

TELANGANA RESIDENTIAL EDUCATIONAL INSTITUTIONS RECRUITMENT BOARD TREI-RB

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 19th Aug 2023 Shift 2
Subject Name :	Chemistry
Creation Date :	2023-08-19 17:23:40
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 : 594253122
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 : 594253138
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 : 594253182

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 1 Question Id : 59425312135 Question Type : MCQ Option Shuffling : Yes Is

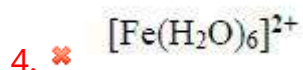
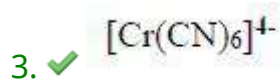
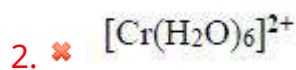
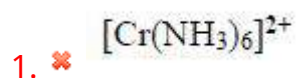
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Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

Which of the following is an inert complex?

Options :



Question Number : 2 Question Id : 59425312136 Question Type : MCQ Option Shuffling : Yes Is

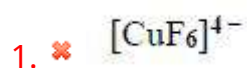
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

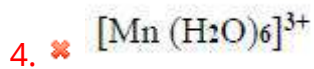
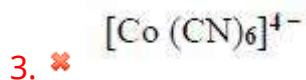
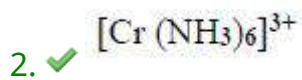
Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

Which of the following octahedral complexes will NOT show any Jahn-Teller distortion?

Options :





Question Number : 3 Question Id : 59425312137 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 d^2 ions has the highest tetrahedral crystal field splitting $(\Delta)_t$?

Options :



Question Number : 4 Question Id : 59425312138 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 which of the following complexes of Iron, the highest C – O stretching frequency is expected?

Options :

1. ✘ $\text{Fe}(\text{CO})_5$
2. ✔ $\text{Fe}(\text{CO})_4(\text{PF}_3)$
3. ✘ $\text{Fe}(\text{CO})_4(\text{PCl}_3)$
4. ✘ $\text{Fe}(\text{CO})_4(\text{Pme}_3)$

Question Number : 5 Question Id : 59425312139 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 interhalogen compound is a gas at room temperature?

Options :

1. ✘ ICl
2. ✘ BrF_3
3. ✘ IF_5
4. ✔ ClF_5

Question Number : 6 Question Id : 59425312140 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 transition metal complex has the highest spin-only magnetic moment value?

Options :

1. ✓ $[\text{Mn F}_6]^{4-}$
2. ✗ $[\text{Fe (CN)}_6]^{3-}$
3. ✗ $[\text{Co (NH}_3)_6]^{3+}$
4. ✗ $[\text{Ni (H}_2\text{O)}_6]^{2+}$

Question Number : 7 Question Id : 59425312141 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 actinide ions in aqueous solution is red colored?

Options :

1. ✗ Ac^{3+}
2. ✗ Th^{4+}

3. ✘ Pa^{4+}

4. ✔ U^{3+}

Question Number : 8 Question Id : 59425312142 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 set of statements regarding lanthanides and actinides and choose the correct answer.

- A) The elements of lanthanides and actinides show +3 oxidation state
- B) Like Lanthanide contraction, actinide contraction is seen in actinides
- C) Most of the lanthanide and actinide cations are diamagnetic
- D) The nitrates, perchlorates of trivalent actinides and lanthanides are soluble in water

Options :

1. ✘ A and B only

2. ✘ C and D only

3. ✔ A, B and D only

4. ✘ A, B and C only

Question Number : 9 Question Id : 59425312143 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 following structures of boranes to the formulae and choose the correct answer:

Structure of boranes	Formula
A) closo	i) $B_n H_{n+8}$
B) nido	ii) $[B_n H_n]^{2-}$
C) archno	iii) $B_n H_{n+4}$
D) hypho	iv) $B_n H_{n+6}$

Options :

1. ✘ A – iv; B – i; C – iii; D – ii

2. ✘ A – iv; B – ii; C – i; D – iii

3. ✘ A – ii; B – iii; C – i; D – iv

4. ✔ A – ii; B – iii; C – iv; D – i

Question Number : 10 Question Id : 59425312144 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 following compounds with their use and choose the correct answer

Compound	Use
A) Gallium arsenide	i) Super conductor
B) Magnesium diboride	ii) Conductor
C) Boron nitride	iii) Explosive
D) Graphite	iv) Semiconductor
	v) Thermal Insulator

Options :

1. ✓ A – iv; B – i; C – v; D – ii
2. ✗ A – iv; B – v; C – i; D – ii
3. ✗ A – ii; B – iii; C – i; D – iv
4. ✗ A – ii; B – iii; C – iv; D – i

Question Number : 11 Question Id : 59425312145 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

Lewis acidity of silicon tetrahalides increases in the order:

Options :

1. ✗ $\text{SiF}_4 < \text{SiCl}_4 < \text{SiBr}_4 < \text{SiI}_4$
2. ✗ $\text{SiCl}_4 < \text{SiBr}_4 < \text{SiF}_4 < \text{SiI}_4$
3. ✗ $\text{SiBr}_4 < \text{SiF}_4 < \text{SiCl}_4 < \text{SiI}_4$
4. ✓ $\text{SiI}_4 < \text{SiBr}_4 < \text{SiCl}_4 < \text{SiF}_4$

Question Number : 12 Question Id : 59425312146 Question Type : MCQ Option Shuffling : Yes

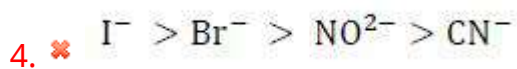
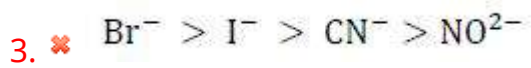
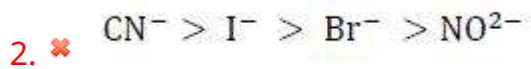
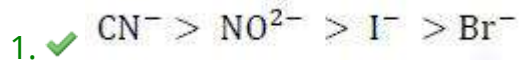
Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

The trans effect of Pt(II) complexes decrease in the following order:

Options :



Question Number : 13 Question Id : 59425312147 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 a NON-heme protein?

Options :

1. ✗ Hemoglobin

2. ✓ Hemocyanin

3. ✗ Myoglobin

4. ✖ Cytocrome p-450

Question Number : 14 Question Id : 59425312148 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 and choose your answer for the correct set of statements.

- A) In the capillary gas chromatography, the chromatographic peak broadening is only due to Eddy diffusion
- B) In the capillary gas chromatography, the chromatographic peak broadening is due to molecular diffusion and resistance to mass transfer
- C) In gas chromatography, oxygen and carbon dioxide are used as carrier gases
- D) In gas chromatography, hydrogen and nitrogen are used as carrier gases

Options :

1. ✖ A and C only

2. ✖ A and D only

3. ✔ B and D only

4. ✖ B and C only

Question Number : 15 Question Id : 59425312149 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

Predict the order of elution (shortest retention time to longest retention time) from a conventional liquid-solid chromatography column containing the following compounds mixture.

$\text{CH}_3\text{CH}_2\text{CH}_3$, $\text{CH}_3\text{CH}_2\text{COOH}$, $\text{CH}_3\text{CH}=\text{CH}_2$ and $\text{CH}_3\text{CH}_2\text{CH}_2\text{Cl}$

Options :

1. ✘ $\text{CH}_3\text{CH}=\text{CH}_2 < \text{CH}_3\text{CH}_2\text{CH}_2\text{Cl} < \text{CH}_3\text{CH}_2\text{COOH} < \text{CH}_3\text{CH}_2\text{CH}_3$
2. ✔ $\text{CH}_3\text{CH}_2\text{CH}_3 < \text{CH}_3\text{CH}=\text{CH}_2 < \text{CH}_3\text{CH}_2\text{CH}_2\text{Cl} < \text{CH}_3\text{CH}_2\text{COOH}$
3. ✘ $\text{CH}_3\text{CH}_2\text{COOH} < \text{CH}_3\text{CH}=\text{CH}_2 < \text{CH}_3\text{CH}_2\text{CH}_2\text{Cl} < \text{CH}_3\text{CH}_2\text{CH}_3$
4. ✘ $\text{CH}_3\text{CH}_2\text{CH}_2\text{Cl} < \text{CH}_3\text{CH}_2\text{CH}_3 < \text{CH}_3\text{CH}=\text{CH}_2 < \text{CH}_3\text{CH}_2\text{COOH}$

Question Number : 16 Question Id : 59425312150 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

Predict the geometry of XeF_5^- using VSEPR theory:

Options :

1. ✘ Trigonal bipyramidal
2. ✔ Pentagonal planar
3. ✘ Pentagonal pyramidal
4. ✘ Square pyramidal

Question Number : 17 Question Id : 59425312151 Question Type : MCQ Option Shuffling : Yes

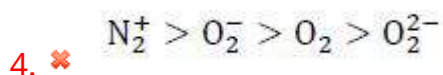
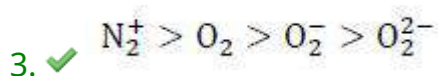
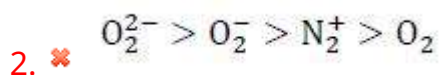
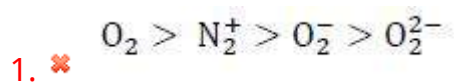
Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

The bond order of the species N_2^+ , O_2 , O_2^- and O_2^{2-} decreases respectively in the following order:

Options :



Question Number : 18 Question Id : 59425312152 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 number of geometric isomers only possible for the complex $[Cr(NH_3)_2(H_2O)_2Br_2]^+$ is:

Options :



2. ✓ 5

3. ✗ 6

4. ✗ 7

Question Number : 19 Question Id : 59425312153 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 titanium tetrahalides is colorless and has lowest melting point?

Options :

1. ✗ TiF_4

2. ✓ TiCl_4

3. ✗ TiBr_4

4. ✗ TiI_4

Question Number : 20 Question Id : 59425312154 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 nitrosyl complex is isoelectronic?

Options :

1. ✘ $\text{Mn}(\text{CO})_4\text{NO}$
2. ✘ $[(\eta^5\text{-C}_5\text{H}_5)\text{Fe}(\text{CO})_2(\text{NO})_2]$
3. ✘ $[\text{Co}(\text{CO})_3\text{NO}]$
4. ✔ $[\text{Cr}(\text{NO})_4]$

Question Number : 21 Question Id : 59425312155 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 following enzymes to their metal centers and choose the correct answer:

- | | |
|-----------------------------|---------|
| A) Cytochrome p-450 | i) Cu |
| B) Hemocyanin | ii) Co |
| C) Carbonic anhydrase | iii) Fe |
| D) Ribonucleotide reductase | iv) Zn |

Options :

1. ✔ A – iii; B – i; C – iv; D – ii
2. ✘ A – iv; B – ii; C – i; D – iii
3. ✘ A – iii; B – ii; C – i; D – iv

4. ✘ A – iv; B – iii; C – i; D – ii

Question Number : 22 Question Id : 59425312156 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 oxyhemoglobin, the Fe(II) is in the following form:

Options :

1. ✘ High-spin state and paramagnetic

2. ✘ High-spin state and ferromagnetic

3. ✘ Low-spin state and paramagnetic

4. ✔ Low-spin state and diamagnetic

Question Number : 23 Question Id : 59425312157 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

For the compound ferrocene, which set of the following statements are correct?

- A) It is in orange color and more reactive than benzene towards electrophilic reagents
- B) It is diamagnetic and easily oxidises to paramagnetic blue ferrocenium ion
- C) It is in eclipsed form in solid phase and staggered form in gas phase
- D) It undergoes Friedel Crafts alkylation and acylation reactions

Options :

- 1. ✘ A and B only
- 2. ✘ C and D only
- 3. ✘ A, B and C only
- 4. ✔ A, B and D only

**Question Number : 24 Question Id : 59425312158 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 following in relation to froth flotation process and choose the correct answer.

- | | |
|---------------|------------------------|
| A) Collector | i) Aniline |
| B) Stabilizer | ii) NaCN |
| C) Depressant | iii) CuSO ₄ |
| D) Activator | iv) Pine oil |

Options :

- 1. ✘ A – ii; B – iii; C – i; D – iv

2. ✘ A – i; B – ii; C – iii; D – iv

3. ✘ A – ii; B – iv; C – i; D – iii

4. ✔ A – iv; B – i; C – ii; D – iii

Question Number : 25 Question Id : 59425312159 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 lowest M-C bond length is observed in the following metallocenes.

Options :

1. ✘ $[\text{Ni}(\eta^5\text{-cp})_2]$

2. ✘ $[\text{V}(\eta^5\text{-cp})_2]$

3. ✔ $[\text{Fe}(\eta^5\text{-cp})_2]$

4. ✘ $[\text{Cr}(\eta^5\text{-cp})_2]$

Question Number : 26 Question Id : 59425312160 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 isoelectronic complexes $[\text{V}(\text{CO})_6]^-$, $\text{Cr}(\text{CO})_6$ and $[\text{Mn}(\text{CO})_6]^+$ exhibit Metal - ligand charge transfer spectra. The increasing order of energy of complexes is:

Options :

1. ✓ $[\text{V}(\text{CO})_6]^- < \text{Cr}(\text{CO})_6 < [\text{Mn}(\text{CO})_6]^+$
2. ✗ $[\text{V}(\text{CO})_6]^- < [\text{Mn}(\text{CO})_6]^+ < \text{Cr}(\text{CO})_6$
3. ✗ $\text{Cr}(\text{CO})_6 < [\text{Mn}(\text{CO})_6]^+ < [\text{V}(\text{CO})_6]^-$
4. ✗ $[\text{Mn}(\text{CO})_6]^+ < [\text{V}(\text{CO})_6]^- < \text{Cr}(\text{CO})_6$

Question Number : 27 Question Id : 59425312161 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

Among the following cobalt complexes, the rate of aquation is highest in:

Options :

1. ✓ $[\text{Co}(\text{NH}_3)_5\text{I}]^{2+}$
2. ✗ $[\text{Co}(\text{NH}_3)_5\text{Cl}]^{2+}$
3. ✗ $[\text{Co}(\text{NH}_3)_5\text{SCN}]^{2+}$
4. ✗ $[\text{Co}(\text{NH}_3)_5\text{NO}_2]^{2+}$

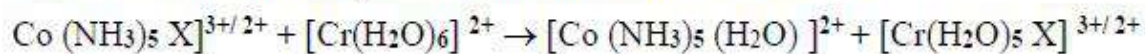
Question Number : 28 Question Id : 59425312162 Question Type : MCQ Option Shuffling : Yes

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 rate of the following redox reaction is slowest when X is:



Options :

1. ✘ N_3^-

2. ✘ Cl^-

3. ✔ NH_3

4. ✘ H_2O

Question Number : 29 Question Id : 59425312163 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 following purification processes to the suitable metal and choose the correct answer.

Method of purification	Metal
A) Vapour phase refining	i) Ge
B) Cupellation	ii) Hg
C) Poling	iii) Ag
D) Zone refining	iv) Ti
E) Distillation	v) Cu (Blister)

Options :

1. ✘ A – iv; B – v; C – iii; D – i; E – ii

2. ✘ A – ii; B – iv; C – iii; D – v; E – i

3. ✔ A – iv; B – iii; C – v; D – i; E – ii

4. ✘ A – i; B – iv; C – ii; D – iii; E – v

Question Number : 30 Question Id : 59425312164 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 following Acids and Bases based on Pearson's classification and choose the correct answer.

A) Hard Acid	i) Tl^+
B) Hard Base	ii) CN^-
C) Soft Acid	iii) Al^{3+}
D) Soft Base	iv) ClO_4^-

Options :

1. ✘ A – i; B – iii; C – iv; D – ii
2. ✔ A – iii; B – iv; C – i; D – ii
3. ✘ A – iii; B – i; C – ii; D – iv
4. ✘ A – i; B – iv; C – iii; D – ii

**Question Number : 31 Question Id : 59425312165 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 statement is true for osmosis phenomenon?

Options :

1. ✘ Solute molecules pass through semi permeable membrane into solvent
2. ✔ Solvent molecules pass through semi permeable membrane into solution
3. ✘ Migration of solvent molecules through semipermeable membrane takes place to increase solute concentration
4. ✘ Both solvent and solute molecules get exchanged through membrane

**Question Number : 32 Question Id : 59425312166 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

Colligative properties of a non-electrolytic solution depend on:

Options :

1. ✘ Size, mass and number of solute particles
2. ✘ Mass and number of solute particles only
3. ✘ Size and mass of solute particles only
4. ✔ Number of solute particles only

Question Number : 33 Question Id : 59425312167 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 pair of the following closed packed structures has same packing efficiency?

Options :

1. ✔ Face centered cubic close packing and Hexagonal close packing
2. ✘ Hexagonal close packing and Body centered close packing
3. ✘ Body centered close packing and Simple cubic packing
4. ✘

Face centered close packing and Simple cubic packing

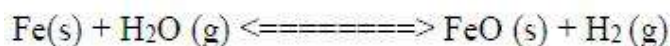
Question Number : 34 Question Id : 59425312168 Question Type : MCQ Option Shuffling : Yes

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

For the system represented by the equation:



Following are degrees of freedom, number of phases and number of components:

Options :

1. ✘ 2, 2 and 4

2. ✘ 3, 2 and 4

3. ✘ 2, 4 and 4

4. ✔ 2, 3 and 3

Question Number : 35 Question Id : 59425312169 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 ionic strength of a solution obtained by mixing 50 mL of 0.2 M KCl and 50 mL of 0.1 M $\text{Cu}(\text{NO}_3)_2$?

Options :

1. ✘ 0.15

2. ✓ 0.25

3. ✗ 0.30

4. ✗ 0.50

Question Number : 36 Question Id : 59425312170 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 pH of weak acid of 0.01 M concentration having dissociation constant, 10^{-6} M at 298 K is

Options :

1. ✗ 3

2. ✓ 4

3. ✗ 5

4. ✗ 6

Question Number : 37 Question Id : 59425312171 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

50 mL of 0.2 M HCl is mixed with 100 mL of 0.25 M NaOH. Following is the pH of the resulting solution:

Options :

1. ✓ 13

2. ✗ 7

3. ✗ 1

4. ✗ 0.1

Question Number : 38 Question Id : 59425312172 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 order of energy of electronic transition?

Options :

1. ✓ $n - \pi^* < \pi - \pi^* < n - \sigma^* < \sigma - \sigma^*$

2. ✗ $\sigma - \sigma^* < \pi - \pi^* < n - \sigma^* < n - \pi^*$

3. ✗ $\pi - \pi^* < n - \sigma^* < n - \pi^* \ll \sigma - \sigma^*$

4. ✗ $\sigma - \sigma^* < n - \sigma^* < n - \pi^* < \pi - \pi^*$

Question Number : 39 Question Id : 59425312173 Question Type : MCQ Option Shuffling : Yes

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

Minimum Instruction Time : 0

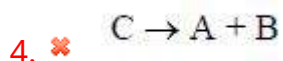
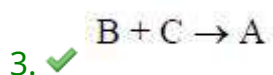
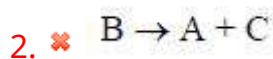
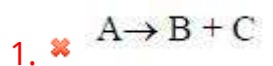
Correct Marks : 1 Wrong Marks : 0.25

The heats of formation (ΔH_f^0) and entropies S^0 of compounds A, B and C at 300 K and 1 atm pressure are given in the following Table:

Comp/Data	A	B	C
ΔH_f^0 (kJ mol ⁻¹)	50	60	70
S^0 (J K ⁻¹ mol ⁻¹)	10	20	30

Using the above data predict the spontaneous reaction among the following at 300 K and 1 atm pressure?

Options :



Question Number : 40 Question Id : 59425312174 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 correct answer from the alternatives given by identifying the state functions among the thermodynamic quantities given below.

- A) q/w
- B) q_p
- C) $\Delta H/T$
- D) $q - w$

Options :

1. ✘ A, B and C only

2. ✔ B, C and D only

3. ✘ A, C and D only

4. ✘ C and D only

Question Number : 41 Question Id : 59425312175 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 IR spectral band is observed at 3000 cm^{-1} due to the stretching of bond between two atoms whose reduced mass (μ), is given as $4\pi^2\mu = 10^{-26} \text{ kg}$. The force constant K, for the bond is (consider light velocity as $3 \times 10^8 \text{ ms}^{-1}$)

Options :

1. ✘ 3 Nm^{-1}

2. ✘ 9 Nm^{-1}

3. ✘ 12 Nm^{-1}

4. ✔ 81 Nm^{-1}

Question Number : 42 Question Id : 59425312176 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

Following are equations for the free energy change. Consider usual symbols for the quantities:

A) $\Delta G^0 = -RT \ln K$

B) $\Delta G = \Delta H + T [\delta (\Delta G) / \delta T]_p$

C) $\Delta G^0 = -nFE^0$

D) $\Delta G^0 = \Delta H^0 + T\Delta S^0$

Which one among the alternatives given below represent the correctness of the Equations?

Options :

1. ✔ A, B and C only

2. ✘ B, C and D only

3. ✘ A, B and D only

4. ✘ B and C only

Question Number : 43 Question Id : 59425312177 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 statements pertain to the chemical potential. Identify the correct set of statements for chemical potential and choose the correct answer.

- A) For pure substances, it is same as the molar Gibbs free energy
- B) For a substance in a mixture, it is same as partial molar volume
- C) It is change in Gibbs free energy with respect to amount of substance at constant temperature and pressure
- D) For a given component of a thermodynamic system in a given phase it is a thermodynamic state function
- E) For a given component in a system of more than one component, it is equal to the change in Gibbs free energy of the pure material

Options :

1. ✓ A, C and D only

2. ✗ B, C and E only

3. ✗ A, B and C only

4. ✗ B, D and E only

Question Number : 44 Question Id : 59425312178 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

50 moles % of ortho-hydrogen and 50 mole % of para-hydrogen are mixed at constant temperature and atmospheric pressure. Which of the following is true for the process?

Options :

1. ✘ Randomness will decrease and entropy will decrease
2. ✘ Randomness will decrease and entropy will increase
3. ✔ Randomness will increase and entropy will increase
4. ✘ Randomness will increase and entropy will decrease

**Question Number : 45 Question Id : 59425312179 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 ionic conductances of hydronium ion and acetate ion at infinite dilution are respectively given as 350 and 40 mhos cm^2 at 298 K. The equivalent conductance of 0.1 M acetic acid solution at the same temperature is measured as 3.9 mhos $\text{cm}^2 \text{equiv}^{-1}$. The degree of dissociation of acetic acid is:

Options :

1. ✘ 0.1
2. ✔ 0.01
3. ✘ 0.001
4. ✘ 0.0001

Question Number : 46 Question Id : 59425312180 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. ✘ Specific conductance of electrolytic solutions decreases with dilution
2. ✘ Molar ionic conductivity of H^+ at infinite dilution is the highest among all ions
3. ✘ Molar conductivity of electrolytic solutions decreases as the concentration is increased
4. ✔ Molar conductivity of electrolytic solutions increases as the concentration is increased

Question Number : 47 Question Id : 59425312181 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

Activity of the solution of $Zn(NO_3)_2$, in terms of its mean activity coefficient (γ_{\pm}) and its molality (m) is equal to the following:

Options :

1. ✘ $\gamma_{\pm}^2 m^2$
2. ✘ $2 \gamma_{\pm}^2 m^2$

3. ✘ $2 \gamma_{\pm}^3 m^3$

4. ✔ $4 \gamma_{\pm}^3 m^3$

Question Number : 48 Question Id : 59425312182 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 following and choose the correct answer:

- | | |
|------------------------------------|--|
| A) Gibbs –Helmholtz equation | i) Relates EMF of an electrochemical cell with concentration of the species involved in the cell reaction |
| B) Stern Volmer equation | ii) Relates free energy change with enthalpy change and temperature coefficient of free energy change at constant pressure |
| C) Nernst equation | iii) Relates molar conductance and magnitudes of asymmetry and electrophoretic effects of strong electrolytes |
| D) Debye – Huckel-Onsager equation | iv) Relates fluorescence quenching to the concentration of the quenching substance and the fluorescence lifetime |

Options :

1. ✘ A – ii; B – i; C – iv; D – iii

2. ✘ A – iii; B – ii; C – i; D – iv

3. ✔ A – ii; B – iv; C – i; D – iii

4. ✘ A – i; B – iv; C – iii; D – ii

Question Number : 49 Question Id : 59425312183 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 represent mathematical form of Heisenberg's uncertainty principle?

Options :

1. ✘ $\frac{h}{4\pi} \geq (\Delta x) (\Delta p)$

2. ✔ $\frac{h}{4\pi} \leq (\Delta x) (\Delta p)$

3. ✘ $\frac{h}{4\pi} > (\Delta x) (\Delta p)$

4. ✘ $\frac{h}{4\pi} = (\Delta x) (\Delta p)$

Question Number : 50 Question Id : 59425312184 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

de Broglie wavelength associated with a particle of 10 g having a velocity of 10 ms^{-1} (h is the Plank's constant):

Options :

1. ✘ $10^{-2} h$

2. ✘ $1 h$

3. ✓ 10 h

4. ✘ 10^2 h

Question Number : 51 Question Id : 59425312185 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 set of statements are true according to Langevin's theory of paramagnetism?

- A) Each atom behaves like a magnet with a magnetic momentum μ
- B) In the absence of the field, the magnetic momentum of individual atoms are randomly oriented as a result of thermal agitation
- C) There is interaction between individual magnetic moments
- D) Each magnetic momentum can interact independently with the external magnetic field

Options :

1. ✘ A and B only

2. ✘ C and D only

3. ✘ A, B and C only

4. ✓ A, B and D only

Question Number : 52 Question Id : 59425312186 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 reaction between ions of opposite charge in solution, formation of activated complex is associated with:

Options :

1. ✓ Gain of entropy

2. ✗ Loss of entropy

3. ✗ No change in entropy

4. ✗ Entropy change can't be predicted

Question Number : 53 Question Id : 59425312187 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

For a reaction in solution, greater solvation of an activated complex in comparison to reactants results in:

Options :

1. ✗ Decrease in the rate of reaction

2. ✓ Increase in the rate of reaction

3. ✘ Increase in the potential energy of activated complex

4. ✘ Increase in the activity coefficient of activated complex

Question Number : 54 Question Id : 59425312188 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

According to the steady state principle:

Options :

1. ✘ There will be steady decrease in intermediate concentration

2. ✘ There will be steady increase in intermediate concentration

3. ✔ Change in concentration of intermediate is zero

4. ✘ Concentration of intermediate is zero

Question Number : 55 Question Id : 59425312189 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

Following are statements relating to theories of reaction rates:

- A) Collision theory of reaction rates ignores orientation of reacting molecules
- B) Steric factor introduced in collision theory can be accurately calculated
- C) Transition state theory treats activated complex as having its own thermodynamic quantities
- D) Transition state theory takes into account molecular orientations necessary to promote a reaction

Choose the correct answer pertaining to the above statements:

Options :

- 1. ✘ A and D only
- 2. ✘ C and D only
- 3. ✘ A, B and C only
- 4. ✔ A, C and D only

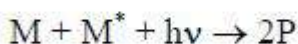
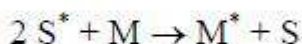
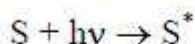
Question Number : 56 Question Id : 59425312190 Question Type : MCQ Option Shuffling : Yes

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 photochemical reaction happens through the following mechanism.



The quantum yield for the production of P is:

Options :

- 1. ✘ 0.667

2. ✘ 1.500

3. ✔ 0.333

4. ✘ 1.000

Question Number : 57 Question Id : 59425312191 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

Consider the following radiative and non-radiative processes:

- A) Phosphorescence
- B) Internal crossing
- C) Fluorescence
- D) Intersystem crossing

Choose the correct set of radiative processes among the alternatives given below:

Options :

1. ✘ A and B only

2. ✘ C and D only

3. ✔ A and C only

4. ✘ A, B and C only

Question Number : 58 Question Id : 59425312192 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 following.

- | | |
|---------------------------|------------------------|
| A) Photoconductor | i) Gallium phosphide |
| B) Compound semiconductor | ii) Grey tin |
| C) Semiconductor | iii) White tin |
| D) Metallic conductor | iv) Amorphous selenium |

Choose the correct answer:

Options :

1. ✓ A – iv; B – i; C – ii; D – iii

2. ✗ A – i; B – iv; C – ii; D – iii

3. ✗ A – iii; B – ii; C – i; D – iv

4. ✗ A – iv; B – iii; C – i; D – ii

Question Number : 59 Question Id : 59425312193 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

Consider the following statements and choose the correct set of statements:

- A) Silicon doped with Boron gives n-type semiconductor, while its doping with phosphorous gives p-type semiconductor
- B) Silicon doped with Boron gives p-type semiconductor, while its doping with phosphorous gives n-type semiconductor
- C) Density of ionic solids decreases due to Schottky defect while it remains same in Frenkel defect
- D) Density of ionic solids decreases due to Frenkel defect while it remains same in Schottky

Options :

1. ✘ A and C only

2. ✔ B and C only

3. ✘ B and D only

4. ✘ A and D only

Question Number : 60 Question Id : 59425312194 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 following molecules in the first column with their respective number of vibrational degrees of freedom given in the second column and choose the correct answer.

- | | |
|-------------|--------|
| A) C_2H_2 | i) 1 |
| B) H_2S | ii) 3 |
| C) HCl | iii) 6 |
| D) H_2O_2 | iv) 7 |

Options :

1. ✘ A – i; B – iv; C – ii; D – iii

2. ✔ A – iv; B – ii; C – i; D – iii

3. ✘ A – iii; B – ii; C – i; D – iv

4. ✘ A – iv; B – iii; C – i; D – ii

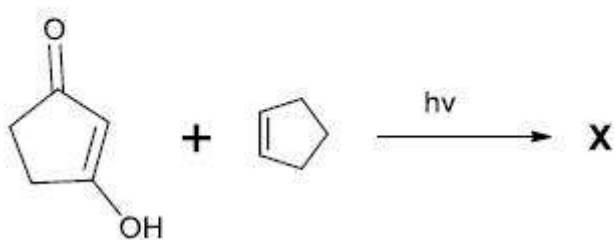
Question Number : 61 Question Id : 59425312195 Question Type : MCQ Option Shuffling : Yes

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

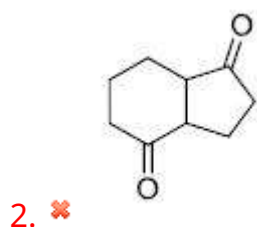
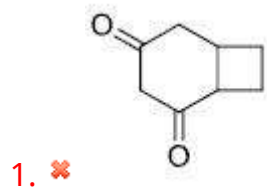
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Correct Marks : 1 Wrong Marks : 0.25

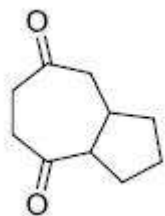
In the reaction given below, the product X is:



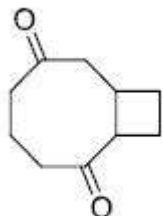
Options :



3. ✓



4. ✗



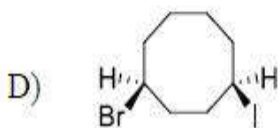
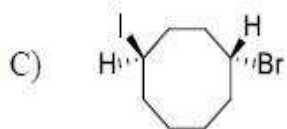
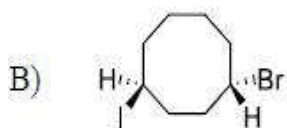
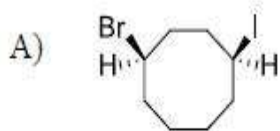
Question Number : 62 Question Id : 59425312196 Question Type : MCQ Option Shuffling : Yes

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 pair of enantiomers among the following structures and choose the correct answer.



Options :

1. ✗

A + B and C + D

2. ✓ A + D and B + C

3. ✗ A + C and B + D

4. ✗ A and D only

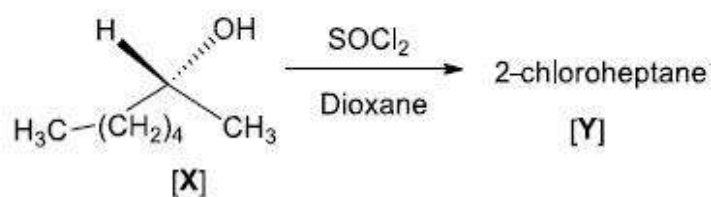
Question Number : 63 Question Id : 59425312197 Question Type : MCQ Option Shuffling : Yes

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

Consider the reaction given below and choose the correct statement among the alternatives provided.



Options :

1. ✓ Both X and Y are R-isomers

2. ✗ Both X and Y are S-isomers

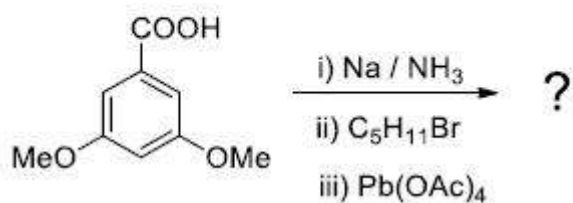
3. ✗ X is R-isomer and Y is S-isomer

4. ✗ X is S-isomer and Y is R-isomer

Question Number : 64 Question Id : 59425312198 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

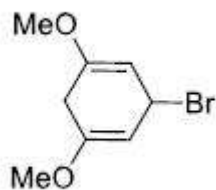
Identify the major product in the transformation given below:



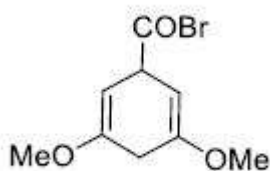
Options :



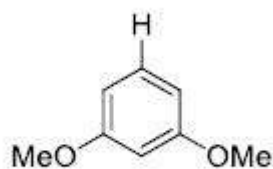
1. ✘



2. ✔



3. ✘

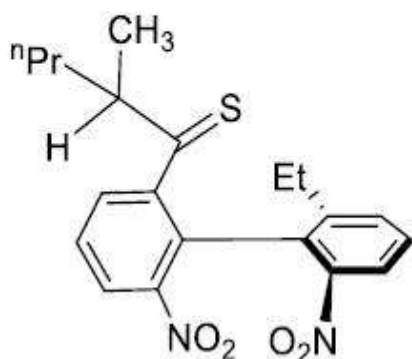


4. ✘

Question Number : 65 Question Id : 59425312199 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 highest number of stereoisomers possible for the following given biphenyl derivative is:



Options :

1. ✘ 8

2. ✘ 6

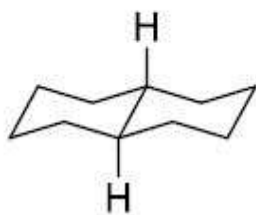
3. ✔ 4

4. ✘ 2

Question Number : 66 Question Id : 59425312200 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

Cis and trans decalins are dynamic stereoisomers. The ^1H NMR spectrum of the following form of decalin shows:



Options :

1. ✘ Only 3 peaks at δ 1.65 (s), δ 1.5 br (s) and 1.30 br (s)
2. ✔ Only 4 peaks at δ 1.70 (d), 1.60 (d), 1.25 (d) and 0.9 (m)
3. ✘ Only 2 peaks at δ 1.70 (d) and 1.30 (m)
4. ✘ Only one signal at δ 1.7 (s)

Question Number : 67 Question Id : 59425312201 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 unknown organic compound shows two types of peaks in the ratio of 1:2 in its PMR spectrum at δ -3.0 ppm and δ 9.0 ppm. The compound is:

Options :

1. ✔ [18] Annulene
2. ✘ [22] Annulene

3. ✘ [10] Annulene

4. ✘ [14] Annulene

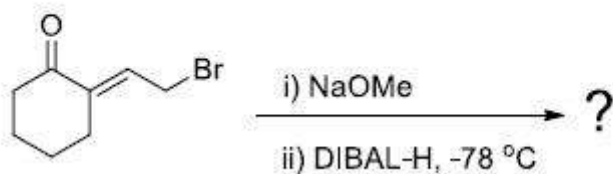
Question Number : 68 Question Id : 59425312202 Question Type : MCQ Option Shuffling : Yes

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

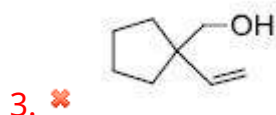
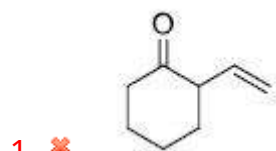
Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

The major product formed in the following reaction is:



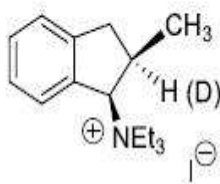
Options :



Question Number : 69 Question Id : 59425312203 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

Deuterium kinetic isotopic effect for the following compound was found to be 4.0. On the basis of this information, the predicted mechanism of the reaction is:



Options :

1. ✓ E₂
2. ✗ E₁
3. ✗ Free radical
4. ✗ E₁CB

Question Number : 70 Question Id : 59425312204 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 a suitable reagent to convert benzaldehyde into benzene?

Options :

1. ✗ DIBAL-H

2. ✘ BH_3

3. ✘ $\text{H}_2/\text{Pd-BaSO}_4$, Quinoline

4. ✔ $\text{H}_2/\text{Wilkinson's Catalyst}$

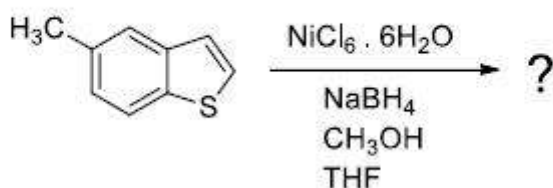
Question Number : 71 Question Id : 59425312205 Question Type : MCQ Option Shuffling : Yes

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

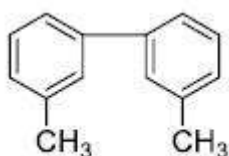
Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

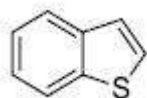
The product obtained in the following reaction is:



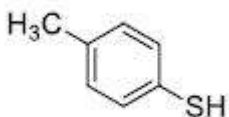
Options :



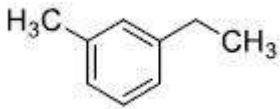
1. ✘



2. ✘



3. ✘



4. ✓

Question Number : 72 Question Id : 59425312206 Question Type : MCQ Option Shuffling : Yes

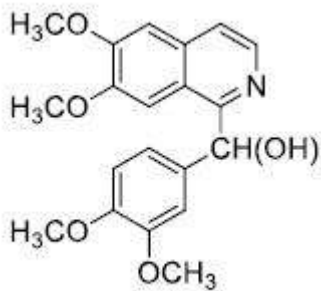
Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A

Minimum Instruction Time : 0

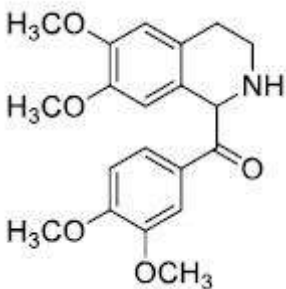
Correct Marks : 1 Wrong Marks : 0.25

Papaverine on oxidation with cold dil. KMnO_4 , followed by oxidation with hot dil. KMnO_4 and finally oxidation with hot KMnO_4 for a prolonged time gives the following product:

Options :

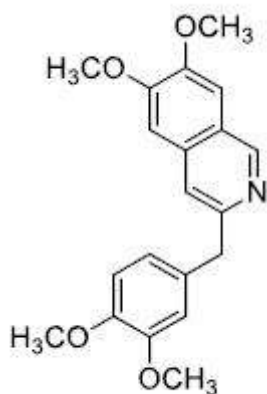
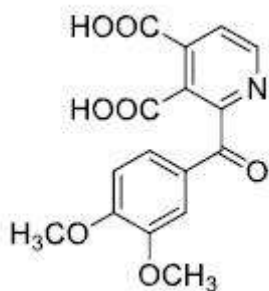


1. ✗



2. ✗

3. ✓



4. ✖

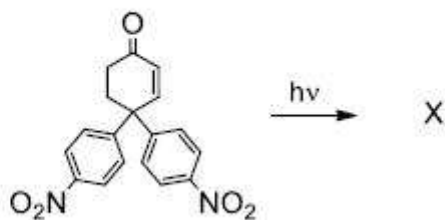
Question Number : 73 Question Id : 59425312207 Question Type : MCQ Option Shuffling : Yes

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

Minimum Instruction Time : 0

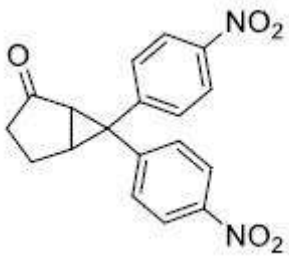
Correct Marks : 1 Wrong Marks : 0.25

The major product X obtained in the following photochemical reaction is:

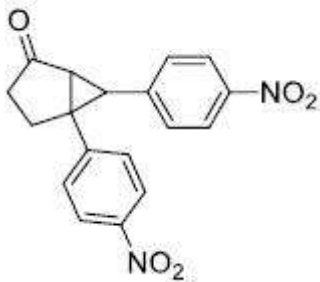


Options :

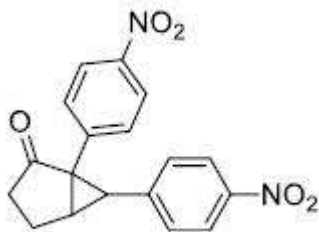
1. ✖



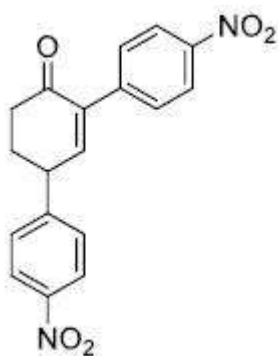
2. ✓



3. ✘



4. ✘



Question Number : 74 Question Id : 59425312208 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 500 MHz ^1H NMR spectrum, an organic compound exhibited a doublet. The two lines of the product are at δ 2.36 ppm and δ 2.38 ppm. The coupling constant value is:

Options :

1. ✘ 5 Hz

2. ✔ 10 Hz

3. ✘ 12 Hz

4. ✘ 100 Hz

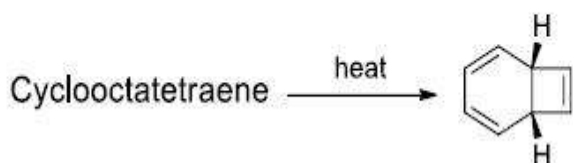
Question Number : 75 Question Id : 59425312209 Question Type : MCQ Option Shuffling : Yes

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 reaction given below, by which of the following method the product is formed?



Options :

1. ✔ 6π -disrotatory electrocyclisation

2. ✘ 4π -conrotatory electrocyclisation

3. ✘ 6π -conrotatory electrocyclisation

4. ✘ 4 π -disrotatory electrocycloisatation

Question Number : 76 Question Id : 59425312210 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

Among the twelve principles of Green chemistry, for which of the following principle, Biodiesel is an example?

Options :

1. ✘ Safer solvents

2. ✔ Use of renewable feed stocks

3. ✘ Waste prevention

4. ✘ Use of catalysis

Question Number : 77 Question Id : 59425312211 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 IUPAC name of the spiro compound is:



Options :

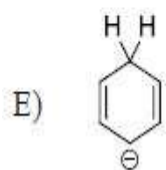
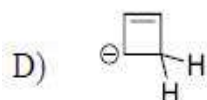
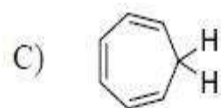
1.

- 1. ✘ 1-oxospiro[4, 3] octane
- 2. ✔ 5-oxospiro[3, 4] octane
- 3. ✘ 1-oxospiro [3, 4] octane
- 4. ✘ 5-oxospiro[4, 3] octane

Question Number : 78 Question Id : 59425312212 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

Among the species represented by structures A to E shown below, which are converted to an aromatic substance on loss of hydride ion?



Options :

- 1. ✔ B, C and E only

2. ✘ A, B and C only

3. ✘ C, D and E only

4. ✘ A, C and E only

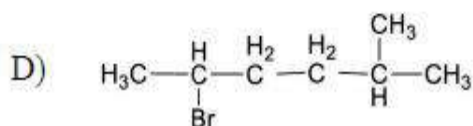
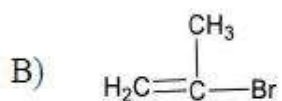
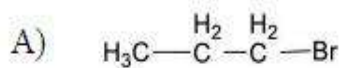
Question Number : 79 Question Id : 59425312213 Question Type : MCQ Option Shuffling : Yes

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

Arrange the following in decreasing order of rate of solvolysis with aqueous ethyl alcohol.



Options :

1. ✘ $A > C > B > D$

2. ✘ $B > A > D > C$

3.

✓ $C > D > A > B$

4. ✗ $C > A > B > D$

Question Number : 80 Question Id : 59425312214 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 following and choose the correct answer:

- | | |
|-------------------------|------------------------------------|
| A) Perkin condensation | i) β - hydroxy ester |
| B) Lossen rearrangement | ii) Nucleophilic ipso substitution |
| C) Reformatsky reaction | iii) Carboxylate as base |
| D) Smiles rearrangement | iv) Isocyanate |

Options :

1. ✗ A – iv; B – ii; C – iii; D – i

2. ✓ A – iii; B – iv; C – i; D – ii

3. ✗ A – iii; B – i; C – ii; D – iv

4. ✗ A – ii; B – i; C – iv; D – iii

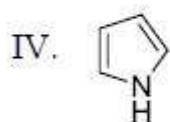
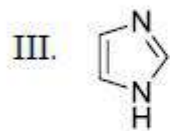
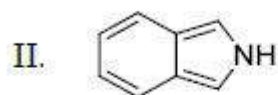
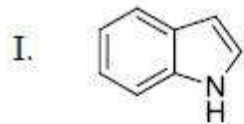
Question Number : 81 Question Id : 59425312215 Question Type : MCQ Option Shuffling : Yes

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 correct statements relating to the compounds given below:



- A) I is more stable than II
B) III is a more stronger base than IV
C) In structure III, —N=C double bond can be protonated
D) II, III and IV exist in tautomeric forms

Options :

1. ✘ A, B and D only

2. ✘ A and D only

3. ✘ A, C and D only

4. ✔ A, B and C only

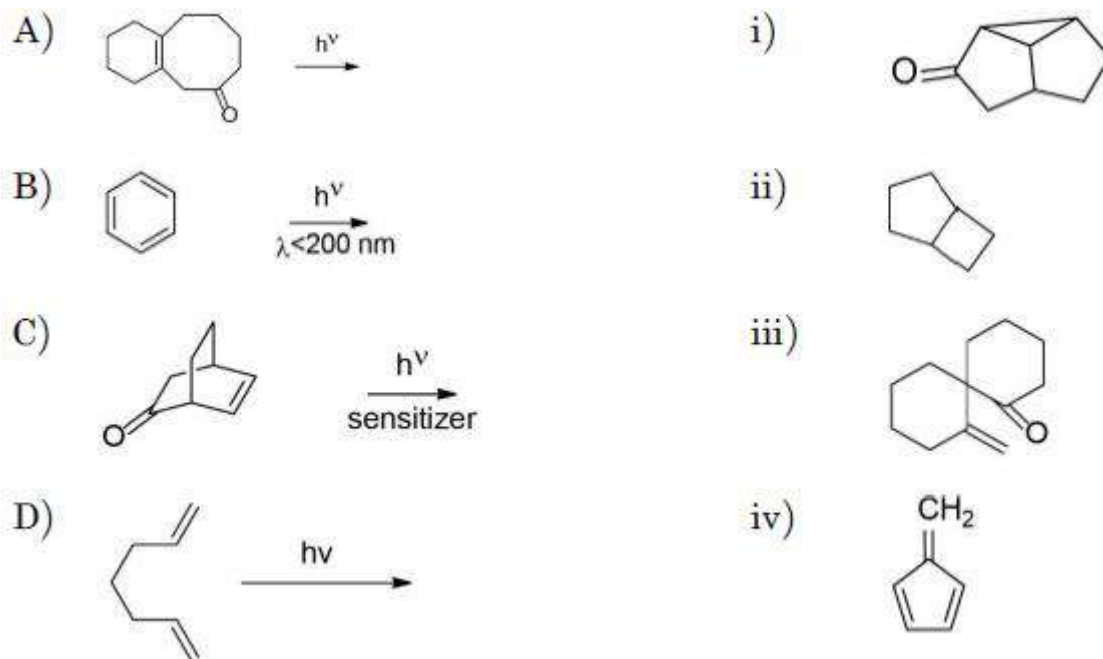
Question Number : 82 Question Id : 59425312216 Question Type : MCQ Option Shuffling : Yes

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 following and choose the correct answer:



Options :

1. ✓ A – iii; B – iv; C – i; D – ii

2. ✗ A – ii; B – i; C – iv; D – iii

3. ✗ A – iii; B – iv; C – ii; D – i

4. ✗ A – iv; B – ii; C – iii; D – i

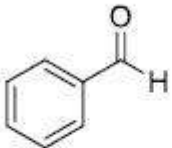
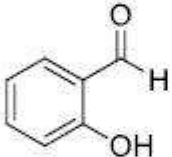
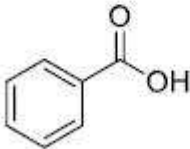
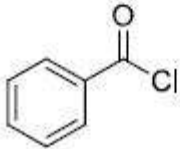
Question Number : 83 Question Id : 59425312217 Question Type : MCQ Option Shuffling : Yes

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 following and choose the correct answer:

Compound	^{13}C NMR Chemical shift (δ ppm) of carbonyl carbon
A) 	i) 192
B) 	ii) 168
C) 	iii) 196
D) 	iv) 172

Options :

1. ✘ A – iii; B – iv; C – ii; D – i

2. ✘ A – ii; B – i; C – iii; D – iv

3. ✔ A – i; B – iii; C – iv; D – ii

4. ✘ A – i; B – iv; C – iii; D – ii

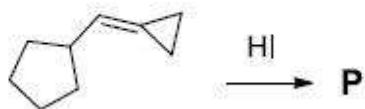
Question Number : 84 Question Id : 59425312218 Question Type : MCQ Option Shuffling : Yes

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

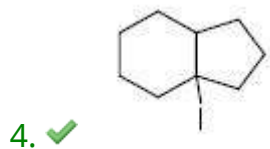
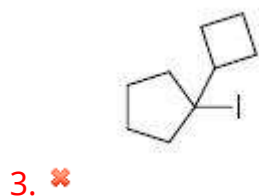
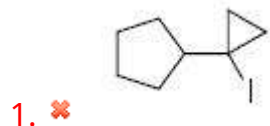
Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

In the reaction given below, which of the following compound is product 'P'?



Options :



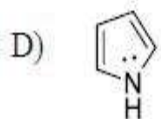
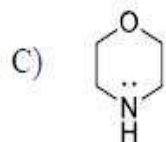
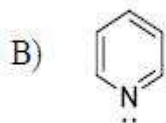
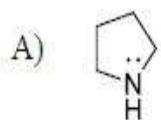
Question Number : 85 Question Id : 59425312219 Question Type : MCQ Option Shuffling : Yes

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

Among the Nitrogen heterocyclic compounds given below, the following is the correct order of basicity:



Options :

1. ✓ $A > C > B > D$

2. ✗ $D > A > B > C$

3. ✗ $A > C > D > B$

4. ✗ $B > C > D > A$

Question Number : 86 Question Id : 59425312220 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 following and choose the correct answer:

- A) 1, 3-diyne + Acetylene i) Carbene
- B)
$$\begin{array}{c} \text{CH}_3 \\ | \\ \text{H}_3\text{C}-\text{C}-\text{N}=\text{N}-\text{C}-\text{CH}_3 \\ | \qquad \qquad | \\ \text{CN} \qquad \qquad \text{CN} \end{array}$$
 ii) Unpaired electron species
- C) SN^2 iii) No intermediate
- D) $\text{CHBr}_3 + \text{NaOH}$ iv) Benzyne

Options :

1. ✓ A - iv; B - ii; C - iii; D - i

2. ✗ A - ii; B - iv; C - i; D - iii

3. ✗ A - iii; B - i; C - ii; D - iv

4. ✗ A - iv; B - i; C - ii; D - iii

Question Number : 87 Question Id : 59425312221 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

Consider the following statements. Which of the following is correct with respect to α -terpineol and camphor?

- A) 2-methyl 1, 3-butadiene reacts with methyl vinyl ketone to give intermediate. This on reaction with methyl magnesium bromide followed by hydrolysis gives α -terpineol
- B) From α -pinene, isobornyl acetate can be synthesized. This can be converted into camphor by reaction with NaOH followed by oxidation
- C) Treatment of α -terpineol with dil. H_2SO_4 gives p-Cymene and camphor forms mono oxime
- D) Camphor on distillation with iodine gives carvacrol

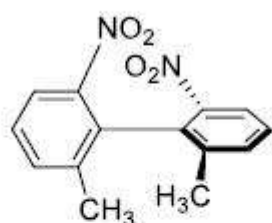
Options :

- 1. ✘ A and B only
- 2. ✘ A, B and C only
- 3. ✘ A and D only
- 4. ✔ A, B, C and D

**Question Number : 88 Question Id : 59425312222 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**

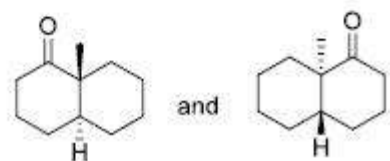
Match the following and select the correct answer:

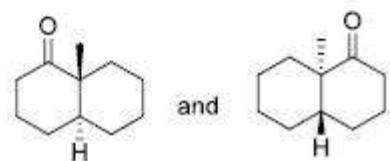
A)  i) Mesocompound



B) E-cyclooctene ii) Diastereomers

C) Cis-1,3-dimethyl cyclohexane iii) Chiral axis

D)  iv) Planar chirality



Options :

1. ✘ A – iii; B – i; C – ii; D – iv

2. ✘ A – iv; B – iii; C – ii; D – i

3. ✘ A – ii; B – iv; C – iii; D – i

4. ✔ A – iii; B – iv; C – i; D – ii

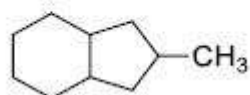
Question Number : 89 Question Id : 59425312223 Question Type : MCQ Option Shuffling : Yes

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

Systematic nomenclature of the following cycloalkane is:



Options :

1. ✘ 1-Methyl bicyclo [4, 3, 0] nonane
2. ✘ 8-Methyl bicyclo [0, 3, 4] nonane
3. ✔ 8-Methyl bicyclo [4, 3, 0] nonane
4. ✘ 3-Methyl bicyclo [0, 3, 4] nonane

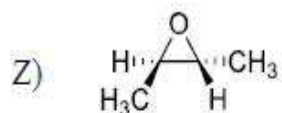
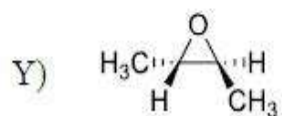
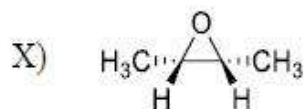
Question Number : 90 Question Id : 59425312224 Question Type : MCQ Option Shuffling : Yes

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

Statements regarding oxirane derivatives X, Y and Z are given below. Choose your answer for correct set of statements:



- A) X is cis isomer and is achiral
- B) Y and Z are trans isomers and are achiral
- C) Y and Z are non-superimposable enantiomers
- D) Y and Z are trans-isomers and are chiral molecules

Options :

1. ✔ A, C and D only

2. ✘ A, B and C only

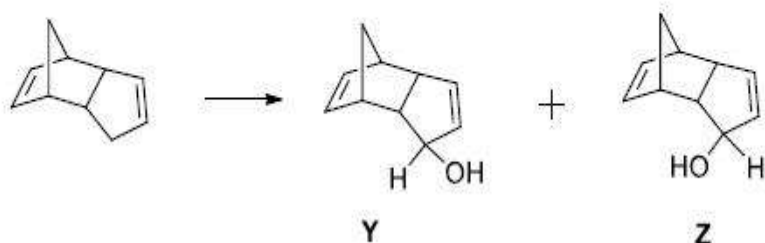
3. ✘ B and C only

4. ✘ C and D only

Question Number : 91 Question Id : 59425312225 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

For the following given allylic oxidation reaction, choose your answer for the correct statement.



Options :

1. ✘ Suitable reagent is OsO_4 and the major product is Y

2. ✘ Suitable reagent is OsO_4 and the major product is Z

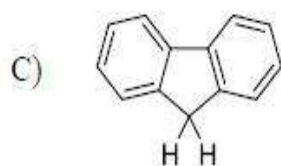
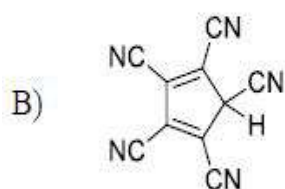
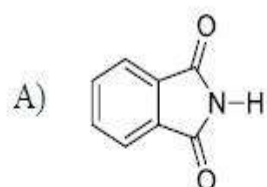
3. ✔ Suitable reagent is SeO_2 and the major product is Y

4. ✘ Suitable reagent is SeO_2 and the major product is Z

Question Number : 92 Question Id : 59425312226 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 order of pKa of the compounds A to C and nucleophilicity of the following anion is



and CH_3COO^- , CH_3O^- , $\text{C}_6\text{H}_5\text{O}^-$, NO_3^-

Options :

1. ✘ B > C > A and $\text{C}_6\text{H}_5\text{O}^- > \text{CH}_3\text{O}^- > \text{CH}_3\text{COO}^- > \text{NO}_3^-$

2. ✔ C > A > B and $\text{CH}_3\text{O}^- > \text{C}_6\text{H}_5\text{O}^- > \text{CH}_3\text{COO}^- > \text{NO}_3^-$

3. ✘ A > B > C and $\text{CH}_3\text{O}^- > \text{C}_6\text{H}_5\text{O}^- > \text{NO}_3^- > \text{CH}_3\text{COO}^-$

4. ✘ C > B > A and $\text{CH}_3\text{O}^- > \text{CH}_3\text{COO}^- > \text{C}_6\text{H}_5\text{O}^- > \text{NO}_3^-$

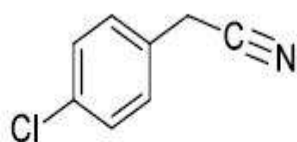
Question Number : 93 Question Id : 59425312227 Question Type : MCQ Option Shuffling : Yes

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

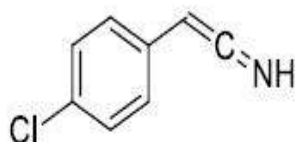
Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

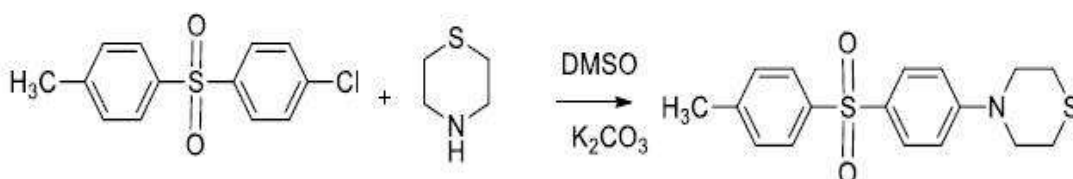
Consider the statements about structures of the compounds A and B and also the reaction given below and choose correct set of statements among the alternatives provided.



A



B



- i) A and B are resonance structures
- ii) A and B are tautomers
- iii) B is more basic than A
- iv) A is more basic than B

Options :

- 1. ✘ i, iii and aromatic ipso substitution and aromatic electrophilic substitution
- 2. ✘ iii and aromatic electrophilic substitution and aromatic free radical substitution
- 3. ✘ ii and iii and aromatic electrophilic substitution reaction
- 4. ✔ ii and iii and aromatic ipso substitution and aromatic nucleophilic substitution

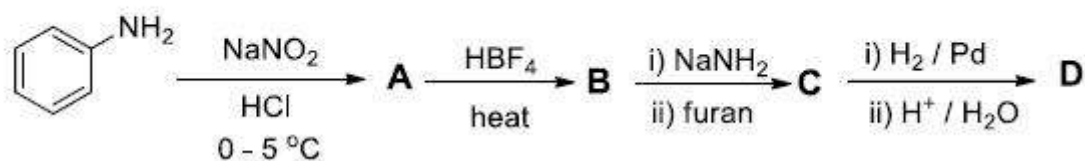
Question Number : 94 Question Id : 59425312228 Question Type : MCQ Option Shuffling : Yes

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

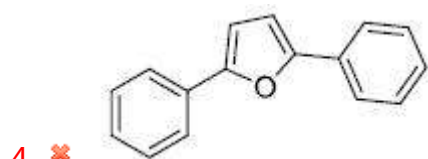
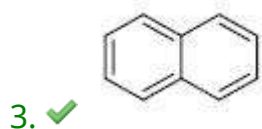
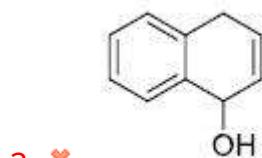
Minimum Instruction Time : 0

Correct Marks : 1 Wrong Marks : 0.25

In the following scheme of reactions the product D is



Options :



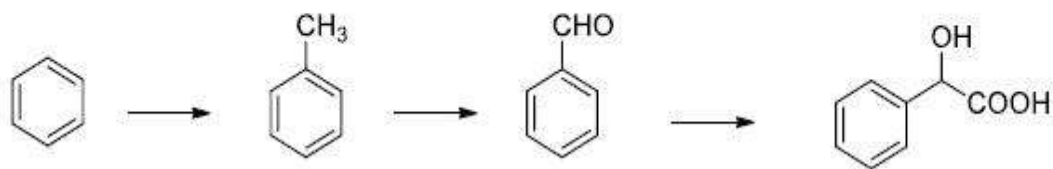
Question Number : 95 Question Id : 59425312229 Question Type : MCQ Option Shuffling : Yes

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 conditions in the following reactions



Options :

1. ✘ $\text{CH}_3\text{MgBr} / \text{H}_3\text{O}^+$, KMnO_4 , NaCN/HCl
2. ✘ $\text{CH}_3\text{Cl} / \text{AlCl}_3$, KMnO_4 , NaCN/HCl
3. ✘ $\text{CH}_3\text{Cl} / \text{AlCl}_3$, CrO_2Cl_2 , $[\text{Ph}_3\text{P}]_3\text{RhCl}$, C_6H_6 , heat
4. ✔ $\text{CH}_3\text{Cl} / \text{AlCl}_3$, CrO_2Cl_2 , NaCN / HCl

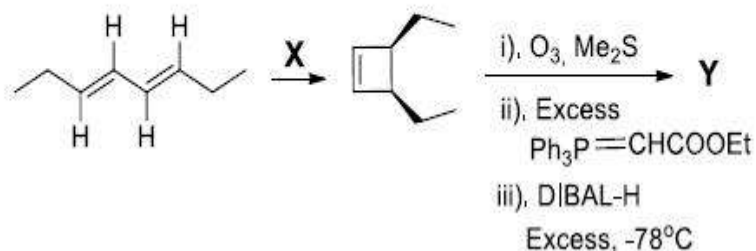
Question Number : 96 Question Id : 59425312230 Question Type : MCQ Option Shuffling : Yes

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

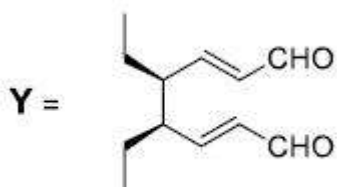
Predict the condition X and the structure of the major product Y in the following sequence:



Options :

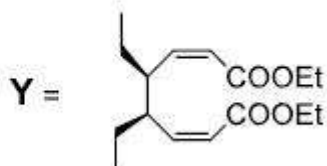
1. ✔

X = hv,



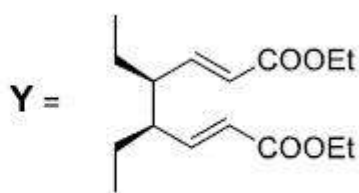
2. ✖

X = hv,



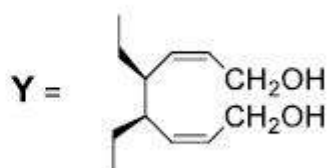
3. ✖

X = heat



4. ✖

X = heat



Question Number : 97 Question Id : 59425312231 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 conformer of 1, 2 - diiodo -1, 2 - dichloro ethane and 1, 4 - dimethyl cyclohexane is:

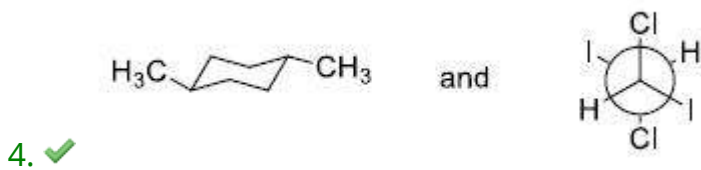
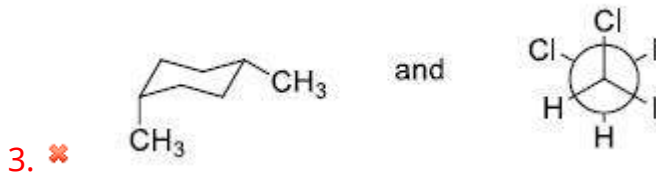
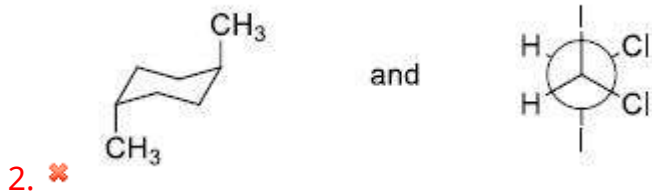
Options :



and



1. ✖



Question Number : 98 Question Id : 59425312232 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 non-toxic and green solvent is:

Options :

1. ✘ Benzene

2. ✘ CCl₄

3. ✔ Liquefied CO₂

4. ✘ Toluene

Question Number : 99 Question Id : 59425312233 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 correct order of stability of the different conformations of cyclohexane.

Options :

1. ✘ Chair > Boat > Twist boat

2. ✘ Boat > Twist boat > Chair

3. ✔ Chair > Twist boat > boat

4. ✘ Twist boat > boat > Chair

Question Number : 100 Question Id : 59425312234 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 and choose the correct set of statements:

- A) Hofmann rearrangement involves a primary amide and intermediate formed is isocyanide
- B) Hofmann rearrangement involves an acyclic azide
- C) Curtius rearrangement involves acyl azide and intermediate formed in the reaction is isocyanate
- D) Curtius rearrangement involves a primary amide and the reaction belongs to cyclization

Options :

1. ✘

A and D only

2. ✓ A and C only

3. ✗ B and C only

4. ✗ C and D only