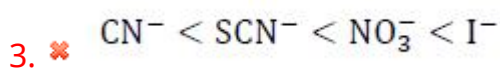
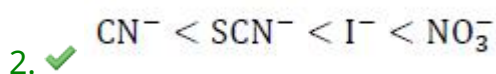
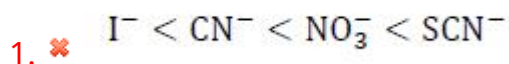
Question Number : 24 Question Id : 5942539447 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25



What is the correct order of substitution reaction for different leaving ligand X^- ?

Options :



Question Number : 25 Question Id : 5942539448 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

How many bridged carbonyls are present in $\text{Ir}_4\text{CO}_{12}$?

Options :

1. ✓ 0

2. ✗ 1

3. ✗ 2

4. ✖ 3

Question Number : 26 Question Id : 5942539449 Question Type : MCQ Option Shuffling : Yes Is
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum
Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

What is the product obtained when ferrocene reacts with 1, 1-dichloro methyl ether?

Options :

1. ✖ Methyl ferrocene
2. ✖ Ethyl ferrocene
3. ✔ Formyl ferrocene
4. ✖ 2-Ferrocenyl ethanol

Question Number : 27 Question Id : 5942539450 Question Type : MCQ Option Shuffling : Yes Is
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum
Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

Which carbonyl among the following does NOT exist?

Options :

1. ✖ $V(CO)_6$

2. ✗ $\text{Cr}(\text{CO})_6$

3. ✓ $\text{Mn}(\text{CO})_6$

4. ✗ $\text{Fe}_3(\text{CO})_{12}$

Question Number : 28 Question Id : 5942539451 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

Which one among the following is biologically important and essential ultra trace element?

Options :

1. ✗ Cu

2. ✓ Ni

3. ✗ Fe

4. ✗ Zn

Question Number : 29 Question Id : 5942539452 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

Identify the correct oxygen transport proteins from the following.

- A) Hemoglobin
- B) Hemerythrin
- C) Hemocyanin

Options :

1. ✗ A only
2. ✓ A, B and C
3. ✗ A and C only
4. ✗ A and B only

Question Number : 30 Question Id : 5942539453 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

Which one is the correct order of increasing strength of adsorption in column chromatography?

Options :

1. ✓ Alkenes < Ethers < Esters < Ketones
2. ✗ Ketones < Esters < Ethers < Alkenes
3. ✗ Alkenes < Ketones < Esters < Ethers

4. ✖ Ethers < Alkenes < Ethers < Ketones

Question Number : 31 Question Id : 5942539454 Question Type : MCQ Option Shuffling : Yes Is
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum
Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

Which one of the following solvents is having better separation capacity in chromatography?

Options :

1. ✔ Toluene
2. ✖ Carbon tetrachloride
3. ✖ Cyclohexane
4. ✖ n-Hexane

Question Number : 32 Question Id : 5942539455 Question Type : MCQ Option Shuffling : Yes Is
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum
Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

Which one of the following is NOT used as carrier gas in Gas chromatography?

Options :

1. ✖ Hydrogen

2. ✓ Oxygen

3. ✗ Nitrogen

4. ✗ Argon

Question Number : 33 Question Id : 5942539456 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

The shortest wavelength of hydrogen atom in Lyman series is x , what is the longest wavelength in Paschen series of He^+ ?

Options :

1. ✗ $\frac{9x}{5}$

2. ✗ $\frac{5x}{9}$

3. ✗ $\frac{36x}{5}$

4. ✓ $\frac{36x}{7}$

Question Number : 34 Question Id : 5942539457 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

When a Uranyl Oxalate Actinometer was active for 5 minutes of exposure to light of 400 nm, the concentration of oxalate ion fell from an initial value of 0.04 M to 0.02 M. The same light for the same duration has photolysed 0.0066 M of H_2O_2 to water. What is the Quantum Yield of Photolysis of H_2O_2 ?

Options :

1. ✗ $\phi \approx 33$
2. ✓ $\phi \approx 0.33$
3. ✗ $\phi \approx 3.3$
4. ✗ $\phi \approx 0.66$

Question Number : 35 Question Id : 5942539458 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

An aqueous solution is isotonic in HCl, NaCl and K_2SO_4 . The amounts of the ions, H^+ , Na^+ , K^+ , Cl^- and SO_4^{2-} in their ppm units are in the order of

Options :

1. ✗ $\text{H}^+ < \text{Na}^+ < \text{K}^+ < \text{Cl}^- < \text{SO}_4^{2-}$
2. ✗ $\text{SO}_4^{2-} < \text{Cl}^- < \text{Na}^+ < \text{K}^+ < \text{H}^+$

3. ✖ $H^+ > Na^+ < Cl^- < K^+ < SO_4^{2-}$

4. ✔ $H^+ < Na^+ > Cl^- < K^+ < SO_4^{2-}$

Question Number : 36 Question Id : 5942539459 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

The formula weight of a M_2X_3 type salt is 120 and its solubility in water at 25 °C is 60g/L. How much is its Solubility Product at this temperature?
(Assume the solution is ideal)

Options :

1. ✔ 3.375

2. ✖ 0.0313

3. ✖ 0.500

4. ✖ 2.500

Question Number : 37 Question Id : 5942539460 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

Match the facts on the left column with the items on the right column

- | | |
|--|------------------------|
| A) [Acetic Acid] = [Sodium Acetate] = 1×10^{-2} M | (i) $pK_b \approx 9.3$ |
| B) Deg. of Dissociation = 0.1 at $[HX] = 0.1$ M | (ii) $pH = pK_a$ |
| C) NH_4OH is a weak base in water | (iii) $pK_b < pK_a$ |
| D) K_a of an HX is 2×10^{-5} in water | (iv) $pH = 2$ |

Options :

1. ✓ A – ii; B – iv; C – iii; D – i

2. ✗ A – iv; B – ii; C – i; D – iii

3. ✗ A – i; B – iii; C – ii; D – iv

4. ✗ A – iii; B – i; C – iv; D – ii

Question Number : 38 Question Id : 5942539461 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

In each of the following Statements, there is a pair of sentences. Identify the correct pair.

- The reaction, $MX + H_2O \rightarrow MOH + HX$ is called Hydrolysis of MX Salt; Hence, NaCl in water exists as a mixture of NaOH + HCl
- A homogeneous mixture of NH_4OH and NH_4NO_3 can act as a Buffer; the pH of this Buffer is given by the Henderson's Equation
- When a few drops of NaOAc are added to an aqueous solution of acetic acid the pH increases; this is due to Common Ion Effect
- A Tribasic Acid's is an acid that can release 3 protons sequentially; the overall pK_a is given by $pK_a = pK_{a1} pK_{a2} pK_{a3}$

Options :

1. ✗ Only A and B are properly related

2. ✓ Only B and C are properly related

3. ✗ Only A and C are properly related

4. ✗ Only D and A are properly related

Question Number : 39 Question Id : 5942539462 Question Type : MCQ Option Shuffling : Yes Is
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum
Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

5 moles of an ideal gas were isothermally and reversibly expanded from 10 L to 100 L at 27 °C. The ΔE , ΔH , and ΔS suffered per a mole of the gas in this expansion are,

Note: For this question, discrepancy is found in question/answer. Full Marks is being awarded to all candidates.

Options :

1. $\Delta E = 0$, $\Delta H \approx 1.6 \text{ kCal mol}^{-1}$ and $\Delta S \approx 0.46 \text{ Cal mol}^{-1} \text{ K}^{-1}$

2. $\Delta E = 0$, $\Delta H \approx 6.9 \text{ kCal mol}^{-1}$ and $\Delta S \approx 2.3 \text{ Cal mol}^{-1} \text{ K}^{-1}$

3. $\Delta E \approx 1.6 \text{ kCal mol}^{-1}$, $\Delta H \approx 1.6 \text{ kCal mol}^{-1}$ and $\Delta S \approx 1.6 \text{ kCal mol}^{-1} \text{ K}^{-1}$

4. $\Delta E \approx 1.6 \text{ kCal mol}^{-1}$, $\Delta H = 0$ and $\Delta S \approx 2.3 \text{ Cal mol}^{-1} \text{ K}^{-1}$

Question Number : 40 Question Id : 5942539463 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

5 moles of an ideal gas were isothermally compressed from an initial 1 atm pressure to a final 10 atm at 27 °C. How much is the approximate ΔG suffered by the gas during this process?

Options :

1. ✗ 3.0 kCal

2. ✓ 6.9 kCal

3. ✗ 125 kCal

4. ✗ 250 kCal

Question Number : 41 Question Id : 5942539464 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

In a particular isobaric reaction the ratio of the Gibbs' Free Energy of the reaction and the temperature was decreasing with temperature at the rate of 10 units per kelvin at 100 K. How much is the Heat of Reaction at these conditions?

Options :

1. ✗ -1×10^5 units

2. ✓ 1×10^5 units

3. ✗ -1×10^4 units

4. ✗ 1×10^4 units

Question Number : 42 Question Id : 5942539465 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

Which of the following is NOT a Maxwell's Equation?

Options :

1. ✗ $\left(\frac{\partial T}{\partial v}\right)_s = -\left(\frac{\partial P}{\partial s}\right)_v$

2. ✗ $\left(\frac{\partial T}{\partial P}\right)_s = \left(\frac{\partial v}{\partial s}\right)_P$

3. ✓ $\left(\frac{\partial S}{\partial v}\right)_T = -\left(\frac{\partial P}{\partial T}\right)_v$

4. ✗ $\left(\frac{\partial S}{\partial P}\right)_T = -\left(\frac{\partial v}{\partial T}\right)_P$

Question Number : 43 Question Id : 5942539466 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

Which of the following is the correct definition of 'Chemical Potential' of a component, i, in a solution of multiple solutes?

Options :

1. ✓ It is the rate of change of the Gibbs' Free Energy of the solution with the concentration of i
2. ✗ It is the rate of change of the Absolute Entropy of the solution with the concentration of all the solutes including i
3. ✗ It is the rate of change of the Gibbs' Free Energy of the solution with the number of moles of i and the solvent
4. ✗ It is the rate of change of the Mole Fraction of i with the number of moles of i

Question Number : 44 Question Id : 5942539467 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

Match the Equations correctly with the Names of scientists after them

Equations	Names
A) $\ln\left(\frac{P_1}{P_2}\right) = \frac{\Delta H_{vap}}{R} \left(\frac{1}{T_2} - \frac{1}{T_1}\right)$	i) Van't Hoff
B) $S_T = \int_0^T C_v \frac{dT}{T}$	ii) Clausius-Clapeyron
C) $\ln\left(\frac{K_2}{K_1}\right) = -\frac{\Delta H_o}{R} \left(\frac{1}{T_2} - \frac{1}{T_1}\right)$	iii) Gibbs-Duhem
D) $\frac{d\mu_B}{d\mu_A} = -\frac{n_A}{n_B}$	iv) Debye - Einstein

Options :

1. ✗ A - iv; B - iii; C - ii; D - i

2. ✗ A – iii; B – i; C – iv; D – ii

3. ✓ A – ii; B – iv; C – i; D – iii

4. ✗ A – i; B – ii; C – iii; D – iv

Question Number : 45 Question Id : 5942539468 Question Type : MCQ Option Shuffling : Yes Is
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum
Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

Which of the following statements is true from the view point of Transition State
Theory of Reaction Rates?

Options :

1. ✗ The Entropy of Activation, $\Delta S^\ddagger$ is positive but the Enthalpy of Activation, $\Delta H^\ddagger$ is
negative

2. ✓ The Entropy of Activation, $\Delta S^\ddagger$ is negative but the Enthalpy of Activation, $\Delta H^\ddagger$ is
positive

3. ✗ Both Entropy of Activation, $\Delta S^\ddagger$ and the Enthalpy of Activation, $\Delta H^\ddagger$ are positive

4. ✗ Both Entropy of Activation, $\Delta S^\ddagger$ and the Enthalpy of Activation, $\Delta H^\ddagger$ are negative

Question Number : 46 Question Id : 5942539469 Question Type : MCQ Option Shuffling : Yes Is
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

Which of the following equations is a correct expression for the rate of the opposing reaction, $A \rightleftharpoons B$ where k_f and k_b are the rate constants of the forward and backward reactions respectively and $[A]_0$ and $[A]$ are concentrations of A at $t = 0$ and $t = t$ respectively?

Options :

1. ✓ $\frac{d[A]}{dt} = k_b[A]_0 - (k_f + k_b)[A]$

2. ✗ $\frac{d[A]}{dt} = k_b[A] - (k_f + k_b)[A]_0$

3. ✗ $\frac{d[A]}{dt} = k_b[A]_0 - (k_f - k_b)[A]$

4. ✗ $\frac{d[A]}{dt} = k_b[A] + (k_f + k_b)[A]_0$

Question Number : 47 Question Id : 5942539470 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

What is the pH of the 2.00 M aqueous HCl solution if the ion-activity coefficient of H^+ ion in the solution is 0.1? (Assume complete ionisation of HCl)

Options :

1. ✗ $pH = 1.3010$

2. ✗ $pH = 0.301$

3. ✖ $\text{pH} = -0.301$

4. ✔ $\text{pH} = 0.699$

Question Number : 48 Question Id : 5942539471 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

When the temperature rose from 420 K to 466 K the rate constant of a reaction has increased from 2.3×10^{-3} to 0.23 s^{-1} . Which of the following is the closest Activation Energy of the reaction? (Take $R \approx 2 \text{ cal mol}^{-1}\text{K}^{-1}$)

Note: For this question, discrepancy is found in question/answer. Full Marks is being awarded to all candidates.

Options :

1. $19.57 \times 10^5 \text{ cal mol}^{-1}$

2. $39.14 \times 10^5 \text{ cal mol}^{-1}$

3. $1.957 \times 10^4 \text{ cal mol}^{-1}$

4. $3.91 \times 10^5 \text{ cal mol}^{-1}$

Question Number : 49 Question Id : 5942539472 Question Type : MCQ Option Shuffling : Yes Is
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum
Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

Select the correct statements with regard to the Nernst Equation for Concentration Cell

- A) The Nernst Equation has E^0 for both Concentration Cells with and without Transference
- B) The Nernst Equation has no E^0 for Concentration Cells without Transference but has E^0 in the case of Concentration Cells with Transference
- C) The Nernst Equation has no E^0 for both Concentration Cells with and without Transference but has Junction Potential in the Concentration Cells with Transference
- D) The Nernst Equation has no E^0 for both Concentration Cells with and without Transference but has Junction Potential in both the cases

Options :

1. ✗ Only A and D are correct
2. ✗ Only B and C are correct
3. ✓ Only C is correct
4. ✗ Only D is correct

Question Number : 50 Question Id : 5942539473 Question Type : MCQ Option Shuffling : Yes Is
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum
Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

Read the two statements, A and B carefully and select the correct relationship between them.

- A) The more the concentration of a strong electrolyte the more is its Conductivity
- B) The Equivalent Conductance of a strong electrolyte increases with its concentration

Options :

1. ✗ Statement A is correct but not B and hence one is not the result of the other
2. ✓ Statements A and B both are incorrect and no way related to each other
3. ✗ Statement A is incorrect but B is correct
4. ✗ Statement A is correct and B is the result of A

Question Number : 51 Question Id : 5942539474 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

A 50 mL solution of 0.08 M sodium hydroxide was mixed with another 50 mL solution of 0.04 M HCl. Which of the following is the best value for the ionic strength of the final solution?

Options :

1. ✓ 0.02 M
2. ✗ 0.06 M
3. ✗ 0.03 M

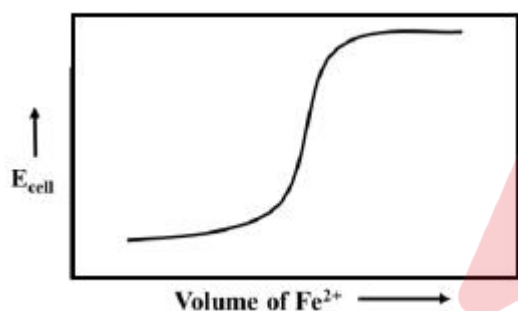
4. ✖ 0.04 M

Question Number : 52 Question Id : 5942539475 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

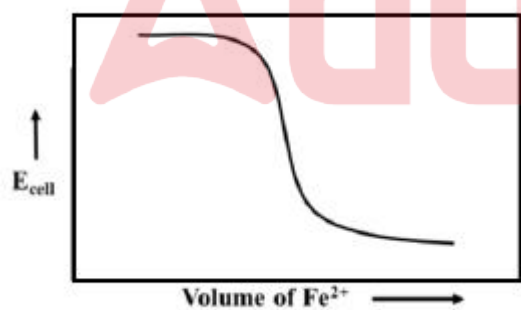
Correct Marks : 1 Wrong Marks : 0.25

The Standard Reduction Potential of $\text{Pt}|\text{Fe}^{3+}, \text{Fe}^{2+}(\text{aq})$ is + 0.77 V whereas that of $\text{Pt}|\text{Cr}_2\text{O}_7^{2-}, \text{Cr}^{3+}(\text{aq})$ is 1.33 V. Which among the following is the correct graph if a solution of acidified dichromate (titrand) in the cell is titrated potentiometrically against a solution of ferrous sulphate (titrant) from the burette?

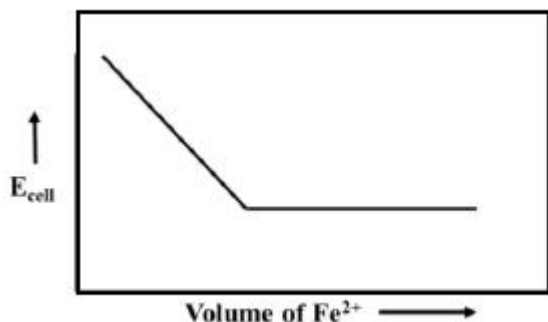
Options :



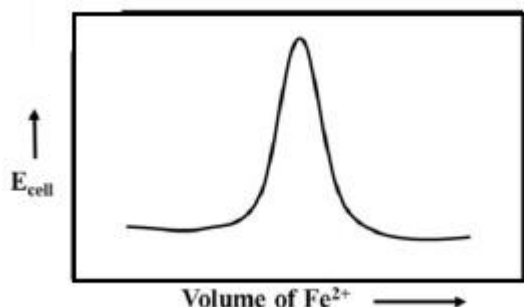
1. ✖



2. ✔



3. ✖



4. ✖

Question Number : 53 Question Id : 5942539476 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

Read the following two statements A and B and relate them.

- A) For all spontaneous chemical processes the ΔG is negative at constant temperature and pressure
- B) The Nernst Equation for the galvanic cells is derived from the Gibbs Equation

Options :

1. ✖ Both A and B are incorrect and are not related with each other

2. ✖ Only A is correct and B is incorrect

3. ✖ Both A and B are correct but are not related to each other

4. ✔ Both A and B are correct and B is the result of A

Question Number : 54 Question Id : 5942539477 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

The Debye-Huckel-Bjerrum Equation gives to the limiting law, $-\log \gamma_{\pm} = |z^+z^-| A (I)^{1/2}$, because,

Options :

1. ✗ The Ionic Strength, I , becomes negligible for dilute solutions when compared to 1

2. ✗ The solvent constant, A , becomes negligible for dilute solutions when compared to 1

3. ✗ The solute constant, B , becomes negligible in the full form of the Equation

4. ✓ The effective radius of the ion atmosphere, becomes negligible when compared to 1

Question Number : 55 Question Id : 5942539478 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

The Concentration Cell, $\text{Pb} | \text{PbSO}_4 | \text{K}_2\text{SO}_4(0.05 \text{ M}) || \text{K}_2\text{SO}_4(?) | \text{PbSO}_4 | \text{Pb}$, gave a potential of 0.0592 V. What is the concentration of K_2SO_4 in the right-side electrode?

Options :

1. ✓ 0.0005 M

2. ✗ 0.0500 M

3. ✗ 0.0025 M

4. ✖ 0.5000 M

Question Number : 56 Question Id : 5942539479 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

Which of the following statements is the reason for the curse, '*Ultraviolet Catastrophe*' in the studies of the Blackbody Radiation?

Options :

1. ✖ At low temperatures, Wiens Displacement Law is not in agreement with the results of Blackbody Radiation

2. ✖ The experimental results are not in agreement with the Raleigh-Jean's Law at high wavelengths of the emitted radiation

3. ✖ The experimental results are not in agreement with the Raleigh-Jean's Law at low frequencies of the emitted radiation

4. ✔ Raleigh-Jeans Law predicts exponential growth of energy of the radiation with frequency

Question Number : 57 Question Id : 5942539480 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

Read the following Statements with regard to Operators of well-behaved Functions and select the correct statement(s) that meet(s) the definition of Quantum Mechanical Hermitian Operators.

- A) The Eigen values of the functions are Real
- B) The Eigen values of the Functions can be Imaginary or Complex
- C) Any Two Eigen Functions for the same Operator are Orthogonal to each other
- D) All Hamiltonian Operators are also Hermitian Operators

Options :

1. ✖ Both A and D meet the definition of a Hermitian Operator
2. ✔ Only A and C meet the definition of a Hermitian Operator
3. ✖ Only D alone meets the definition of a Hermitian Operator
4. ✖ Any of A, B, C and D meets the definition of a Hermitian Operator

Question Number : 58 Question Id : 5942539481 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

Which of the following is the correct Schrodinger Equation for the Wave Function, Ψ ?

Options :

1. ✖ $-\frac{h^2}{8\pi^2m} \nabla^2 \Psi + V\Psi = E\Psi$
2. ✖ $-\frac{h^2}{8\pi^2m} \nabla^2 \Psi - V\Psi = E\Psi$

3. ✖
$$-\frac{8\pi^2m}{H^2}\nabla^2\Psi + V\Psi = E\Psi$$

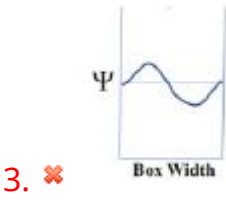
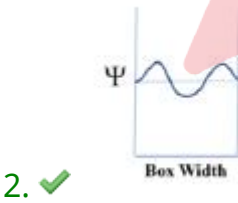
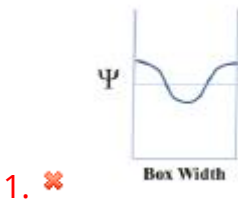
4. ✔
$$-\frac{h^2}{8\pi^2m}\nabla^2\Psi + V\Psi = E\Psi$$

Question Number : 59 Question Id : 5942539482 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

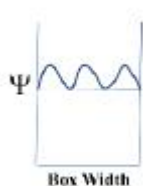
Correct Marks : 1 Wrong Marks : 0.25

Identify the correct plot for the wave function associated with a particle in one – dimension box with quantum number, n = 3

Options :



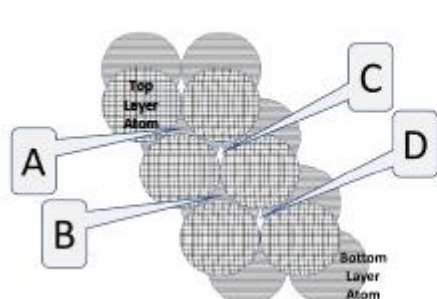
4. ✖



Question Number : 60 Question Id : 5942539483 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

From the figure shown below, identify Octahedral and Tetrahedral Voids



Options :

1. ✗ All A and C are Octahedral Voids
2. ✗ All B and D are Tetrahedral Voids
3. ✓ A and B are Tetrahedral whereas C and D are Octahedral Voids
4. ✗ A and B are Octahedral whereas C and D are Tetrahedral Voids

Question Number : 61 Question Id : 5942539484 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

Which of the following is the correct Helmholtz Equation?

Options :

1. ✗ $\Delta G = T\Delta S + \Delta H$

2. ✗ $\Delta A = \Delta H + T\Delta S$

3. ✗ $\Delta A = T\Delta S + \Delta E$

4. ✓ $\Delta E = \Delta A + T\Delta S$

Question Number : 62 Question Id : 5942539485 Question Type : MCQ Option Shuffling : Yes Is
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum
Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

The Standard Reduction Potential of $\text{Pt}|\text{Hg}|\text{Hg}_2^{2+}(\text{aq})$ is 0.80 V while the Reduction Potential of $\text{Pt}|\text{Hg}(\text{l})|\text{Hg}_2\text{Cl}_2(\text{s})|\text{Cl}^-(\text{aq})$ is 0.21 V. What is the Solubility Product(K_s) of Hg_2Cl_2 in water at 25 °C? (Assume $2.303(RT/F)$ as 0.059 V at 25 °C)

Options :

1. ✓ $K_s = 1 \times 10^{-20}$

2. ✗ $K_s \approx 1 \times 10^{34}$

3. ✗ $K_s = 1 \times 10^{-10}$

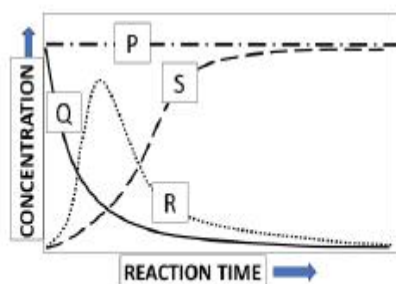
4. ✗

$$K_s \approx 1 \times 10^{-17}$$

Question Number : 63 Question Id : 5942539486 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

Which profile in the plot does best represent each of the concentrations of the reactant, [A], the intermediate, [I] and the final product, [B], and the total concentration $[A]_0 = [A] + [I] + [B]$, for the consecutive reaction, $A \rightarrow I \rightarrow B$?



Options :

1. ✗ P – [A]; Q – [I]; R – [B] and S – $[A]_0$
2. ✗ P – [I]; Q – [B]; R – [A] and S – $[A]_0$
3. ✗ P – $[A]_0$; Q – [B]; R – [A] and S – [I]
4. ✓ P – $[A]_0$; Q – [A]; R – [I] and S – [B]

Question Number : 64 Question Id : 5942539487 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

Which of the following is the correct statement to define the Franck-Condon Principle?

Options :

1. ✗ The nuclear coordinates change during a light-induced electronic-vibrational transition
2. ✓ The nuclear coordinates do not change during a light-induced electronic-vibrational transition
3. ✗ The nuclear coordinates change during a light-induced electronic transition but do not change during vibrational excitation
4. ✗ The nuclear coordinates change during a light-induced vibrational transition but do not change during electronic excitation

Question Number : 65 Question Id : 5942539488 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

20 mg of $\text{Hg}[\text{Co}(\text{SCN})_4]$ with a gram susceptibility, χ_g of 18 CGS units per gram has weighed 24 mg in a magnetic field. In the same magnetic field 36 mg of another solid powder measured a weight of 44 mg. How much is the gram magnetic susceptibility, χ_g of the solid test sample?

Options :

1. ✗ $\chi_g = 24$ CGS units per gram

2. ✓ $\chi_g = 20$ CGS units per gram

3. ✗ $\chi_g = 12$ CGS units per gram

4. ✗ $\chi_g = 27$ CGS units per gram

Question Number : 66 Question Id : 5942539489 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

Relate the following 5 band-structures to (i) Conductors, (ii) Semi-Conductors, (iii) Insulators, (iv) n-Type Semi-Conductors and (v) p-Type Semi-Conductors (wider strips are dopants)



Options :

1. ✗ (A) – (i); (B) – (iii); (C) – (ii); (D) – (iv) and (E) – (v)

2. ✗ (A) – (v); (B) – (iv); (C) – (iii); (D) – (i) and (E) – (ii)

3. ✓ (A) – (iii); (B) – (ii); (C) – (i); (D) – (v) and (E) – (iv)

4. ✖ (A) – (ii); (B) – (v); (C) – (iv); (D) – (iii) and (E) – (i)

Question Number : 67 Question Id : 5942539490 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

Which of the following statements does best describe the Meissner Effect?

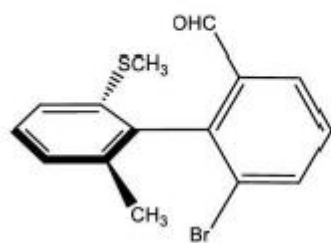
Options :

1. ✖ A superconductor gets attracted towards a magnet at low temperature
2. ✖ An insulator becomes a superconductor at very low temperature in a magnetic field
3. ✔ Nearby electrons with opposite spin form Cooper Pairs to be repelled by magnets
4. ✖ Nearby electrons with same spin form Cooper Pairs with enhanced magnetism

Question Number : 68 Question Id : 5942539491 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

The following compound has the configuration



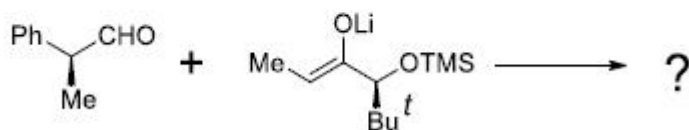
Options :

1. ✖ (S)-configuration
2. ✖ D-configuration
3. ✔ (R)-configuration
4. ✖ Configuration cannot be written

Question Number : 69 Question Id : 5942539492 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

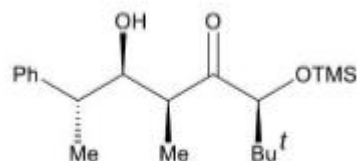
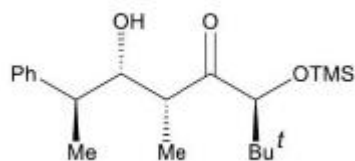
Correct Marks : 1 Wrong Marks : 0.25

The major product formed in the following reaction is

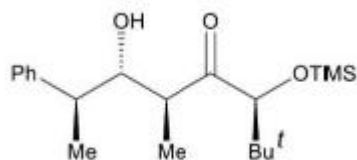


Options :

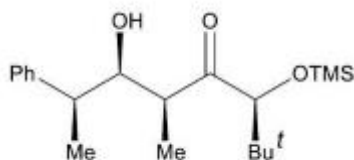
1. ✖



2. ✖



3. ✖

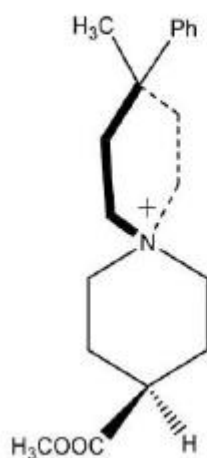


4. ✔

Question Number : 70 Question Id : 5942539493 Question Type : MCQ Option Shuffling : Yes Is
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum
Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

The absolute configuration of the following molecule is



Options :

1. ✗ (R)-configuration
2. ✓ (S)-configuration
3. ✗ Cis-configuration
4. ✗ Trans-configuration

Question Number : 71 Question Id : 5942539494 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

Choose the most preferred conformer for the compound trans-1-t-butyl-3-methylcyclohexane

Options :



1. ✗



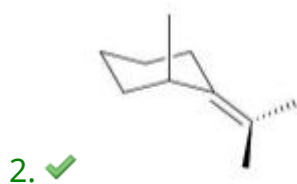
Question Number : 72 Question Id : 5942539495 Question Type : MCQ Option Shuffling : Yes Is
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum
Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

The most stable conformation of the following molecule is



Options :



3. ✖



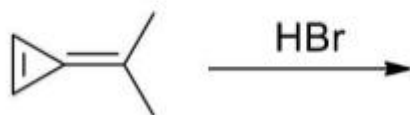
4. ✖



Question Number : 73 Question Id : 5942539496 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

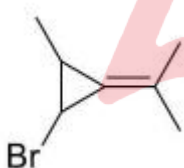
Correct Marks : 1 Wrong Marks : 0.25

What is the major product in the following reaction?

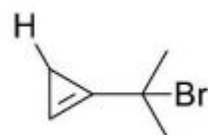


Options :

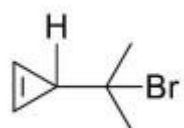
1. ✖

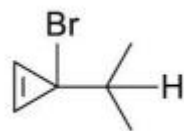


2. ✖



3. ✖





4. ✓

Question Number : 74 Question Id : 5942539497 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

Which of the following statements is **INCORRECT**?

Options :

1. ✗ Phenalene is not aromatic but the corresponding anion is aromatic
2. ✗ Azulene forms azulenium cation with strong acid
3. ✓ Azulene on heating above 350 °C gives anthracene
4. ✗ [18] annulene is a diatropic molecule

Question Number : 75 Question Id : 5942539498 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

[10]-annulene is

Options :

1. ✗ aromatic

2. ✓ non-aromatic

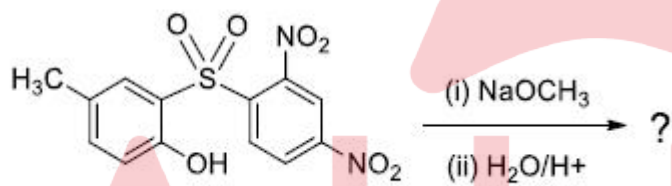
3. ✗ anti-aromatic

4. ✗ Homoaromatic

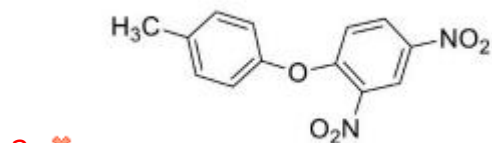
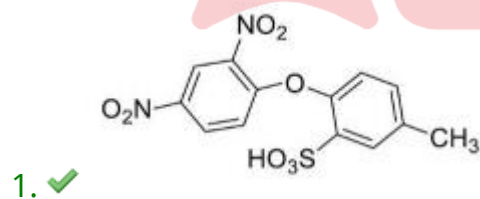
Question Number : 76 Question Id : 5942539499 Question Type : MCQ Option Shuffling : Yes Is
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum
Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

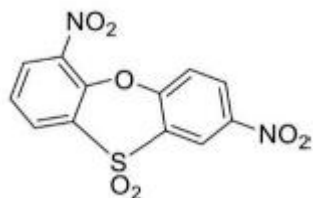
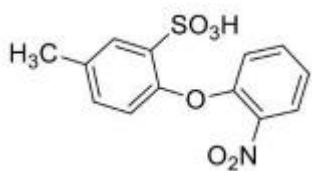
The product formed in the following reaction is



Options :



3. ✗

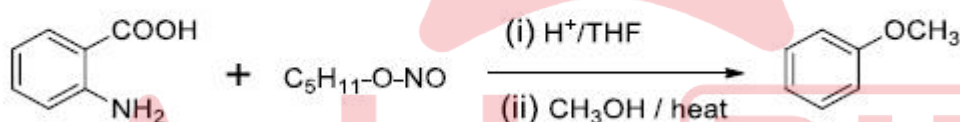


4. ✖

Question Number : 77 Question Id : 5942539500 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

The following chemical reaction involves by



Options :

1. ✖ Carbocation intermediate

2. ✖ Carbene intermediate

3. ✖ Nitrene intermediate

4. ✔ Benzyne intermediate

Question Number : 78 Question Id : 5942539501 Question Type : MCQ Option Shuffling : Yes Is
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum
Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

Which among the following is a correct statement?

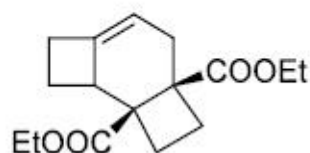
Options :

1. ✗ The boat conformation of cyclohexane is about 44 kcal/mol higher in energy than the chair form
2. ✓ The boat conformation of cyclohexane is about 6.9 kcal/mol higher in energy than the chair form
3. ✗ The chair conformation of cyclohexane is about 2.9 kcal/mol higher in energy than the boat form
4. ✗ The chair conformation of cyclohexane is about 25 kcal/mol higher in energy than the boat form

Question Number : 79 Question Id : 5942539502 Question Type : MCQ Option Shuffling : Yes Is
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum
Instruction Time : 0

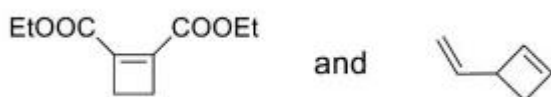
Correct Marks : 1 Wrong Marks : 0.25

The correct starting materials for the synthesis of the following target molecule

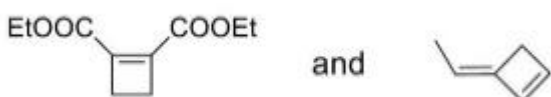


Options :

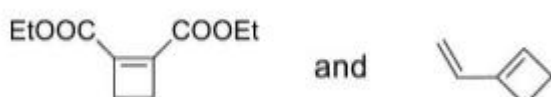
1. ✖



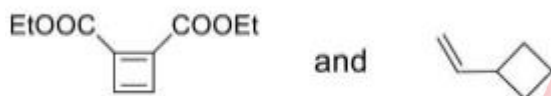
2. ✖



3. ✔



4. ✖



Question Number : 80 Question Id : 5942539503 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

The percentage of atom economy for the formation of N-methyl propenamide in the following reaction is



Options :

1. ✖ 98.52%

2. ✖ 72.46%

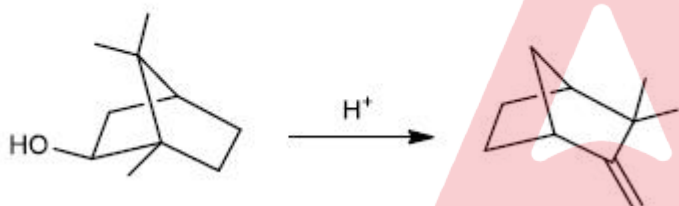
3. ✓ 65.41%

4. ✗ 35.42%

Question Number : 81 Question Id : 5942539504 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

The name of the following reaction is



Options :

1. ✗ Pinacol-Pinacolone rearrangement

2. ✗ Beckmann-rearrangement

3. ✗ Wolf rearrangement

4. ✓ Wagner-Meerwein rearrangement

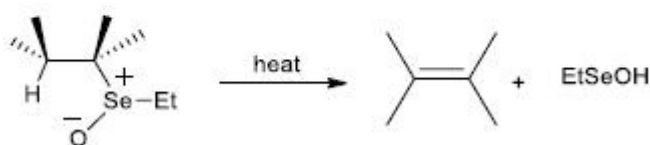
Question Number : 82 Question Id : 5942539505 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

The following reaction is a/an



Options :

1. ✖ Pyrolytic anti elimination

2. ✖ E₂ elimination

3. ✔ Pyrolytic syn elimination

4. ✖ E₁CB elimination

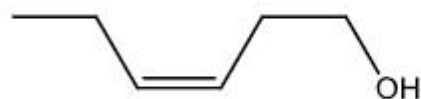
Question Number : 83 Question Id : 5942539506 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

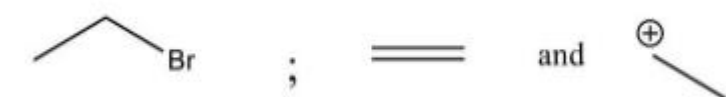
The suitable reagents and synthons for the synthesis of target molecule are



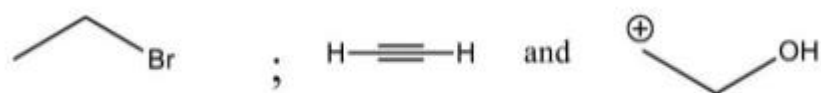
(Target Molecule)

Options :

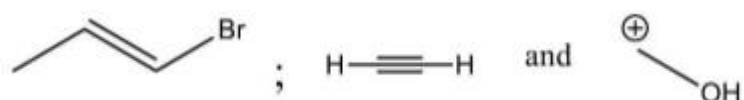
1. ✖



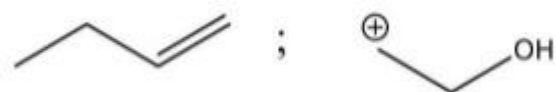
2. ✓



3. ✗



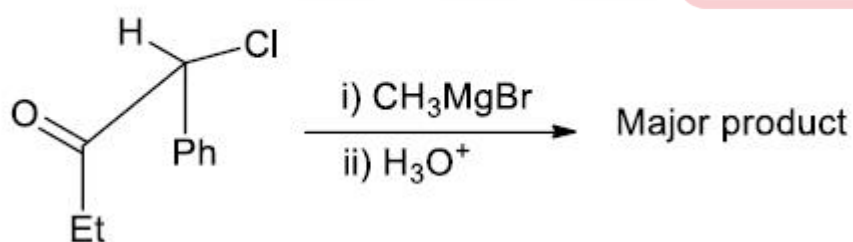
4. ✗



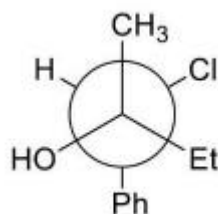
Question Number : 84 Question Id : 5942539507 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

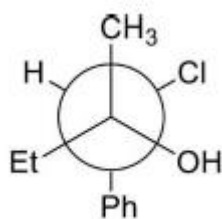
The major product formed in the following asymmetric synthesis is



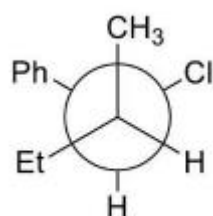
Options :



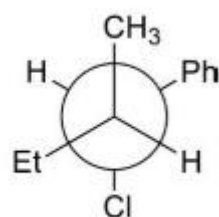
1. ✗



2. ✓



3. ✗



4. ✗

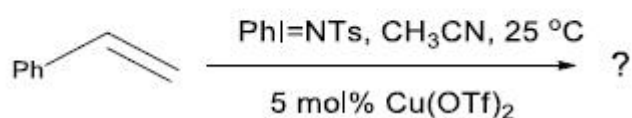
Question Number : 85 Question Id : 5942539508 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

The product formed in the following reaction is

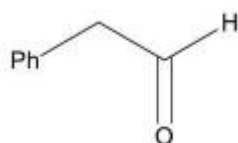
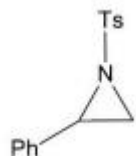


Options :

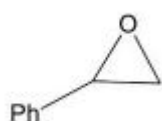
1. ✗



2. ✓



3. ✖



4. ✖

Question Number : 86 Question Id : 5942539509 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

The correct reagent for the following transformation is



Options :

1. ✖ LiAlH_4

2. ✖ NaBH_4

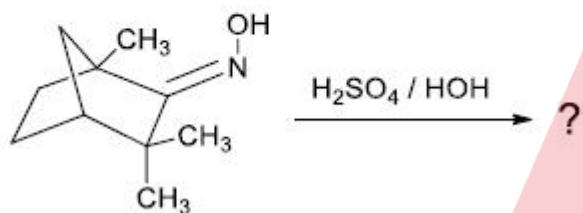
3. ✔ DIBALH

4. ✖ B_2H_6

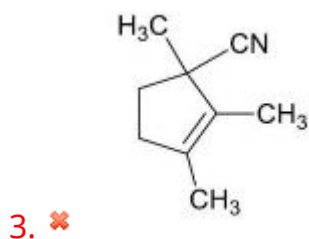
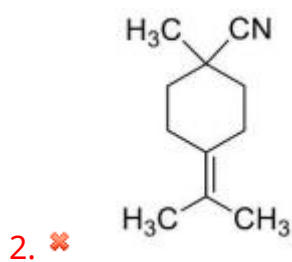
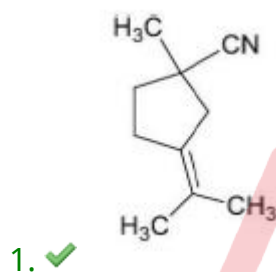
Question Number : 87 Question Id : 5942539510 Question Type : MCQ Option Shuffling : Yes Is
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum
Instruction Time : 0

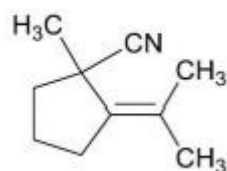
Correct Marks : 1 Wrong Marks : 0.25

The product formed in the following reaction is



Options :



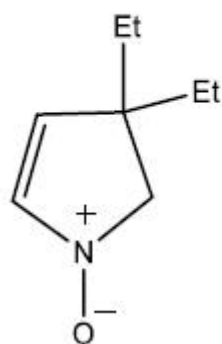


4. ✖

Question Number : 88 Question Id : 5942539511 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

The IUPAC nomenclature of the following heterocyclic compound is



Options :

1. ✖ 4, 4-Diethyl- Δ^3 -pyrrolidine N-oxide

2. ✖ 3, 3-Diethyl- Δ^3 -pyrroline N-oxide

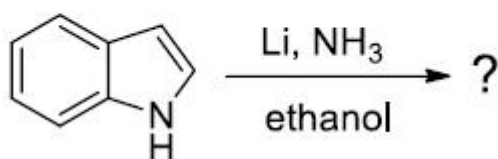
3. ✖ 4, 4-Diethyl- Δ^2 -pyrrolidine N-oxide

4. ✔ 4, 4-Diethyl- Δ^2 -pyrroline N-oxide

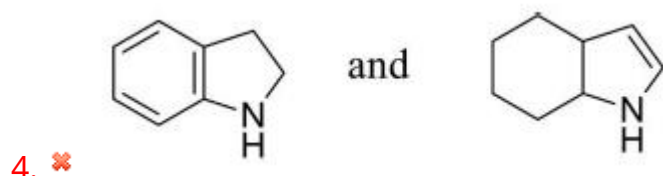
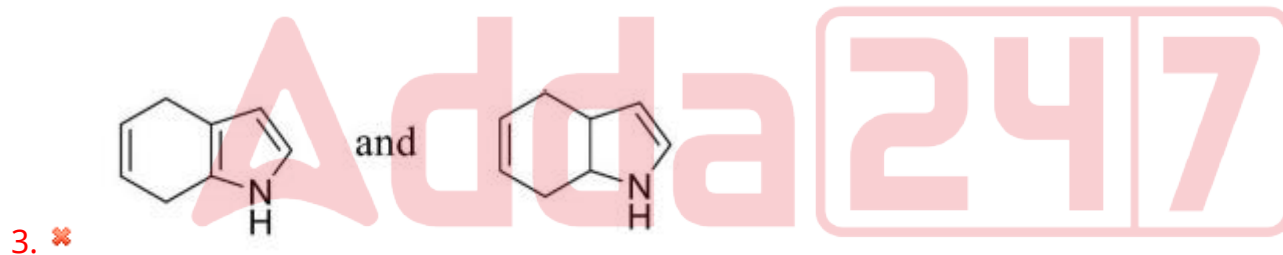
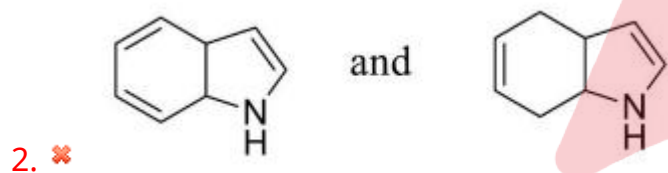
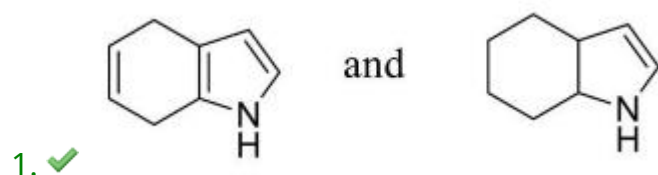
Question Number : 89 Question Id : 5942539512 Question Type : MCQ Option Shuffling : Yes Is
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum
Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

The products formed in the following reaction are



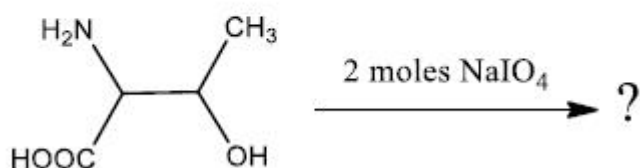
Options :



Question Number : 90 Question Id : 5942539513 Question Type : MCQ Option Shuffling : Yes Is
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum
Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

The products formed in the following reaction is



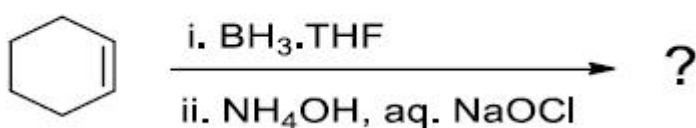
Options :

1. ✗ $\text{HOOC}-\text{CH}_2\text{NH}_2$ & $\text{H}_3\text{C}-\text{CHO}$
2. ✗ $\text{HOOC}-\text{NH}_2$ & $\text{H}_3\text{C}-\text{COOH}$
3. ✓ $\text{HOOC}-\text{CHO}$ & $\text{H}_3\text{C}-\text{COH}$
4. ✗ $\text{HOOC}-\text{CH}_2\text{OH}$ & $\text{H}_3\text{C}-\text{CHO}$

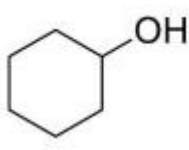
Question Number : 91 Question Id : 5942539514 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

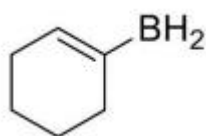
The product formed in the following reaction is



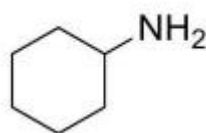
Options :

1. ✗ 

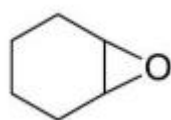
2. ✖



3. ✔



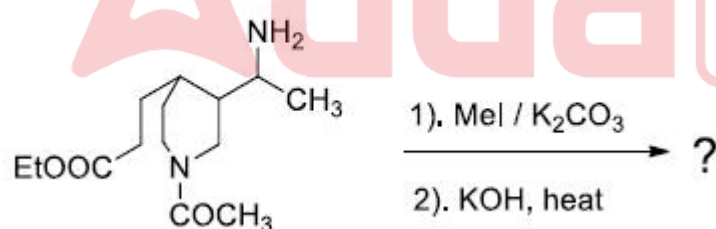
4. ✖



Question Number : 92 Question Id : 5942539515 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

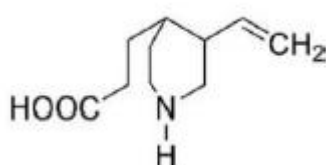
Correct Marks : 1 Wrong Marks : 0.25

The product formed in the following reaction is

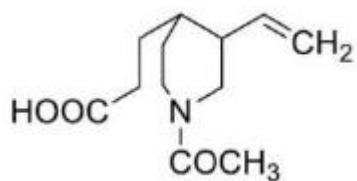


Options :

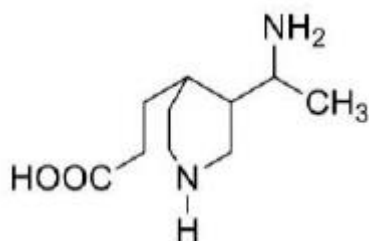
1. ✔



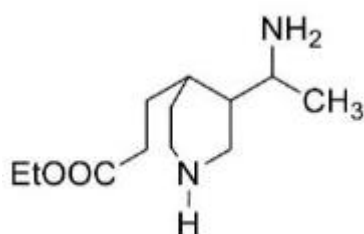
2. ✖



3. ✖

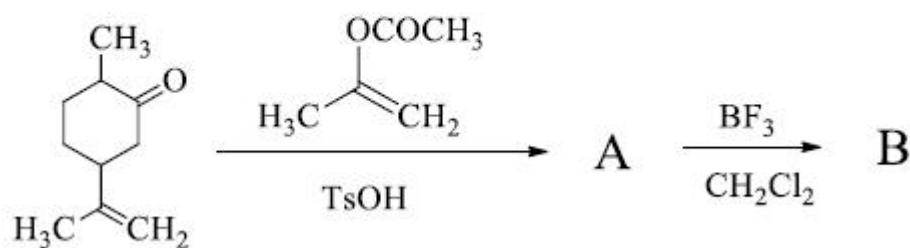


4. ✖



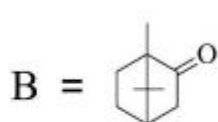
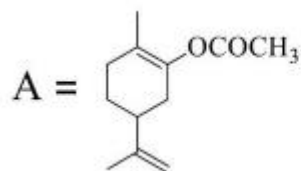
Question Number : 93 Question Id : 5942539516 Question Type : MCQ Option Shuffling : Yes Is
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum
Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0.25

In the following reactions sequence the 'A' and 'B' are

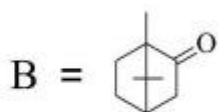
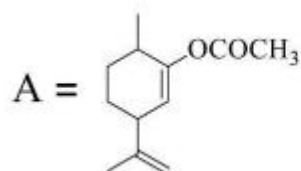


Options :

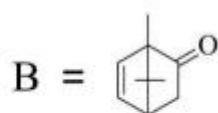
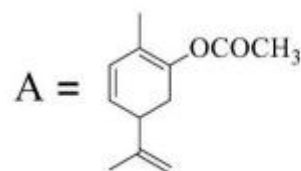
1. ✔



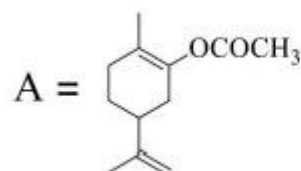
2. ✖



3. ✖



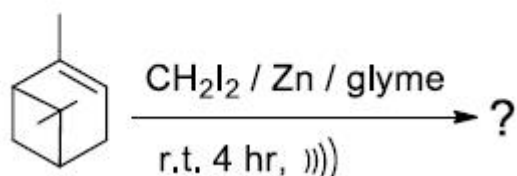
4. ✖



Question Number : 94 Question Id : 5942539517 Question Type : MCQ Option Shuffling : Yes Is
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum
Instruction Time : 0

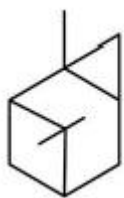
Correct Marks : 1 Wrong Marks : 0.25

The product formed in the following reaction is

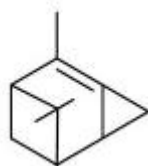


Options :

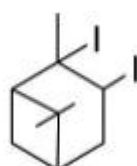
1. ✔



2. ✖



3. ✖



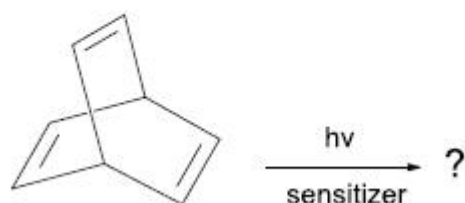
4. ✖



Question Number : 95 Question Id : 5942539518 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

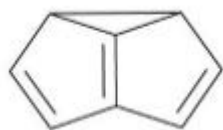
Correct Marks : 1 Wrong Marks : 0.25

The product formed in the following reaction is



Options :

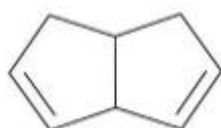
1. ✖



2. ✓



3. ✗

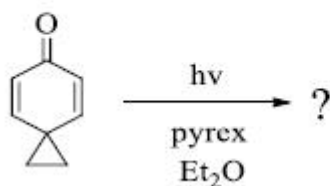


4. ✗



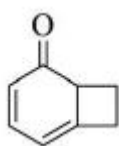
Question Number : 96 Question Id : 5942539519 Question Type : MCQ Option Shuffling : Yes Is
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum
Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0.25

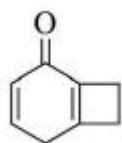
The product formed in the following photochemical reaction is



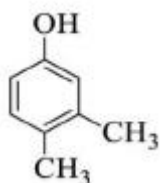
Options :

1. ✗

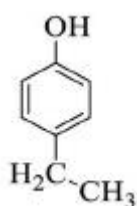




2. ✖



3. ✖

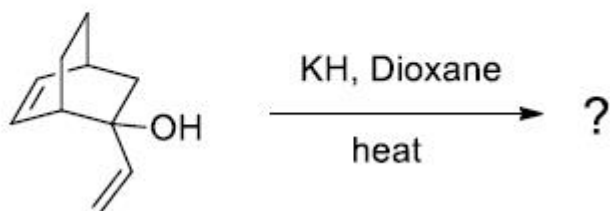


4. ✔

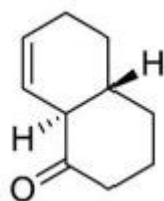
Question Number : 97 Question Id : 5942539520 Question Type : MCQ Option Shuffling : Yes Is
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum
Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

The product formed in the following reaction is



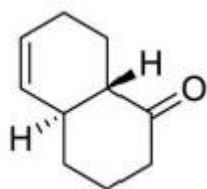
Options :



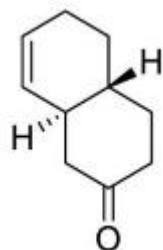
1. ✖

2.

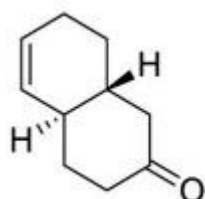
✗



3. ✗



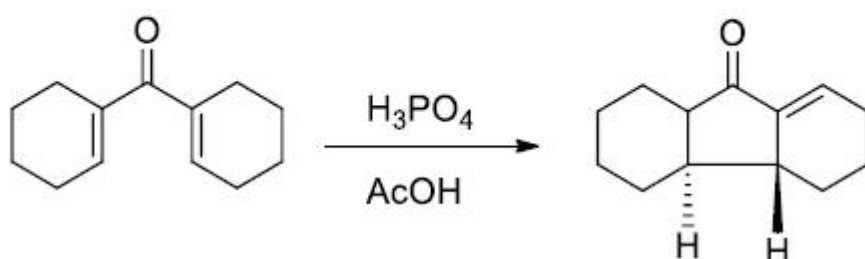
4. ✓



Question Number : 98 Question Id : 5942539521 Question Type : MCQ Option Shuffling : Yes Is
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum
Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

The following reaction involves



Options :

1. ✓

Thermal condition, Conrotatory

2. ✗

Thermal condition, Disrotatory

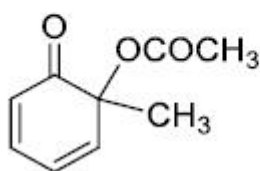
3. ✖ Photochemical condition, Conrotatory

4. ✖ Photochemical condition, Disrotatory

Question Number : 99 Question Id : 5942539522 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

What is the λ_{max} of the following compound?



Options :

1. ✔ 302 nm

2. ✖ 234 nm

3. ✖ 226 nm

4. ✖ 241 nm

Question Number : 100 Question Id : 5942539523 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

The relative intensity ratio of the molecular ion peaks, if a molecule contains two bromine atoms and one chlorine atom

$M : M+2 : M+4 : M+6$

Options :

1. ✖ $100 : 293.0 : 286.0 : 93.6$

2. ✖ $100 : 97.8 : 31.9 : 3.47$

3. ✔ $100 : 228.0 : 159.0 : 31.2$

4. ✖ $100 : 163.0 : 74.4 : 10.4$

