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Previous Year Paper

18/07/2026



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NTA Joint CSIR UGC NET JUNE 2026_ 17th and 18th July

Application No	
Test Date	18/07/2026
Test Time	9:00 AM - 12:00 PM
Subject	Chemical Sciences

Section : PART A

Q.1 Divide Rs. 10,000 into two parts, so that simple interest on the first part for two years at 10% per annum may be equal to the simple interest on the second part for the five years at 1% per annum. Find the values of its two parts.

- 1. Rs. 5,000, Rs. 5,000
- 2. Rs. 7,000 Rs. 3,000
- 3. Rs. 8,000 Rs. 2,000
- 4. Rs. 6,000 Rs. 4,000

- Options 1. 1
- 2. 2
 - 3. 3
 - 4. 4

Question Type : MCQ

Question ID : 458908628

Option 1 ID : 4589082509

Option 2 ID : 4589082510

Option 3 ID : 4589082511

Option 4 ID : 4589082512

Status : Not Answered

Chosen Option : --

Q.2 The medicines are the most effective, if they are administered in the _____.

- 1. Gaseous state
- 2. Colloidal state
- 3. Solid state
- 4. Solution state

- Options 1. 1
- 2. 2
 - 3. 3
 - 4. 4

Question Type : MCQ

Question ID : 458908622

Option 1 ID : 4589082485

Option 2 ID : 4589082486

Option 3 ID : 4589082487

Option 4 ID : 4589082488

Status : Answered

Chosen Option : 4

Q.3

From the following two statements, which of the conclusions logically follows.

(Assuming the statements are correct, even if they seem to be at variance with the commonly known facts)

Statement : All owls are parrots.

Some parrots are crows.

Conclusion : (I) No owl is crow.

(II) All parrots are owls.

(III) Some owls are crows.

1. All (I), (II) and (III) follows
2. Only (II) and (III) follows
3. Either (I) or (III) follows
4. Either (I) or (II) follows

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ
Question ID : 458908611
Option 1 ID : 4589082441
Option 2 ID : 4589082442
Option 3 ID : 4589082443
Option 4 ID : 4589082444
Status : Answered
Chosen Option : 2

Q.4

A circle is inscribed in a square of diagonal $7\sqrt{2}$ cm. What would be the circumference of the circle?

1. 22 cm
2. 44 cm
3. $14\sqrt{2}\pi$ cm
4. 49 cm

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ
Question ID : 458908627
Option 1 ID : 4589082505
Option 2 ID : 4589082506
Option 3 ID : 4589082507
Option 4 ID : 4589082508
Status : Not Answered
Chosen Option : --

Q.5

In a shop there were 4 dolls of different heights A, B, C and D. D is neither as tall as A nor as short as C. B is shorter than D but taller than C. If Mani wants to purchase the tallest doll, which one should she purchase?

- 1. A
- 2. D
- 3. Either A or D
- 4. Either B or D

Options 1. 1

- 2. 2
- 3. 3
- 4. 4

Question Type : MCQ
Question ID : 458908616
Option 1 ID : 4589082461
Option 2 ID : 4589082462
Option 3 ID : 4589082463
Option 4 ID : 4589082464
Status : Answered
Chosen Option : 1

Q.6

Very often, the farmers add lime to the soil before ploughing because:

- 1. lime decreases the acidity of the soil
- 2. the soil become soft and it becomes easy to plough
- 3. lime takes up the extra moisture of the soil
- 4. high concentration of lime aids the plant growth

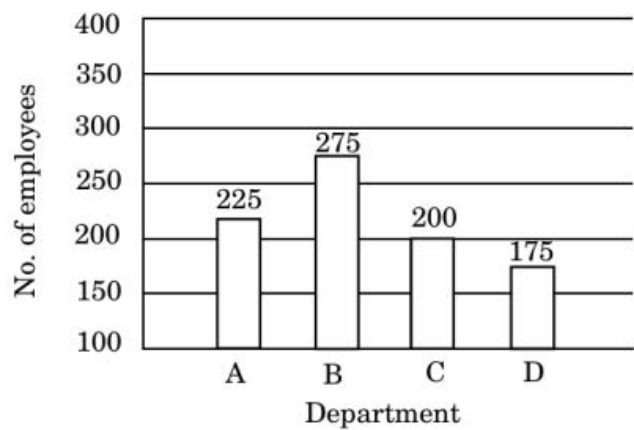
Options 1. 1

- 2. 2
- 3. 3
- 4. 4

Question Type : MCQ
Question ID : 458908621
Option 1 ID : 4589082481
Option 2 ID : 4589082482
Option 3 ID : 4589082483
Option 4 ID : 4589082484
Status : Not Answered
Chosen Option : --

Q.7

Following is the data of employees working in different departments.



Department	Males : Females
A	9:16
B	3:2
C	9:31
D	2:3

What is the total number of males working in all departments together?

- 1. 291
- 2. 342
- 3. 361
- 4. 401

Options 1. 1
2. 2
3. 3
4. 4

Question Type : MCQ

Question ID : 458908618

Option 1 ID : 4589082469

Option 2 ID : 4589082470

Option 3 ID : 4589082471

Option 4 ID : 4589082472

Status : Not Answered

Chosen Option : --

Q.8

The Table below shows the total number of students who enrolled for five courses over the last four years.

Course	1999	2000	2001	2002
BM	24	29	30	33
MR	43	39	38	40
SM	25	30	26	29
CB	21	19	23	24
IM	29	33	34	24

If it is mandated that a student who wishes to enroll for BM or CB has to enroll for MR, then which of the following statements is necessarily true?

- 1. In 1999 only one student has enrolled for both BM and CM
- 2. In 2001, not more than 7 students could have enrolled both for BM and CM
- 3. In 2002, not more than 5 students could have enrolled both for BM and CB
- 4. In 2000, at least 9 students must have enrolled both for CB and BM

- Options 1. 1
2. 2
3. 3
4. 4

Question Type : MCQ

Question ID : 458908619

Option 1 ID : 4589082473

Option 2 ID : 4589082474

Option 3 ID : 4589082475

Option 4 ID : 4589082476

Status : Not Answered

Chosen Option : --

Q.9

The companies rate their employees on the scale of 1 to 100. The average score of all the employees of company A is 75 and that of company B is 90. Arpit decide to leave the company B and moves to company A. This movement resulted in the increase in the mean score of both the companies.

Which of the statement is correct about the rating score of Arpit?

1. Arpit has a rating score 92
2. Arpit has a rating score 72
3. Arpit has a rating score less than 75
4. Arpit has a rating score more than 75 but less than 90

Options 1. 1

2. 2
3. 3
4. 4

Question Type : **MCQ**
Question ID : **458908626**
Option 1 ID : **4589082501**
Option 2 ID : **4589082502**
Option 3 ID : **4589082503**
Option 4 ID : **4589082504**
Status : **Not Answered**
Chosen Option : --

Q.10

Three friends start morning walk in a park at the same time and each one completes one round in 24 seconds, 36 seconds and 48 seconds respectively. After how much time will they meet at one point?

1. 176 second
2. 124 second
3. 156 second
4. 144 second

Options 1. 1

2. 2
3. 3
4. 4

Question Type : **MCQ**
Question ID : **458908625**
Option 1 ID : **4589082497**
Option 2 ID : **4589082498**
Option 3 ID : **4589082499**
Option 4 ID : **4589082500**
Status : **Answered**
Chosen Option : **4**

Q.11

The score of two students in a test were found to be in a ratio 5:7. Further, the difference between their squares was 216. Find the sum of the two numbers.

- 1. 44
- 2. 28
- 3. 16
- 4. 36

Options 1. 1

- 2. 2
- 3. 3
- 4. 4

Question Type : MCQ
Question ID : 458908624
Option 1 ID : 4589082493
Option 2 ID : 4589082494
Option 3 ID : 4589082495
Option 4 ID : 4589082496
Status : Not Answered
Chosen Option : --

Q.12

There are two conditions given for some numbers

- (A) The sum of two numbers is 37.
- (B) The product of these two numbers is 300.

Find the sum of the square of these two numbers.

- 1. 689
- 2. 337
- 3. 676
- 4. 769

Options 1. 1

- 2. 2
- 3. 3
- 4. 4

Question Type : MCQ
Question ID : 458908629
Option 1 ID : 4589082513
Option 2 ID : 4589082514
Option 3 ID : 4589082515
Option 4 ID : 4589082516
Status : Not Answered
Chosen Option : --

Q.13

The following pair of words has a certain relationship to each other.

Current : Amper

Find the pair of words from the given option, which does not have same relationship to each other.

- 1. Force : Newton
- 2. Power : Weber
- 3. Pressure : Pascal
- 4. Energy : Joule

Options 1. 1

- 2. 2
- 3. 3
- 4. 4

Question Type : MCQ
Question ID : 458908620
Option 1 ID : 4589082477
Option 2 ID : 4589082478
Option 3 ID : 4589082479
Option 4 ID : 4589082480
Status : Answered
Chosen Option : 2

Q.14

There are six members in a family A, B, C, D, E and F. B is son of C but C is not the mother of B. A and C are married couple. E is the brother of C, D is the daughter of A. F is the brother of B. Who is the mother of B?

- 1. F
- 2. A
- 3. D
- 4. C

Options 1. 1

- 2. 2
- 3. 3
- 4. 4

Question Type : MCQ
Question ID : 458908615
Option 1 ID : 4589082457
Option 2 ID : 4589082458
Option 3 ID : 4589082459
Option 4 ID : 4589082460
Status : Answered
Chosen Option : 2

Q.15 A clock is so placed that at 12 noon its minute hand points towards North-East. In which direction does its hour hand point at 1:30 p.m.?

- 1. North
- 2. South
- 3. East
- 4. West

Options 1. 1
2. 2
3. 3
4. 4

Question Type : **MCQ**
Question ID : **458908614**
Option 1 ID : **4589082453**
Option 2 ID : **4589082454**
Option 3 ID : **4589082455**
Option 4 ID : **4589082456**
Status : **Not Answered**
Chosen Option : --

Q.16 In a certain code '9 7 5' is written as 'Throw away garbage'
'5 2 8' is written as 'Give away smoking'
'2 1 3' is written as 'Smoking is harmful'. Which digit in the code means 'Give'?

- 1. 5
- 2. 2
- 3. 8
- 4. 3

Options 1. 1
2. 2
3. 3
4. 4

Question Type : **MCQ**
Question ID : **458908613**
Option 1 ID : **4589082449**
Option 2 ID : **4589082450**
Option 3 ID : **4589082451**
Option 4 ID : **4589082452**
Status : **Answered**
Chosen Option : **3**

Q.17

Two students appeared for an examination. One of them secured 10 marks more than the other and his marks were 75% of the sum of their marks. The marks obtained by them are

- 1. 18 and 8
- 2. 15 and 5
- 3. 20 and 10
- 4. 25 and 15

Options 1. 1

- 2. 2
- 3. 3
- 4. 4

Question Type : MCQ
Question ID : 458908630
Option 1 ID : 4589082517
Option 2 ID : 4589082518
Option 3 ID : 4589082519
Option 4 ID : 4589082520
Status : Not Answered
Chosen Option : --

Q.18

Identify the wrong term in the following series :
AY25, BW46, CV65, DS76, EQ85

- 1. CV65
- 2. BW46
- 3. DS76
- 4. EQ85

Options 1. 1

- 2. 2
- 3. 3
- 4. 4

Question Type : MCQ
Question ID : 458908612
Option 1 ID : 4589082445
Option 2 ID : 4589082446
Option 3 ID : 4589082447
Option 4 ID : 4589082448
Status : Answered
Chosen Option : 1

Q.19

By selling a toy for Rs. 1,200, a man losses 20%. At what price should he sell it to earn profit of 20%?

- 1. Rs. 1,800
- 2. Rs. 2,000
- 3. Rs. 1,500
- 4. Rs. 1,000

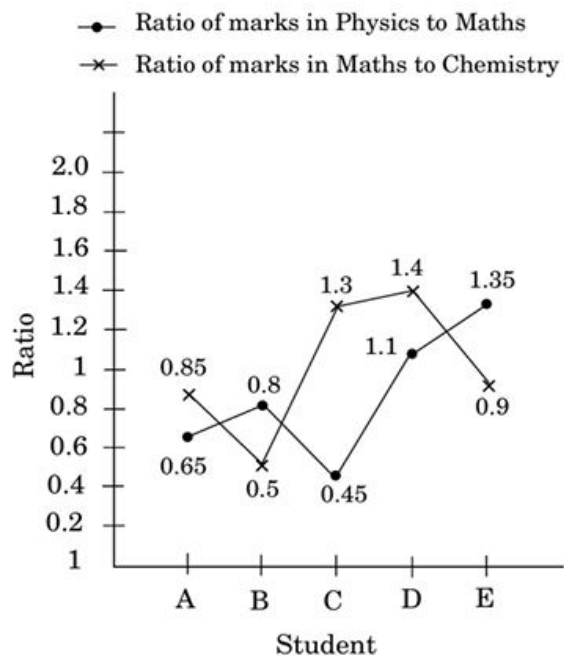
Options 1. 1

- 2. 2
- 3. 3
- 4. 4

Question Type : **MCQ**
Question ID : **458908623**
Option 1 ID : **4589082489**
Option 2 ID : **4589082490**
Option 3 ID : **4589082491**
Option 4 ID : **4589082492**
Status : **Not Answered**
Chosen Option : --

Q.20

The graph shows ratio of marks in physics to maths and ratio of marks in maths to chemistry of 5 students in an examination. How many students got more marks in chemistry than in physics?



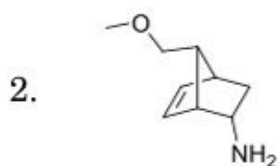
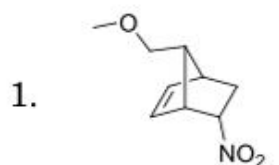
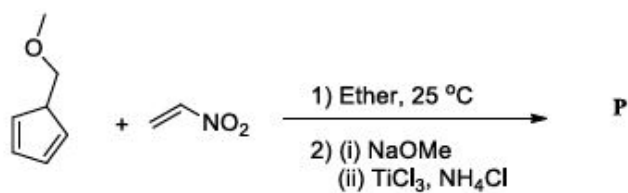
- 1. 1
- 2. 2
- 3. 3
- 4. 4

Options 1. 1
2. 2
3. 3
4. 4

Question Type : MCQ
Question ID : 458908617
Option 1 ID : 4589082465
Option 2 ID : 4589082466
Option 3 ID : 4589082467
Option 4 ID : 4589082468
Status : Not Answered
Chosen Option : --

Q.21

Identify the major product, **P** formed in the given reaction.



Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ

Question ID : 458908653

Option 1 ID : 4589082609

Option 2 ID : 4589082610

Option 3 ID : 4589082611

Option 4 ID : 4589082612

Status : Answered

Chosen Option : 3

Q.22

The arithmetic mean and median of the given data: 20.00, 20.20, 20.40, 20.60, 20.80, 21.20, 24.20, 24.60, respectively, are

1. 21.50 and 20.70
2. 21.50 and 20.60
3. 21.50 and 21.50
4. 20.60 and 20.80

Options

1. 1
2. 2
3. 3
4. 4

Question Type : MCQ

Question ID : 458908658

Option 1 ID : 4589082629

Option 2 ID : 4589082630

Option 3 ID : 4589082631

Option 4 ID : 4589082632

Status : Not Attempted and Marked For Review

Chosen Option : --

Q.23

According to Hückel theory, the correct statement about the butadiene, is,

1. Exciting an electron from the HOMO to the LUMO will not change the π bond order.
2. The central C–C bond has a lower π -bond order than the terminal C–C bonds.
3. It is most likely to undergo electrophilic substitution at one of the two inner carbon atoms.
4. There are three π -energy levels and one non-bonding MO.

Options

1. 1
2. 2
3. 3
4. 4

Question Type : MCQ

Question ID : 458908666

Option 1 ID : 4589082661

Option 2 ID : 4589082662

Option 3 ID : 4589082663

Option 4 ID : 4589082664

Status : Not Attempted and Marked For Review

Chosen Option : --

Q.24

The presence of ${}^{40}_{19}\text{K}$ makes living tissue appreciably radioactive. It may decay either by β emission or K capture. The resulting nuclei, respectively, are:

1. ${}^{40}_{18}\text{Ar}$ and ${}^{40}_{20}\text{Ca}$
2. ${}^{40}_{20}\text{Ca}$ and ${}^{40}_{18}\text{Ar}$
3. ${}^{39}_{19}\text{K}$ and ${}^{40}_{20}\text{Ca}$
4. ${}^{39}_{19}\text{K}$ and ${}^{40}_{18}\text{Ar}$

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **458908636**

Option 1 ID : **4589082541**

Option 2 ID : **4589082542**

Option 3 ID : **4589082543**

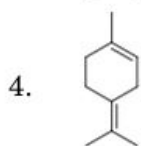
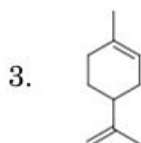
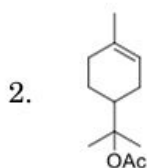
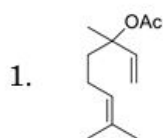
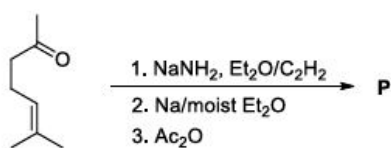
Option 4 ID : **4589082544**

Status : **Answered**

Chosen Option : **2**

Q.25

Which one of the following is the major product, **P** of the given reaction?



Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **458908655**

Option 1 ID : **4589082617**

Option 2 ID : **4589082618**

Option 3 ID : **4589082619**

Option 4 ID : **4589082620**

Status : **Not Answered**

Chosen Option : --

Q.26

A proton chemical shift of $\delta = 3.2$ ppm corresponds to a frequency of 2400 Hz on a certain NMR instrument. The magnetic field strength of this instrument, in MHz, is

1. 750
2. 800
3. 600
4. 1000

Options 1. 1

2. 2
3. 3
4. 4

Question Type : MCQ
 Question ID : 458908663
 Option 1 ID : 4589082649
 Option 2 ID : 4589082650
 Option 3 ID : 4589082651
 Option 4 ID : 4589082652
 Status : Answered
 Chosen Option : 1

Q.27

The true expression for the Heisenberg Uncertainty principle for two non-commuting operators, $\hat{x}$ and $\hat{p}_x$, is

1. $\sigma_A \sigma_B \geq \frac{h^2}{4}$
2. $\sigma_A \sigma_B \geq \frac{1}{16} \left| \int \Psi^*(x) [\hat{x}, \hat{p}_x] \Psi(x) dx \right|$
3. $\sigma_A \sigma_B \geq \frac{1}{2} \left| \int \Psi^*(x) [\hat{x}, \hat{p}_x] \Psi(x) dx \right|$
4. $\sigma_A^2 \sigma_B^2 \geq \frac{1}{2} \left| \int \Psi^*(x) [\hat{x}^2, \hat{p}_x^2] \Psi(x) dx \right|$

Options 1. 1

2. 2
3. 3
4. 4

Question Type : MCQ
 Question ID : 458908667
 Option 1 ID : 4589082665
 Option 2 ID : 4589082666
 Option 3 ID : 4589082667
 Option 4 ID : 4589082668
 Status : Not Answered
 Chosen Option : --

Q.28 In pure rotational Raman spectroscopy, the selection rule $\Delta J = 0$ for a linear rotor contributes to which one of the following?

1. Rayleigh radiation
2. Vibrational excitation
3. Stokes lines
4. Anti-stokes lines

Options 1. 1

2. 2
3. 3
4. 4

Question Type : MCQ
Question ID : 458908668
Option 1 ID : 4589082669
Option 2 ID : 4589082670
Option 3 ID : 4589082671
Option 4 ID : 4589082672
Status : Not Answered
Chosen Option : --

Q.29 In the following reaction, which one of the following is true?



1. A = Major; B = Minor
2. A = Minor; B = Major
3. Only product B is formed.
4. Only product A is formed.

Options 1. 1

2. 2
3. 3
4. 4

Question Type : MCQ
Question ID : 458908652
Option 1 ID : 4589082605
Option 2 ID : 4589082606
Option 3 ID : 4589082607
Option 4 ID : 4589082608
Status : Answered
Chosen Option : 1

Q.30

Ziegler-Natta catalyst is the binary mixture of titanium chloride and aluminum alkyl ($\text{TiCl}_4/\text{Et}_3\text{Al}$). It polymerizes propylene and gives predominantly isotactic isomer. The polymerization chain growth proceeds via:

1. Oxidative addition.
2. Reductive elimination.
3. Oxidative coupling.
4. Migratory insertion.

Options 1. 1

2. 2
3. 3
4. 4

Question Type : **MCQ**
Question ID : **458908642**
Option 1 ID : **4589082565**
Option 2 ID : **4589082566**
Option 3 ID : **4589082567**
Option 4 ID : **4589082568**
Status : **Answered**
Chosen Option : **2**

Q.31

The ultimate source of reducing electrons generated in the photosystem-II (PS II), is:

1. Chlorophyll a
2. Chlorophyll b
3. Oxygen Evolving Complex (OEC)
4. H_2O

Options 1. 1

2. 2
3. 3
4. 4

Question Type : **MCQ**
Question ID : **458908632**
Option 1 ID : **4589082525**
Option 2 ID : **4589082526**
Option 3 ID : **4589082527**
Option 4 ID : **4589082528**
Status : **Not Answered**
Chosen Option : **--**

Q.32 The number of doubly-bridging CO ligands in $\text{Co}_4(\text{CO})_{12}$, $\text{Rh}_4(\text{CO})_{12}$ and $\text{Ir}_4(\text{CO})_{12}$, respectively, are:

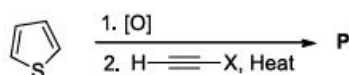
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2. 3, 0, 0
3. 3, 3, 0
4. 3, 3, 3

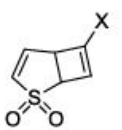
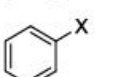
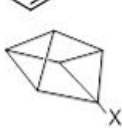
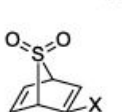
Options 1. 1

2. 2
3. 3
4. 4

Question Type : **MCQ**
 Question ID : **458908638**
 Option 1 ID : **4589082549**
 Option 2 ID : **4589082550**
 Option 3 ID : **4589082551**
 Option 4 ID : **4589082552**
 Status : **Answered**
 Chosen Option : **3**

Q.33 Which one of the following is the major product, **P** of the given reaction?



1. 
2. 
3. 
4. 

Options 1. 1

2. 2
3. 3
4. 4

Question Type : **MCQ**
 Question ID : **458908654**
 Option 1 ID : **4589082613**
 Option 2 ID : **4589082614**
 Option 3 ID : **4589082615**
 Option 4 ID : **4589082616**
 Status : **Not Answered**
 Chosen Option : **--**

Q.34 Operators $\hat{H}$ and $\hat{L}^2$ share the same set eigenfunctions of a hydrogenic atom, having spherically symmetric potential, where $\hat{H}$ and $\hat{L}$ are the energy and angular momentum operators, respectively. Given below are two statements:

Statement I: Energy and angular momentum can be measured simultaneously.

Statement II: Operators $\hat{H}$ and $\hat{L}^2$ commute with each other.

In the light of the above statements, the correct option is,

1. Both Statement I and statement II are true.
2. Both Statement I and statement II are false.
3. Statement I is true but statement II is false.
4. Statement I is false but statement II is true.

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ

Question ID : 458908662

Option 1 ID : 4589082645

Option 2 ID : 4589082646

Option 3 ID : 4589082647

Option 4 ID : 4589082648

Status : Not Answered

Chosen Option : --

Q.35 For the complexes (a) $[\text{W}(\text{CO})_6]$ and (b) $[\text{Ir}(\text{CO})\text{Cl}(\text{PPh}_3)_2]$, ^{13}C O substitution follows _____ and the comparative rates of reactions are _____.

1. (a) Dissociation and (b) Association mechanism; Complex (b) undergoes substitution faster than complex (a)
2. (a) Dissociation and (b) Association mechanism; Complex (a) undergoes substitution faster than complex (b)
3. (a) Association and (b) Dissociation mechanism; Complex (b) undergoes substitution faster than complex (a)
4. Both Dissociation mechanism; Complex (b) undergoes substitution faster than complex (a)

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ

Question ID : 458908643

Option 1 ID : 4589082569

Option 2 ID : 4589082570

Option 3 ID : 4589082571

Option 4 ID : 4589082572

Status : Answered

Chosen Option : 1

Q.36

The bond angles decrease in series $\text{NH}_3 > \text{PH}_3 > \text{AsH}_3 > \text{SbH}_3$. This is due to:

- A. The increase in size of the central atom.
- B. Lower electronegativity as we move down the group.
- C. Increase in repulsion between lone pair of electrons.
- D. Decrease in repulsion between bonding pair of electrons.
- E. Increase in bond "s" character.

Choose the correct answer from the options given below:

- 1. A, B, E are correct.
- 2. A, C, E are correct.
- 3. A, B, C, D are correct.
- 4. A, B, D are correct.

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ

Question ID : 458908633

Option 1 ID : 4589082529

Option 2 ID : 4589082530

Option 3 ID : 4589082531

Option 4 ID : 4589082532

Status : Not Answered

Chosen Option : --

Q.37

Match List I with List II.

List I	List II
Reaction	Reagent
A. $\text{PhCO}_2\text{Et} \longrightarrow \text{Cyclohexyl-CO}_2\text{Et}$	I. H_2 / Pt
B. $\text{PhCO}_2\text{Et} \longrightarrow \text{PhCHO}$	II. $\text{H}_2 / \text{Raney Ni} / 50^\circ\text{C} / 100 \text{ atm}$
C. $\text{Ph} \equiv \text{CH}_2\text{CO}_2\text{H} \longrightarrow \text{Ph-CH(OH)-CH}_2\text{CO}_2\text{H}$	III. $\text{NaBH}_4 / \text{EtOH}$
D. $\text{CH}_3\text{COCH}_2\text{CO}_2\text{Et} \longrightarrow \text{CH}_3\text{CH(OH)CH}_2\text{CO}_2\text{Et}$	IV. $\text{DIBALH} / \text{THF} / -78^\circ\text{C}$

Choose the correct answer from the options given below:

1. A-II, B-IV, C-I, D-III
2. A-I, B-IV, C-II, D-III
3. A-II, B-IV, C-III, D-I
4. A-III, B-IV, C-I, D-II

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ

Question ID : 458908650

Option 1 ID : 4589082597

Option 2 ID : 4589082598

Option 3 ID : 4589082599

Option 4 ID : 4589082600

Status : Answered

Chosen Option : 1

Q.38 The trend in stability for complexes formed between soft metal ions and ligands containing the given donor atoms, is:

1. $N < P < As < Sb$
2. $N \ll P < As \approx Sb$
3. $N \ll P > As > Sb$
4. $P > N > As \approx Sb$

Options 1. 1

2. 2
3. 3
4. 4

Question Type : **MCQ**
Question ID : **458908639**
Option 1 ID : **4589082553**
Option 2 ID : **4589082554**
Option 3 ID : **4589082555**
Option 4 ID : **4589082556**
Status : **Answered**
Chosen Option : **2**

Q.39 A mixture, consist of 2-bromopropane and bromoethane, in 1H NMR shows one peak ($\delta = 3.78$, 1H, septet) with integration 75 and another peak ($\delta = 3.34$, 2H, quartet) with integration 50. What is the mole percentage of bromoethane in the mixture?

1. 25%
2. 60%
3. 40%
4. 75%

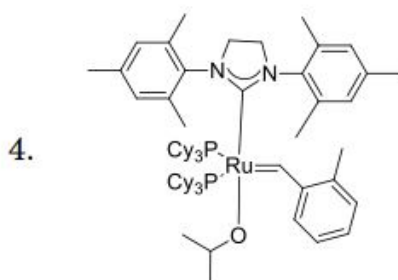
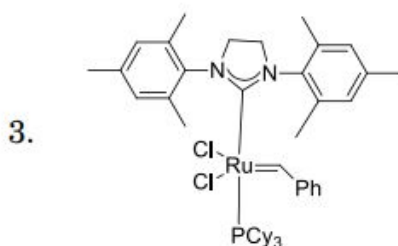
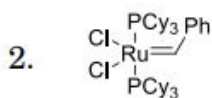
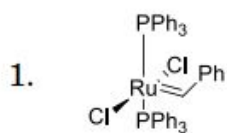
Options 1. 1

2. 2
3. 3
4. 4

Question Type : **MCQ**
Question ID : **458908656**
Option 1 ID : **4589082621**
Option 2 ID : **4589082622**
Option 3 ID : **4589082623**
Option 4 ID : **4589082624**
Status : **Not Answered**
Chosen Option : **--**

Q.40

Which one of the following is the 2nd generation Grubbs catalyst?



Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ

Question ID : 458908649

Option 1 ID : 4589082593

Option 2 ID : 4589082594

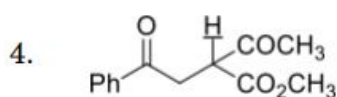
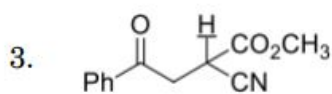
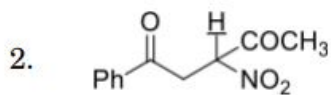
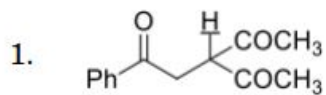
Option 3 ID : 4589082595

Option 4 ID : 4589082596

Status : Answered

Chosen Option : 2

Q.41 In which of the following compounds, the underlined proton possesses the lowest pK_a value?



Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ
 Question ID : 458908647
 Option 1 ID : 4589082585
 Option 2 ID : 4589082586
 Option 3 ID : 4589082587
 Option 4 ID : 4589082588
 Status : Answered
 Chosen Option : 2

Q.42 The lattice parameters for the *Orthorhombic* and *Tetragonal* lattice systems, respectively, are:

1. $a = b = c$; $\alpha = \beta = \gamma = 90^\circ$, and $a = b = c$; $\alpha = \beta = \gamma = 90^\circ$
2. $a = b \neq c$; $\alpha = \beta = \gamma \neq 90^\circ$, and $a = b \neq c$; $\alpha = \beta = \gamma = 90^\circ$
3. $a \neq b \neq c$; $\alpha = \beta = \gamma = 90^\circ$, and $a = b \neq c$; $\alpha = \beta = \gamma = 90^\circ$
4. $a \neq b \neq c$; $\alpha = \beta = \gamma = 90^\circ$, and $a = b \neq c$; $\alpha = \beta = \gamma \neq 90^\circ$

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ
 Question ID : 458908669
 Option 1 ID : 4589082673
 Option 2 ID : 4589082674
 Option 3 ID : 4589082675
 Option 4 ID : 4589082676
 Status : Answered
 Chosen Option : 3

Q.43 Given below are two statements:

Statement I: The interhalogens (XX'_n) are generally composed of two or more different halogen atoms, where X = the less electronegative and X' = more electronegative atoms.

Statement II: The larger, less electronegative atom is in the centre surrounded by one, three, five, or seven smaller, more electronegative atoms.

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

1. Both Statement I and Statement II are true.
2. Both Statement I and Statement II are false.
3. Statement I is true but Statement II is false.
4. Statement I is false but Statement II is true.

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ

Question ID : 458908640

Option 1 ID : 4589082557

Option 2 ID : 4589082558

Option 3 ID : 4589082559

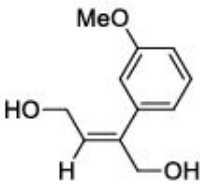
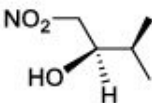
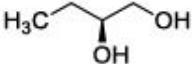
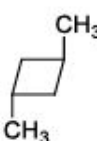
Option 4 ID : 4589082560

Status : Answered

Chosen Option : 1

Q.44

Match List I with List II.

List I Molecule	List II Number of chemically non-equivalent protons
A. 	I. 3
B. 	II. 10
C. 	III. 7
D. 	IV. 8

Choose the correct answer from the options given below:

1. A-III, B-II, C-IV, D-I
2. A-II, B-III, C-IV, D-I
3. A-II, B-IV, C-III, D-I
4. A-IV, B-II, C-III, D-I

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ

Question ID : 458908657

Option 1 ID : 4589082625

Option 2 ID : 4589082626

Option 3 ID : 4589082627

Option 4 ID : 4589082628

Status : Answered

Chosen Option : 2

Q.45 For an electrochemical cell, when all the reactants and products in the cell reaction are in their standard states, the increase in the reaction quotient by a factor of 10 results in the

1. increase in EMF by $23.03 \frac{RT}{F}$.
2. increases in EMF by $2.303 \frac{RT}{F}$.
3. decrease in EMF by $23.03 \frac{RT}{F}$.
4. decrease in EMF by $2.303 \frac{RT}{F}$.

Options

1. 1
2. 2
3. 3
4. 4

Question Type : **MCQ**

Question ID : **458908661**

Option 1 ID : **4589082641**

Option 2 ID : **4589082642**

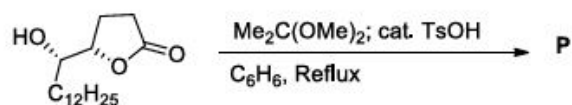
Option 3 ID : **4589082643**

Option 4 ID : **4589082644**

Status : **Not Answered**

Chosen Option : --

Q.46 Identify the major product, **P** obtained in the following reaction.



- 1.
- 2.
- 3.
- 4.

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ
 Question ID : 458908651
 Option 1 ID : 4589082601
 Option 2 ID : 4589082602
 Option 3 ID : 4589082603
 Option 4 ID : 4589082604
 Status : Not Answered
 Chosen Option : --

Q.47 For a hydrogenic atom in an $n = 4$ state, the maximum possible value of z -component of orbital angular momentum, is

1. $\sqrt{3}\hbar$
2. $3\hbar$
3. $12\hbar$
4. $\sqrt{6}\hbar$

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ
 Question ID : 458908670
 Option 1 ID : 4589082677
 Option 2 ID : 4589082678
 Option 3 ID : 4589082679
 Option 4 ID : 4589082680
 Status : Not Answered
 Chosen Option : --

Q.48 The origin of colours in the complexes of Ce^{4+} , Eu^{2+} and Yb^{2+} ions, respectively, are due to:

1. MLCT, f-f and f-d transitions
2. LMCT, f-d and f-d transitions
3. MLCT, f-d and f-d transitions
4. LMCT, MLCT and f-d transitions

Options 1. 1
2. 2
3. 3
4. 4

Question Type : **MCQ**
Question ID : **458908637**
Option 1 ID : **4589082545**
Option 2 ID : **4589082546**
Option 3 ID : **4589082547**
Option 4 ID : **4589082548**
Status : **Answered**
Chosen Option : **4**

Q.49 If the volume is decreased in an isothermal process, the statement that correctly describes the comparison of reactive vs non-reactive system at the equilibrium ($\Delta V \neq 0$):

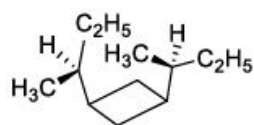
1. The compressibility of the reactive system is equal to the compressibility of the non-reactive system.
2. The compressibility of the reactive system is less than the compressibility of the non-reactive system.
3. The compressibility of the reactive system is greater than the compressibility of the non-reactive system.
4. The compressibility of the reactive and non-reactive systems cannot be directly compared.

Options 1. 1
2. 2
3. 3
4. 4

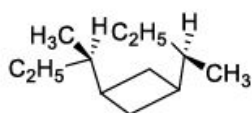
Question Type : **MCQ**
Question ID : **458908664**
Option 1 ID : **4589082653**
Option 2 ID : **4589082654**
Option 3 ID : **4589082655**
Option 4 ID : **4589082656**
Status : **Not Answered**
Chosen Option : **--**

Q.50

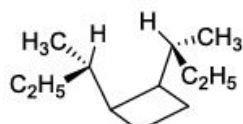
Which of the following compounds are optically active?



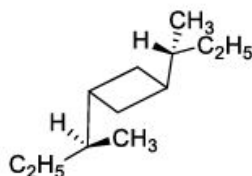
A



B



C



D

Choose the most appropriate answer from the options given below:

1. A & B Only
2. A & C Only
3. B & C Only
4. C & D Only

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ

Question ID : 458908645

Option 1 ID : 4589082577

Option 2 ID : 4589082578

Option 3 ID : 4589082579

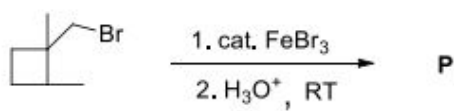
Option 4 ID : 4589082580

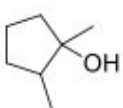
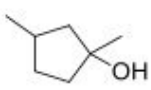
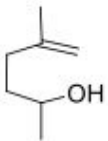
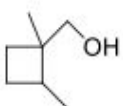
Status : Answered

Chosen Option : 1

Q.51

The major product, **P** formed in the following reaction is



1. 
2. 
3. 
4. 

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **458908646**

Option 1 ID : **4589082581**

Option 2 ID : **4589082582**

Option 3 ID : **4589082583**

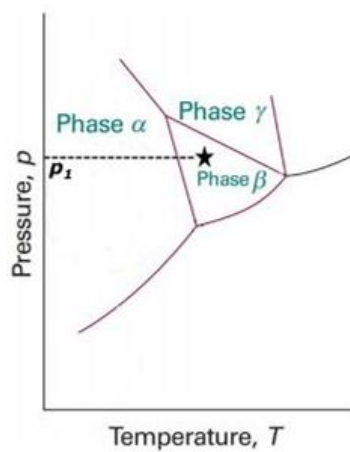
Option 4 ID : **4589082584**

Status : **Answered**

Chosen Option : **2**

Q.52

The number of additional independent intensive variable(s) required to represent the point marked by asterisk at a given pressure, p_1 on the following phase diagram of a one-component system, is



1. 2
2. 1
3. 0
4. 3

Options 1. 1

2. 2
3. 3
4. 4

Question Type : MCQ
Question ID : 458908665
Option 1 ID : 4589082657
Option 2 ID : 4589082658
Option 3 ID : 4589082659
Option 4 ID : 4589082660
Status : Not Answered
Chosen Option : --

Q.53

The Hammett plot for a reaction series gives a straight line passing through ($\sigma = 0$, $\log K = -3.0$) and ($\sigma = +0.5$, $\log K = -1.5$). The ρ value and K_o , respectively, are

1. $+3.0$ and 1.0×10^{-3}
2. $+1.5$ and 1.0×10^{-3}
3. $+3.0$ and 3.16×10^{-2}
4. -3.0 and 1.0×10^{-3}

Options

1. 1
2. 2
3. 3
4. 4

Question Type : MCQ
Question ID : 458908648
Option 1 ID : 4589082589
Option 2 ID : 4589082590
Option 3 ID : 4589082591
Option 4 ID : 4589082592
Status : Not Answered
Chosen Option : --

Q.54

The relative Lewis basicities of the compounds $N(CH_3)_3$; $O(CH_3)_2$; $O(SiH_3)_2$ & $N(SiH_3)_3$ follow the order:

1. $N(CH_3)_3 < N(SiH_3)_3 < O(CH_3)_2 < O(SiH_3)_2$
2. $O(CH_3)_2 < O(SiH_3)_2 < N(SiH_3)_3 < N(CH_3)_3$
3. $O(SiH_3)_2 < O(CH_3)_2 < N(CH_3)_3 < N(SiH_3)_3$
4. $O(SiH_3)_2 < O(CH_3)_2 < N(SiH_3)_3 < N(CH_3)_3$

Options

1. 1
2. 2
3. 3
4. 4

Question Type : MCQ
Question ID : 458908634
Option 1 ID : 4589082533
Option 2 ID : 4589082534
Option 3 ID : 4589082535
Option 4 ID : 4589082536
Status : Answered
Chosen Option : 4

Q.55

Using the character table given below, choose the correct IR-active CO stretching modes for *fac*-Mo(CO)₃(CH₃CN)₃, from the options given below:

$C_{3v} (3m)$	E	$2C_3$	$3\sigma_v$	
A_1	1	1	1	z
A_2	1	1	-1	R_z
E	2	-1	0	$(x, y) (R_x, R_y)$

1. One absorption band at 1790 cm⁻¹.
2. Three absorption bands at 1790 cm⁻¹, 1920 cm⁻¹, and 1650 cm⁻¹.
3. Two absorption bands at 1790 cm⁻¹, and 1920 cm⁻¹.
4. One absorption band at 1920 cm⁻¹.

- Options
1. 1
 2. 2
 3. 3
 4. 4

Question Type : MCQ
Question ID : 458908641
Option 1 ID : 4589082561
Option 2 ID : 4589082562
Option 3 ID : 4589082563
Option 4 ID : 4589082564
Status : Answered
Chosen Option : 3

Q.56

The lowest energy absorption bands for complex ions $[\text{CrF}_6]^{3-}$ and $[\text{Cr}(\text{en})_3]^{3+}$ (en = ethylenediamine) are observed at $14,900\text{ cm}^{-1}$ and $21,850\text{ cm}^{-1}$, respectively, and are located at 18 and 34, respectively, on the horizontal axis of the corresponding Tanabe-Sugano diagram. Analyse the following statements based on the information provided:

- F^- is a weak-field ligand with a greater covalent character than en ligand.
- F^- is a strong-field ligand with a lesser covalent character than en ligand.
- en is a strong-field ligand with a lesser covalent character than F^- ligand.
- en is a strong-field ligand with a greater covalent character than F^- ligand.

The option with correct statement(s) is:

- A and C
- Only B
- Only C
- Only D

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ
 Question ID : 458908631
 Option 1 ID : 4589082521
 Option 2 ID : 4589082522
 Option 3 ID : 4589082523
 Option 4 ID : 4589082524
 Status : Answered
 Chosen Option : 2

Q.57

For a free particle moving along the x-axis, the wavefunction $\psi(x) = \frac{1}{2}e^{10x}$ is not acceptable because

- it is not an eigenfunction of the Hamiltonian operator.
- it is multi-valued.
- it is discontinuous.
- it approaches infinity as x approaches infinity.

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ
 Question ID : 458908660
 Option 1 ID : 4589082637
 Option 2 ID : 4589082638
 Option 3 ID : 4589082639
 Option 4 ID : 4589082640
 Status : Answered
 Chosen Option : 4

Q.58

The point groups of the complexes, $[trans-Ag(CF_3)_2(CN)_2]^-$ and $[cis-Ag(CF_3)_2(CN)_2]^-$, respectively, (assuming collinear Ag-CN groups and freely rotating CF_3 groups), are:

1. C_{2v} and D_{2h}
2. C_{2h} and C_{2v}
3. D_{2h} and C_{2h}
4. D_{2h} and C_{2v}

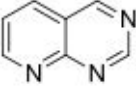
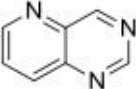
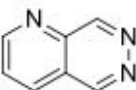
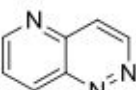
Options

1. 1
2. 2
3. 3
4. 4

Question Type : **MCQ**
Question ID : **458908659**
Option 1 ID : **4589082633**
Option 2 ID : **4589082634**
Option 3 ID : **4589082635**
Option 4 ID : **4589082636**
Status : **Answered**
Chosen Option : **3**

Q.59

Match List I with List II.

List I	List II
Compound	IUPAC name
A. 	I. pyrido[2,3- <i>d</i>]pyrimidine
B. 	II. pyrido[3,2- <i>d</i>]pyrimidine
C. 	III. pyrido[2,3- <i>d</i>]pyridazine
D. 	IV. pyrido[3,2- <i>c</i>]pyridazine

Choose the correct answer from the options given below:

1. A-I, B-II, C-III, D-IV
2. A-II, B-I, C-III, D-IV
3. A-I, B-II, C-IV, D-III
4. A-II, B-I, C-IV, D-III

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ

Question ID : 458908644

Option 1 ID : 4589082573

Option 2 ID : 4589082574

Option 3 ID : 4589082575

Option 4 ID : 4589082576

Status : Not Answered

Chosen Option : --

Q.60

Match List I with List II.

List I

A. Catalase

B. P450

C. Cytochrome c oxidase

D. Ferredoxins

List II

I. $2 \text{H}_2\text{O}_2 \rightarrow 2 \text{H}_2\text{O} + \text{O}_2$

II. Nonheme proteins

III. Reduction O_2 to H_2O

IV. Monooxygenase

Choose the correct answer from the options given below:

1. A-I, B- IV, C-III, D-II

2. A-III, B-II, C-I, D-IV

3. A-I, B-II, C-III, D-IV

4. A-III, B-I, C-IV, D-II

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ

Question ID : 458908635

Option 1 ID : 4589082537

Option 2 ID : 4589082538

Option 3 ID : 4589082539

Option 4 ID : 4589082540

Status : Answered

Chosen Option : 1

Q.61 The ground state 4F term of the tris(oxalato)Cr(III) ion, $[\text{Cr}(\text{C}_2\text{O}_4)_3]^{3-}$ in the D_3 symmetry transforms into $2A_2 + A_1 + 2E$ states with A_2 being the ground state. Using character table, choose the correct option for electronic transitions.

D_3	E	$2C_3$	$3C_2$		
A_1	1	1	1		$x^2 + y^2, z^2$
A_2	1	1	-1	z, R_z	
E	2	-1	0	$(x, y), (R_x, R_y)$	$(x^2 - y^2, xy), (xz, yz)$

- ${}^4A_2 \rightarrow {}^4A_1$ (allowed via z-polarization) and ${}^4A_2 \rightarrow {}^4A_2$ (allowed via x,y polarization)
- ${}^4A_2 \rightarrow {}^4A_1$ (allowed via z-polarization) and ${}^4A_2 \rightarrow {}^4E$ (allowed via x,y polarization)
- ${}^4A_2 \rightarrow {}^4A_2$ (allowed via z-polarization) and ${}^4A_2 \rightarrow {}^4E$ (forbidden via x,y polarization)
- ${}^4A_2 \rightarrow {}^4E$ (allowed via z polarization) and ${}^4A_2 \rightarrow {}^4A_2$ (allowed via x,y polarization)

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**
 Question ID : **458908722**
 Option 1 ID : **4589082885**
 Option 2 ID : **4589082886**
 Option 3 ID : **4589082887**
 Option 4 ID : **4589082888**
 Status : **Answered**
 Chosen Option : **2**

Q.62 The $1s$ orbital of A and $2p_z$ orbital of B form AB molecule, where B is more electronegative than A. The AB bond is 64% covalent in nature. The wavefunction as per valence bond theory, is:

- $\Psi_{AB} = 0.8 [\varphi_A(1) \varphi_B(2) + \varphi_A(2) \varphi_B(1)] + 0.6 \varphi_B(1) \varphi_B(2)$
- $\Psi_{AB} = 0.64 [\varphi_A(1) \varphi_B(2) + \varphi_A(2) \varphi_B(1)] + 0.36 \varphi_B(1) \varphi_B(2)$
- $\Psi_{AB} = 0.6 [\varphi_A(1) \varphi_B(2) + \varphi_A(2) \varphi_B(1)] + 0.8 \varphi_B(1) \varphi_B(2)$
- $\Psi_{AB} = 0.36 [\varphi_A(1) \varphi_B(2) + \varphi_A(2) \varphi_B(1)] + 0.64 \varphi_B(1) \varphi_B(2)$

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**
 Question ID : **458908726**
 Option 1 ID : **4589082901**
 Option 2 ID : **4589082902**
 Option 3 ID : **4589082903**
 Option 4 ID : **4589082904**
 Status : **Not Answered**
 Chosen Option : **--**

Q.63

For the equilibrium $A(s) \rightleftharpoons A(g)$, a plot of $\ln(P)$ vs $1/T$ gives a slope of 1. The enthalpy of the sublimation (ΔH_{sub}^0), assuming ΔH_{sub}^0 to be constant for the given temperature range, is

1. $-R$
2. $+R$
3. $-RT^2$
4. $+RT^2$

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ

Question ID : 458908727

Option 1 ID : 4589082905

Option 2 ID : 4589082906

Option 3 ID : 4589082907

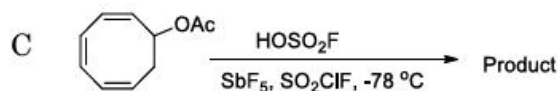
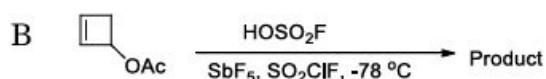
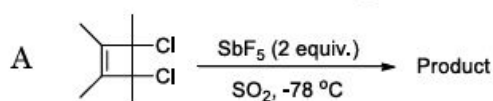
Option 4 ID : 4589082908

Status : Not Answered

Chosen Option : --

Q.64

Which one of the following reactions gives homoaromatic compounds?



Choose the correct answer from the options given below:

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

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ

Question ID : 458908707

Option 1 ID : 4589082825

Option 2 ID : 4589082826

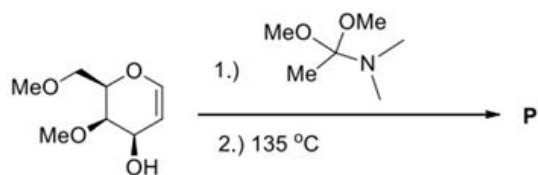
Option 3 ID : 4589082827

Option 4 ID : 4589082828

Status : Answered

Chosen Option : 2

Q.65 Which of the following is the major product, **P** formed in the given reaction?



- 1.
- 2.
- 3.
- 4.

Options 1. 1
2. 2
3. 3
4. 4

Question Type : **MCQ**
 Question ID : **458908699**
 Option 1 ID : **4589082793**
 Option 2 ID : **4589082794**
 Option 3 ID : **4589082795**
 Option 4 ID : **4589082796**
 Status : **Not Attempted and Marked For Review**
 Chosen Option : --

Q.66 The variance of the momentum of a particle in a 1D-box ($0 \leq x \leq L$), is

1. 0
2. $\frac{n^2 \pi^2 \hbar^2}{L^2}$
3. $\frac{2 n^2 \pi^2 \hbar^2}{L^3}$
4. $\frac{2 n^2 \pi^2 \hbar^2}{L^3}$

Options

1. 1
2. 2
3. 3
4. 4

Question Type : MCQ

Question ID : 458908712

Option 1 ID : 4589082845

Option 2 ID : 4589082846

Option 3 ID : 4589082847

Option 4 ID : 4589082848

Status : Not Attempted and Marked For Review

Chosen Option : --

Q.67 $[\text{CoF}_6]^{4-}$ shows three electronic transitions at 7200, 15200 and 19200 cm^{-1} . The value of the Racah parameter, B (in cm^{-1}) for this complex, is closest to

1. 800
2. 850
3. 900
4. 950

Options

1. 1
2. 2
3. 3
4. 4

Question Type : MCQ

Question ID : 458908680

Option 1 ID : 4589082717

Option 2 ID : 4589082718

Option 3 ID : 4589082719

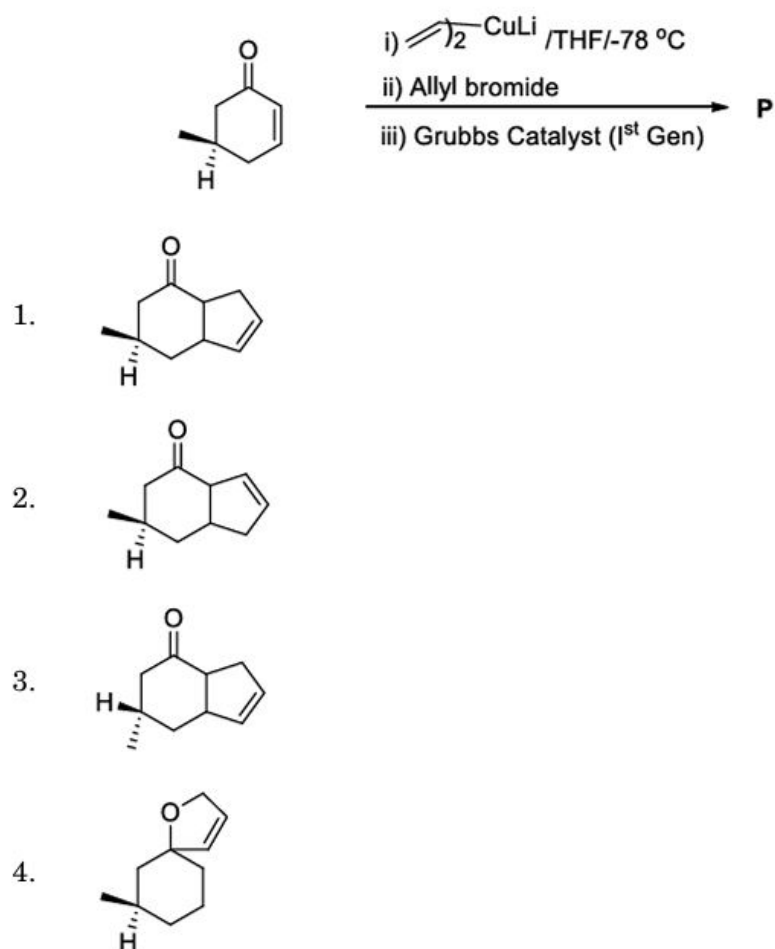
Option 4 ID : 4589082720

Status : Answered

Chosen Option : 2

Q.68

Identify the major product, **P** formed in the following sequence of reactions.



Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ

Question ID : 458908706

Option 1 ID : 4589082821

Option 2 ID : 4589082822

Option 3 ID : 4589082823

Option 4 ID : 4589082824

Status : Not Attempted and Marked For Review

Chosen Option : --

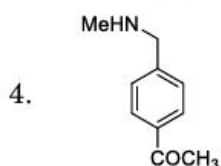
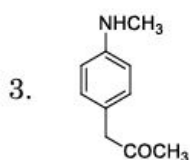
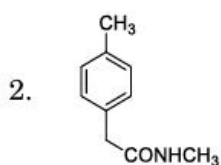
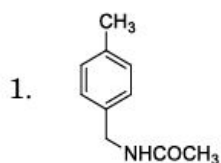
Q.69 Predict the most probable structure of the compound having following spectral data.

Molecular formula: $C_{10}H_{13}NO$

IR stretching frequency (cm^{-1}): 3440 (very strong) and 1710.

1H NMR ($CDCl_3$): δ 7.01 (d, 2H), 6.48 (d, 2H), 4.0 (s, 1H), 3.45 (s, 2H), 2.68 (s, 3H) and 2.1 (s, 3H).

MS (m/z): 163 (M^+), 162, 120, 43.



Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ

Question ID : 458908691

Option 1 ID : 4589082761

Option 2 ID : 4589082762

Option 3 ID : 4589082763

Option 4 ID : 4589082764

Status : Not Attempted and Marked For Review

Chosen Option : --

Q.70

The correct order of angle ONO in the given species, is:

1. $\text{NO}_2^+ < \text{NO}_2 < \text{NO}_3^- < \text{NO}_4^{3-}$
2. $\text{NO}_2 < \text{NO}_2^+ < \text{NO}_3^- < \text{NO}_4^{3-}$
3. $\text{NO}_4^{3-} < \text{NO}_3^- < \text{NO}_2 < \text{NO}_2^+$
4. $\text{NO}_3^- < \text{NO}_4^{3-} < \text{NO}_2^+ < \text{NO}_2$

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **458908672**

Option 1 ID : **4589082685**

Option 2 ID : **4589082686**

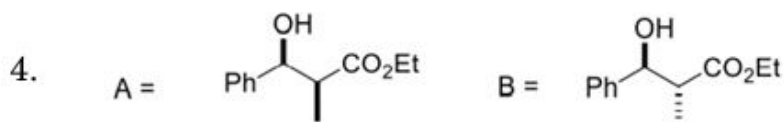
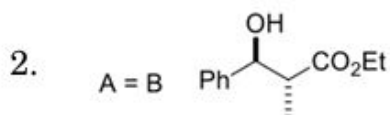
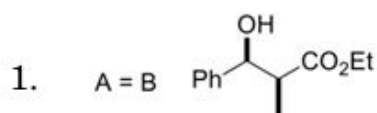
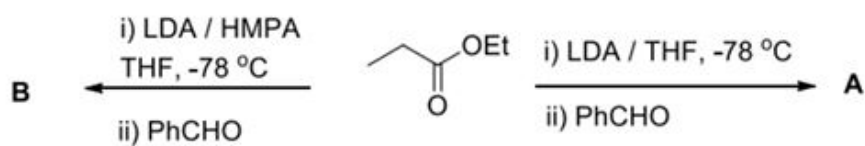
Option 3 ID : **4589082687**

Option 4 ID : **4589082688**

Status : **Answered**

Chosen Option : **3**

Q.71

Identify the major products **A** and **B** in the given reactions.

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ

Question ID : 458908700

Option 1 ID : 4589082797

Option 2 ID : 4589082798

Option 3 ID : 4589082799

Option 4 ID : 4589082800

Status : Not Attempted and Marked For Review

Chosen Option : --

Q.72

Eight distinguishable particles are distributed over the states $0, \varepsilon, 2\varepsilon, 3\varepsilon, 4\varepsilon$ with total energy being 4ε . The number of configurations and the total number of microstates, respectively, are

1. 5 and 330
2. 4 and 260
3. 4 and 302
4. 4 and 162

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **458908718**

Option 1 ID : **4589082869**

Option 2 ID : **4589082870**

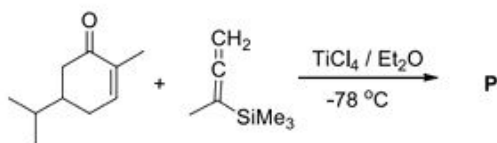
Option 3 ID : **4589082871**

Option 4 ID : **4589082872**

Status : **Not Attempted and Marked For Review**

Chosen Option : --

Q.73

Identify the major product, **P** formed in the following reaction.

1.

Structure 1: A bicyclic product (bicyclo[4.2.0]octan-2-one) with an isopropyl group at C4, a methyl group at C1, and a trimethylsilyl group at C3. The stereochemistry at C3 is (R), with the SiMe₃ group pointing up and the hydrogen pointing down.
2.

Structure 2: A bicyclic product (bicyclo[4.2.0]octan-2-one) with an isopropyl group at C4, a methyl group at C1, and a trimethylsilyl group at C3. The stereochemistry at C3 is (S), with the SiMe₃ group pointing up and the hydrogen pointing down.
3.

Structure 3: A bicyclic product (bicyclo[4.2.0]octan-2-one) with an isopropyl group at C4, a methyl group at C1, and a trimethylsilyl group at C3. The stereochemistry at C3 is (R), with the SiMe₃ group pointing down and the hydrogen pointing up.
4.

Structure 4: A bicyclic product (bicyclo[4.2.0]octan-2-one) with an isopropyl group at C4, a methyl group at C1, and a trimethylsilyl group at C3. The stereochemistry at C3 is (S), with the SiMe₃ group pointing down and the hydrogen pointing up.

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ

Question ID : 458908704

Option 1 ID : 4589082813

Option 2 ID : 4589082814

Option 3 ID : 4589082815

Option 4 ID : 4589082816

Status : Not Attempted and Marked For Review

Chosen Option : --

Q.74

A normalized approximate wavefunction, φ for the hydrogenic atom is given as $\varphi = (1/\sqrt{3}) \psi_{1s} + (1/\sqrt{6}) \psi_{2s} + (1/\sqrt{12}) \psi_{3s} + c_{4s} \psi_{4s}$. Assuming the $\psi_{1s}, \psi_{2s}, \psi_{3s}, \psi_{4s}$ are orthonormal, the value of c_{4s} , is

1. $\sqrt{\frac{7}{12}}$
2. $\sqrt{\frac{3}{12}}$
3. $\sqrt{\frac{5}{12}}$
4. $\sqrt{\frac{1}{12}}$

Options 1. 1

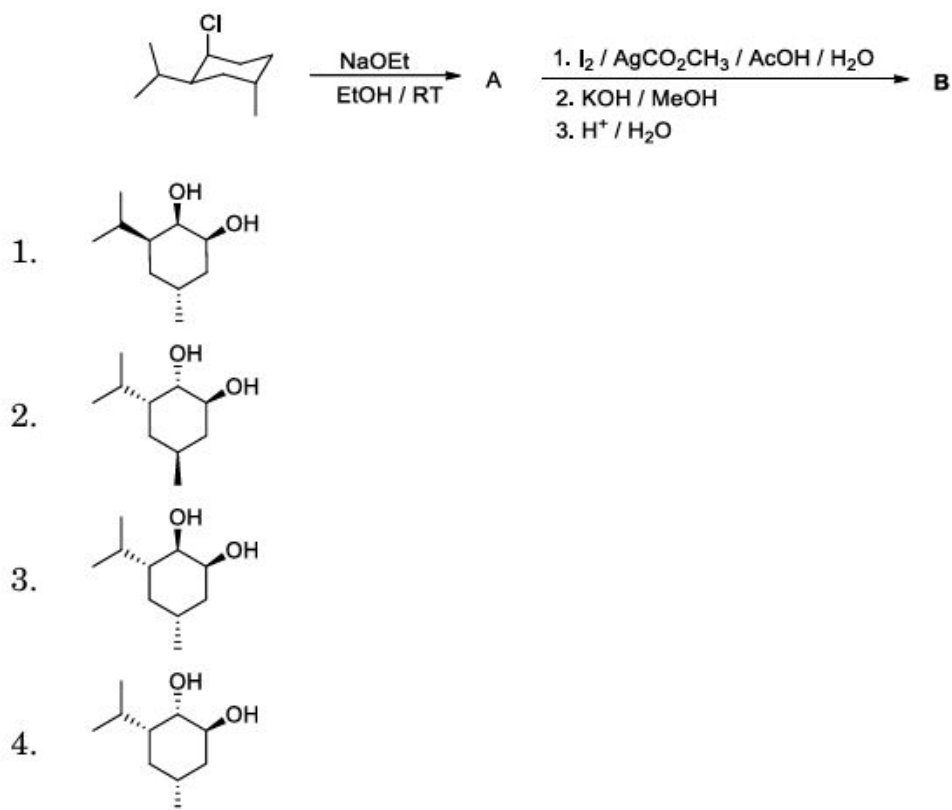
2. 2

3. 3

4. 4

Question Type : MCQ
Question ID : 458908715
Option 1 ID : 4589082857
Option 2 ID : 4589082858
Option 3 ID : 4589082859
Option 4 ID : 4589082860
Status : Answered
Chosen Option : 1

Q.75

Identify the product, **B** obtained in the following reaction.

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ

Question ID : 458908694

Option 1 ID : 4589082773

Option 2 ID : 4589082774

Option 3 ID : 4589082775

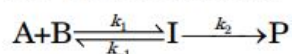
Option 4 ID : 4589082776

Status : Not Attempted and Marked For Review

Chosen Option : --

Q.76

For a given reaction



where k_1 , k_{-1} , k_2 represent the rate constants; A_1 , A_{-1} , and A_2 pre-exponential factors; and E_1 , E_{-1} , and E_2 activation energies for the corresponding steps. As per Lindemann mechanism, the correct relationship between the observed pre-exponential factor (A_{obs}) and activation energy (E_{obs}) at higher concentrations, are

1. $A_{\text{obs}} = \frac{A_1 A_2}{A_{-1}}$ and $E_{\text{obs}} = E_1 + E_2 - E_{-1}$
2. $A_{\text{obs}} = \frac{A_1 A_{-1}}{A_2}$ and $E_{\text{obs}} = E_1 - E_2 - E_{-1}$
3. $A_{\text{obs}} = \frac{A_{-1} A_2}{A_1}$ and $E_{\text{obs}} = E_1 - E_2 - E_{-1}$
4. $A_{\text{obs}} = \frac{A_1 A_2}{A_{-1}}$ and $E_{\text{obs}} = E_1 - E_2 + E_{-1}$

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ

Question ID : 458908714

Option 1 ID : 4589082853

Option 2 ID : 4589082854

Option 3 ID : 4589082855

Option 4 ID : 4589082856

Status : Answered

Chosen Option : 1

Q.77

The point group of the molecule bicyclo [1,1,1] pentane, is

1. D_3
2. D_{3d}
3. D_{3h}
4. C_{3v}

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ

Question ID : 458908713

Option 1 ID : 4589082849

Option 2 ID : 4589082850

Option 3 ID : 4589082851

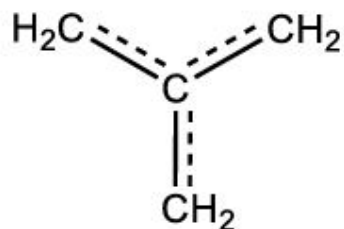
Option 4 ID : 4589082852

Status : Not Attempted and Marked For Review

Chosen Option : --

Q.78

The Hückel π -electron energy of trimethylenemethane, is



1. $4\alpha + 2\sqrt{2}\beta$
2. $2\alpha + 2\sqrt{3}\beta$
3. $3\alpha + 2\sqrt{3}\beta$
4. $4\alpha + 2\sqrt{3}\beta$

Options 1. 1

2. 2
3. 3
4. 4

Question Type : MCQ

Question ID : 458908725

Option 1 ID : 4589082897

Option 2 ID : 4589082898

Option 3 ID : 4589082899

Option 4 ID : 4589082900

Status : Not Attempted and Marked For Review

Chosen Option : --

Q.79 A first-order reflection from the {221} planes of a cubic crystal was observed when X-rays of wavelength 154 pm were used. Given the length of the side of the unit cell is 0.5 nm, the value of $\sin\theta$, is

1. 0.462
2. 0.195
3. 4.62
4. 0.3

Options 1. 1

2. 2
3. 3
4. 4

Question Type : MCQ

Question ID : 458908724

Option 1 ID : 4589082893

Option 2 ID : 4589082894

Option 3 ID : 4589082895

Option 4 ID : 4589082896

Status : Answered

Chosen Option : 1

Q.80

Labelled $^{35}_{16}\text{S}$, upon heating with an aqueous solution of sodium sulphite forms:

1. $^{35}_{16}\text{SSO}_3^{2-}$
2. $^{35}_{16}\text{S}_2\text{O}_3^{2-}$
3. $\text{S}_2\text{O}_3^{2-}$
4. $\text{S}_4\text{O}_6^{2-}$

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ

Question ID : 458908673

Option 1 ID : 4589082689

Option 2 ID : 4589082690

Option 3 ID : 4589082691

Option 4 ID : 4589082692

Status : Not Answered

Chosen Option : --

Q.81

Identify the option containing the correct set of isolobal fragments:
(Cp = cyclopentadienyl ligand)

1. $[\text{CpCo}(\text{CO})]^+ \longleftrightarrow [\text{Co}(\text{CO})_4] \longleftrightarrow [\text{Fe}(\text{CO})_4] \longleftrightarrow \text{CH}_2$
2. $[\text{CpCo}(\text{CO})] \longleftrightarrow [\text{Co}(\text{CO})_4]^+ \longleftrightarrow [\text{Fe}(\text{CO})_5] \longleftrightarrow \text{CH}_2$
3. $[\text{CpCo}(\text{CO})] \longleftrightarrow [\text{Co}(\text{CO})_4]^+ \longleftrightarrow [\text{Fe}(\text{CO})_4] \longleftrightarrow \text{CH}_2$
4. $[\text{CpCo}(\text{CO})] \longleftrightarrow [\text{Co}(\text{CO})_4] \longleftrightarrow [\text{Fe}(\text{CO})_4]^+ \longleftrightarrow \text{CH}_2$

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ

Question ID : 458908682

Option 1 ID : 4589082725

Option 2 ID : 4589082726

Option 3 ID : 4589082727

Option 4 ID : 4589082728

Status : Answered

Chosen Option : 3

Q.82 Consider the following statements regarding cyclic voltammetry:

- A. It is a qualitative technique rather than quantitative.
- B. $\Delta E_p = |E_a - E_c|$, is 0.059 n mV, where n is the number of electrons involved in the electrode reaction.
- C. The current is directly proportional to the square root of the potential scan rate.
- D. The redox potential is directly proportional to the concentration of the electrolyte.
- E. The role of the counter electrode is to complete the electrical circuit, ensuring that electrons do not need to pass across the reference-solution interface.

The option having correct statements, is:

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

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**
Question ID : **458908684**
Option 1 ID : **4589082733**
Option 2 ID : **4589082734**
Option 3 ID : **4589082735**
Option 4 ID : **4589082736**
Status : **Not Answered**
Chosen Option : --

Q.83 Tolman correlated the carbonyl stretching frequencies of $\text{Ni}(\text{CO})_3\text{PR}_3$ complexes with the electronic and steric effects of the substituents. The correct order of frequencies for $\text{R} = \text{C}(\text{CH}_3)_3$, Ph, OMe, and F, is:

- 1. $\text{C}(\text{CH}_3)_3 > \text{Ph} > \text{OCH}_3 > \text{F}$
- 2. $\text{F} > \text{OMe} > \text{Ph} > \text{C}(\text{CH}_3)_3$
- 3. $\text{C}(\text{CH}_3)_3 > \text{OMe} > \text{Ph} > \text{F}$
- 4. $\text{F} > \text{Ph} > \text{OMe} > \text{C}(\text{CH}_3)_3$

Options 1. 1

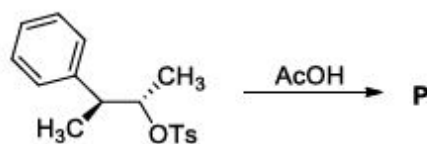
2. 2

3. 3

4. 4

Question Type : **MCQ**
Question ID : **458908677**
Option 1 ID : **4589082705**
Option 2 ID : **4589082706**
Option 3 ID : **4589082707**
Option 4 ID : **4589082708**
Status : **Not Attempted and Marked For Review**
Chosen Option : --

Q.84

Major product, **P** formed in the given reaction is

1. (2*R*, 3*S*)-3-phenylbutan-2-yl acetate
2. (2*S*, 3*R*)-3-phenylbutan-2-yl acetate
3. (2*S*, 3*S*)-3-phenylbutan-2-yl acetate
4. (2*R*, 3*R*)-3-phenylbutan-2-yl acetate

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ

Question ID : 458908710

Option 1 ID : 4589082837

Option 2 ID : 4589082838

Option 3 ID : 4589082839

Option 4 ID : 4589082840

Status : Not Attempted and Marked For Review

Chosen Option : --

Q.85

For the given complexes: (i) $[(\mu^3\text{-CO})\text{Ru}_4(\text{CO})_{12}]^{2-}$ and (ii) $[\text{Os}_3(\text{CO})_{10}(\text{PPh}_3)_2]$, the total number of M-M bonds in each complex, and the number of M-M bonds per metal, respectively, are:

1. (i) 6, and 3; (ii) 4, and 2
2. (i) 4, and 2; (ii) 3, and 2
3. (i) 6, and 3; (ii) 3, and 2
4. (i) 4, and 2; (ii) 6, and 3

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ

Question ID : 458908678

Option 1 ID : 4589082709

Option 2 ID : 4589082710

Option 3 ID : 4589082711

Option 4 ID : 4589082712

Status : Answered

Chosen Option : 2

Q.86

The first transition-metal complex with N_2 ligand **A**, was synthesized by reduction of metal chloride salt with hydrazine, in water. Complex **A** reacts with $[(NH_3)_5M(OH_2)]^{2+}$, **B** to form a N_2 -bridged dinuclear complex **C**. Identify complexes **A**, **B**, and **C**, respectively

1. $[(NH_3)_5Fe(N_2)]^{2+}$, $[(NH_3)_5Fe(OH_2)]^{2+}$, and $[(NH_3)_5Fe-N=N-Fe(NH_3)_5]^{4+}$
2. $[(NH_3)_5Ru(N_2)]^{2+}$, $[(NH_3)_5Ru(OH_2)]^{2+}$, and $[(NH_3)_5Ru-N=N-Ru(NH_3)_5]^{4+}$
3. $[(NH_3)_5Mo(N_2)]^{2+}$, $[(NH_3)_5Ru(OH_2)]^{2+}$, and $[(NH_3)_5Mo-N=N-Ru(NH_3)_5]^{4+}$
4. $[(NH_3)_5Ru(N_2)]^{2+}$, $[(NH_3)_5Fe(OH_2)]^{2+}$, and $[(NH_3)_5Ru-N=N-Fe(NH_3)_5]^{4+}$

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **458908690**

Option 1 ID : **4589082757**

Option 2 ID : **4589082758**

Option 3 ID : **4589082759**

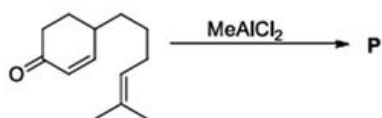
Option 4 ID : **4589082760**

Status : **Not Attempted and Marked For Review**

Chosen Option : --

Q.87

Which one of the following is the major product, **P** of the given reaction?



- 1.
- 2.
- 3.
- 4.

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **458908693**

Option 1 ID : **4589082769**

Option 2 ID : **4589082770**

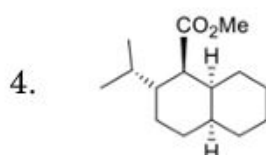
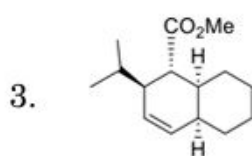
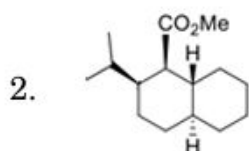
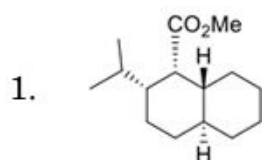
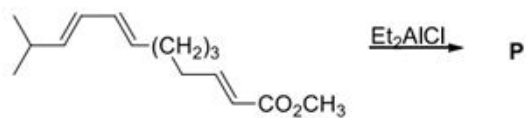
Option 3 ID : **4589082771**

Option 4 ID : **4589082772**

Status : **Answered**

Chosen Option : **4**

Q.88 Identify the major product, **P** formed in the following reaction.



Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **458908701**

Option 1 ID : **4589082801**

Option 2 ID : **4589082802**

Option 3 ID : **4589082803**

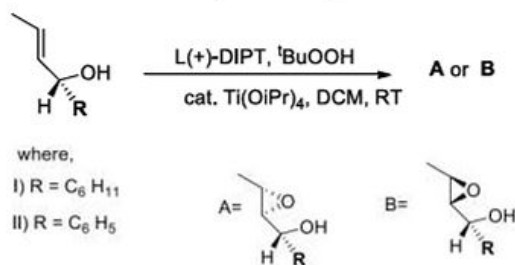
Option 4 ID : **4589082804**

Status : **Not Answered**

Chosen Option : --

Q.89

Identify the **major product** formed in the following reaction and its **order of reactivity** in the presence of different **R** groups.



1. A, II > I
2. A, I > II
3. B, I > II
4. B, II > I

Options 1. 1

2. 2
3. 3
4. 4

Question Type : MCQ

Question ID : 458908695

Option 1 ID : 4589082777

Option 2 ID : 4589082778

Option 3 ID : 4589082779

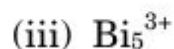
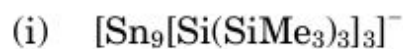
Option 4 ID : 4589082780

Status : Answered

Chosen Option : 3

Q.90

The structural classes of the following ions are:



1. (i) Nido, (ii) Nido and (iii) Closo
2. (ii) Nido, (ii) Closo and (iii) Closo
3. (i) Arachano, (ii) Closo and (iii) Closo
4. (i) Arachano, (ii) Nido and (iii) Closo

Options 1. 1

2. 2
3. 3
4. 4

Question Type : MCQ

Question ID : 458908686

Option 1 ID : 4589082741

Option 2 ID : 4589082742

Option 3 ID : 4589082743

Option 4 ID : 4589082744

Status : Not Attempted and Marked For Review

Chosen Option : --

Q.91

For the following bimolecular gas-phase reactions, the Arrhenius parameters, A and E_a are given below. The kinetic isotopic ratio (k_D/k_H) at 298 K is closest to

[Given *e* = 2.7]

Reactions	A (dm ³ mol ⁻¹ s ⁻¹)	E _a (in unit of RK)
CH ₄ + OH → CH ₃ + H ₂ O	2.0 × 10 ⁹	298
CD ₄ + OH → CD ₃ + DOH	5.4 × 10 ⁸	894

- 0.037
- 0.270
- 0.027
- 0.370

Options 1. 1

- 2
- 3
- 4

Question Type : MCQ
 Question ID : 458908717
 Option 1 ID : 4589082865
 Option 2 ID : 4589082866
 Option 3 ID : 4589082867
 Option 4 ID : 4589082868
 Status : Answered
 Chosen Option : 1

Q.92

Amongst the given complexes, *cis*-[Co(en)₂Cl₂], [Cr(ox)₃]³⁻, [Ru(bpy)₃]²⁺, [Ni(phen)₃]²⁺, [RuBr₄(phen)]⁻ and *cis*-[RuClpy(phen)₂]⁺, the total number of chiral complexes is:

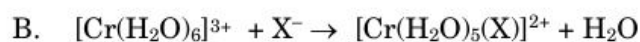
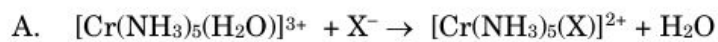
- 3
- 4
- 5
- 6

Options 1. 1

- 2
- 3
- 4

Question Type : MCQ
 Question ID : 458908681
 Option 1 ID : 4589082721
 Option 2 ID : 4589082722
 Option 3 ID : 4589082723
 Option 4 ID : 4589082724
 Status : Answered
 Chosen Option : 3

Q.93 Consider the following water substitution reactions in octahedral complexes by different anions. (where $X^- = \text{NCS}^-, \text{NO}_3^-, \text{Cl}^-, \text{Br}^-$, etc.)



Choose the option with correct mechanisms if the rate constants for different ligands are similar in case of $[\text{Cr}(\text{NH}_3)_5(\text{H}_2\text{O})]^{3+}$ while the same ligands show large variations in rate constants in case of $[\text{Cr}(\text{H}_2\text{O})_6]^{3+}$.

- Both Dissociative Interchange (I_d)
- A. Dissociative Interchange (I_d) and B. Associative Interchange (I_a)
- A. Associative Interchange (I_a) and B. Dissociative Interchange (I_d)
- Both Associative Interchange (I_a)

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **458908683**

Option 1 ID : **4589082729**

Option 2 ID : **4589082730**

Option 3 ID : **4589082731**

Option 4 ID : **4589082732**

Status : **Not Answered**

Chosen Option : --

Q.94 A solution of Fe^{2+} salt upon mixing with potassium hexacyanochromate(III) results in a brick-red precipitate which turns dark green on heating at 100°C . Consider the following potential reasons for these changes:

- A. Linkage isomerization
B. The C-linkage to Fe^{2+} is favoured by LFSE

and choose the correct answer:

- Only A is correct.
- Only B is correct.
- Both A & B are correct.
- Both A & B are incorrect.

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **458908675**

Option 1 ID : **4589082697**

Option 2 ID : **4589082698**

Option 3 ID : **4589082699**

Option 4 ID : **4589082700**

Status : **Not Answered**

Chosen Option : --

Q.95

The electronic energy (E_{elec}) of an ionic molecule H_2^+ is -1.1026 a.u. at the equilibrium bond distance (R_e) of 2.00 a.u. The value of equilibrium dissociation energy, (D_e) for this molecule in a.u., is

1. 2.2026
2. 0.1026
3. 0.6026
4. 1.1026

Options 1. 1

2. 2
3. 3
4. 4

Question Type : MCQ

Question ID : 458908716

Option 1 ID : 4589082861

Option 2 ID : 4589082862

Option 3 ID : 4589082863

Option 4 ID : 4589082864

Status : Not Answered

Chosen Option : --

Q.96

Which of the following is the correct sequence of reagents/conditions in the given reaction?



1. (i) $(\text{COCl})_2$ / DCM (ii) , Et_3N (iii) NaHMDS / THF / -78°C , MeI (iv) LiBH_4
2. (i) $(\text{COCl})_2$ / DCM (ii) , Et_3N (iii) NaHMDS / THF / -78°C , MeI (iv) LiBH_4
3. (i) LAH / THF (ii) DMSO / COCl_2 / -78°C / DCM, Et_3N (iii) LiHMDS / THF, MeI (iv) LiBH_4
4. (i) LAH / THF (ii) , Et_3N (iii) NaHMDS / THF / -78°C , MeI (iv) LiBH_4

Options 1. 1

2. 2
3. 3
4. 4

Question Type : MCQ

Question ID : 458908698

Option 1 ID : 4589082789

Option 2 ID : 4589082790

Option 3 ID : 4589082791

Option 4 ID : 4589082792

Status : Not Answered

Chosen Option : --

Q.97

In the Mössbauer spectrum of iron compounds, the isomer shifts of Fe(II) compounds relative to metallic iron, Fe(0), are generally in the range +1.0 to +1.5 mm s⁻¹ whereas isomer shifts for Fe(III) compounds lie in the range +0.2 to +0.5 mm s⁻¹. Consider the following statements as the reasons for this observation:

- A. The s-electron density at the nucleus is reduced in Fe(II) compared with Fe(0).
- B. The 3d electrons partly screen the nucleus from the inner s electrons.
- C. Fe(III) has increase in s-electron density at the nucleus compared to Fe(II).
- D. Fe(III) has decrease in s-electron density at the nucleus compared to Fe(II).

The option with correct statements, is:

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

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ
Question ID : 458908679
Option 1 ID : 4589082713
Option 2 ID : 4589082714
Option 3 ID : 4589082715
Option 4 ID : 4589082716
Status : Answered
Chosen Option : 3

Q.98

For a radical containing three equivalent ¹⁴N (I =1) nuclei, the total number of hyperfine lines and their intensities ratios, are

- 1. 7 lines with equal intensity
- 2. 27 lines with equal intensity
- 3. 7 lines with intensity ratio of 1:3:6:7:6:3:1
- 4. 7 lines with intensity ratio of 1:3:5:7:5:3:1

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ
Question ID : 458908729
Option 1 ID : 4589082913
Option 2 ID : 4589082914
Option 3 ID : 4589082915
Option 4 ID : 4589082916
Status : Answered
Chosen Option : 3

Q.99

Consider the following statements about methyl isocyanate and silyl isocyanate:

- A. Both are isostructural.
- B. N-atom in methyl isocyanate has a lone pair.
- C. There is $d\pi-p\pi$ bonding in silyl isocyanate.
- D. Both have sp^2 hybridized N-atom.

The option with correct set of statements, is:

- 1. A & D only
- 2. A & B only
- 3. B & C only
- 4. A B & D only

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **458908676**

Option 1 ID : **4589082701**

Option 2 ID : **4589082702**

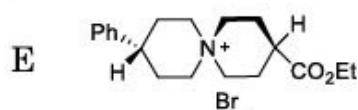
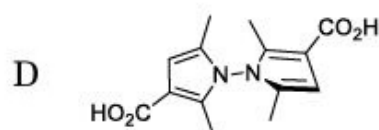
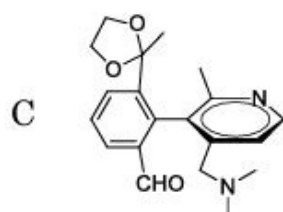
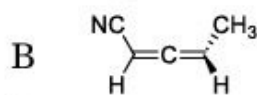
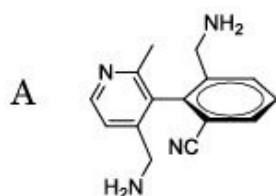
Option 3 ID : **4589082703**

Option 4 ID : **4589082704**

Status : **Not Answered**

Chosen Option : --

Q.100

Which of the following compounds exhibit *R*-configuration?

Choose the correct answer from the options given below:

1. A, B and C only
2. C, D and E only
3. B, C and E only
4. B and C only

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ

Question ID : 458908709

Option 1 ID : 4589082833

Option 2 ID : 4589082834

Option 3 ID : 4589082835

Option 4 ID : 4589082836

Status : Answered

Chosen Option : 3

Q.101 A brown-red crystalline Fe complex, “X” is used to detect the sulphides qualitatively. X reacts with sulphide to form an octahedral Fe-complex, “Y”. The oxidation state of Fe and formal charge of each ligand in Y, respectively, are:

- 1. + II and +1
- 2. + II and -1
- 3. + III and +1
- 4. + III and -1

Options 1. 1
2. 2
3. 3
4. 4

Question Type : **MCQ**
Question ID : **458908674**
Option 1 ID : **4589082693**
Option 2 ID : **4589082694**
Option 3 ID : **4589082695**
Option 4 ID : **4589082696**
Status : **Not Answered**
Chosen Option : --

Q.102 For a diatomic molecule X_2 , the data is provided in the table below. Using variational principle, the energies of bonding and antibonding orbitals of the molecule, respectively, are

	Coulomb Integral (in eV)	Resonance Integral (in eV)	Overlap Integral (in eV)
X	25	5	0.5

- 1. 30 eV and 60 eV
- 2. 20 eV and 30 eV
- 3. 30 eV and 20 eV
- 4. 20 eV and 40 eV

Options 1. 1
2. 2
3. 3
4. 4

Question Type : **MCQ**
Question ID : **458908723**
Option 1 ID : **4589082889**
Option 2 ID : **4589082890**
Option 3 ID : **4589082891**
Option 4 ID : **4589082892**
Status : **Not Answered**
Chosen Option : --

Q.103

The system with the highest degeneracy, is

1. Particle in 3D box with $n_x^2 + n_y^2 + n_z^2 = 29$
2. Rigid rotor with $J = 5$
3. Spin free hydrogenic wave function with $n = 3$
4. Simple harmonic oscillator with $n = 5$

Options

1. 1
2. 2
3. 3
4. 4

Question Type : MCQ

Question ID : 458908728

Option 1 ID : 4589082909

Option 2 ID : 4589082910

Option 3 ID : 4589082911

Option 4 ID : 4589082912

Status : Not Attempted and Marked For Review

Chosen Option : --

Q.104

The Gibbs free energy change (ΔG_{mic}) at -173°C when 0.1 mole fraction of the surfactant is present at Critical Micelle Concentration is closest to (Given $R = 8.314 \text{ J mol}^{-1}\text{K}^{-1}$),

1. $19.150 \text{ J mol}^{-1}$
2. $1.915 \times 10^2 \text{ J mol}^{-1}$
3. $1.915 \times 10^3 \text{ J mol}^{-1}$
4. $1.915 \times 10^4 \text{ J mol}^{-1}$

Options

1. 1
2. 2
3. 3
4. 4

Question Type : MCQ

Question ID : 458908721

Option 1 ID : 4589082881

Option 2 ID : 4589082882

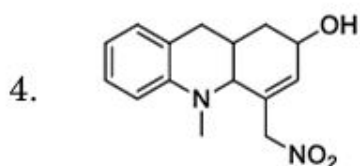
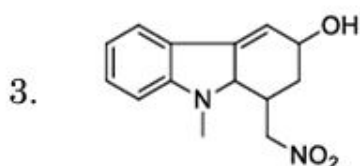
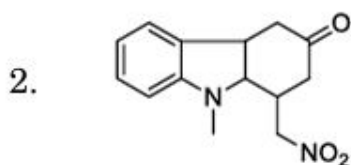
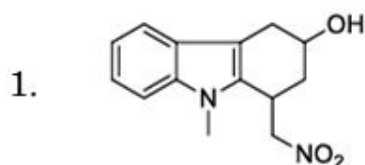
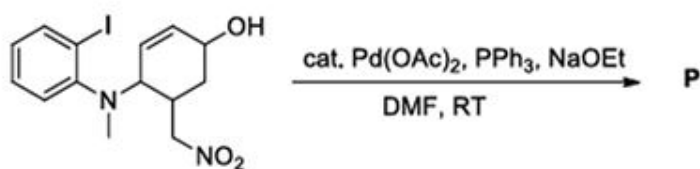
Option 3 ID : 4589082883

Option 4 ID : 4589082884

Status : Not Answered

Chosen Option : --

Q.105

Identify the product, **P** formed in following reaction.

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ

Question ID : 458908697

Option 1 ID : 4589082785

Option 2 ID : 4589082786

Option 3 ID : 4589082787

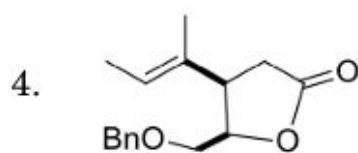
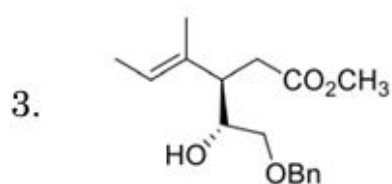
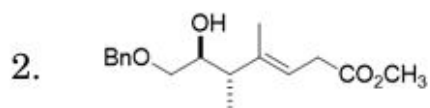
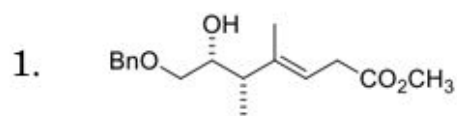
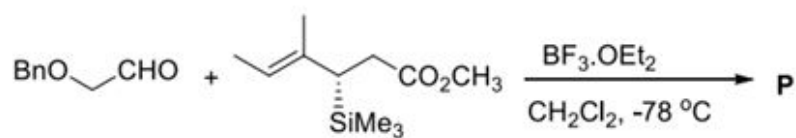
Option 4 ID : 4589082788

Status : Answered

Chosen Option : 1

Q.106

The major product, **P** formed in the following reaction, is:



Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ

Question ID : 458908702

Option 1 ID : 4589082805

Option 2 ID : 4589082806

Option 3 ID : 4589082807

Option 4 ID : 4589082808

Status : Not Answered

Chosen Option : --

Q.107

The complete sets of symmetry representations of the LGOs for σ - and π -bonding, respectively, in an octahedral ML_6 complex, are:

1. (a_{1g} , t_{1u}) and (t_{2g})
2. (a_{1g} , e_g , t_{1u}) and (t_{2g})
3. (a_{1g} , t_{1u}) and (t_{1g} , t_{2g} , t_{1u} , t_{2u})
4. (a_{1g} , e_g , t_{1u}) and (t_{1g} , t_{2g} , t_{1u} , t_{2u})

Options

1. 1
2. 2
3. 3
4. 4

Question Type : MCQ
Question ID : 458908688
Option 1 ID : 4589082749
Option 2 ID : 4589082750
Option 3 ID : 4589082751
Option 4 ID : 4589082752
Status : Answered
Chosen Option : 2

Q.108

The molecular mass of polyethylene with polydispersity index of 1.5 and the degree of polymerization of 2000, is

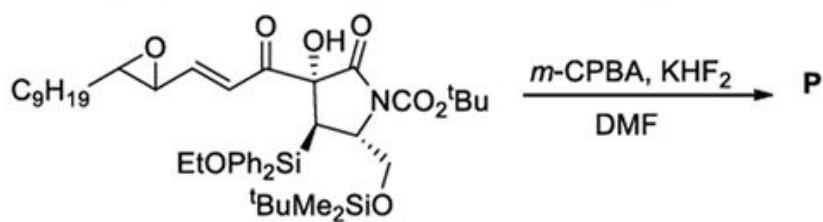
1. 28000
2. 42000
3. 56000
4. 84000

Options

1. 1
2. 2
3. 3
4. 4

Question Type : MCQ
Question ID : 458908719
Option 1 ID : 4589082873
Option 2 ID : 4589082874
Option 3 ID : 4589082875
Option 4 ID : 4589082876
Status : Not Answered
Chosen Option : --

Q.109 Identify the major product, **P** formed in the following reaction.



- 1.
- 2.
- 3.
- 4.

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ
 Question ID : 458908708
 Option 1 ID : 4589082829
 Option 2 ID : 4589082830
 Option 3 ID : 4589082831
 Option 4 ID : 4589082832
 Status : Not Answered
 Chosen Option : --

Q.110

At 25°C, the conductivity of KClO_4 (aq) system is 13.780 mS m^{-1} at concentration $c = 1.000 \text{ mmol dm}^{-3}$. The Kohlrausch constant (κ) is $10.000 \text{ mS m}^2 \text{ mol}^{-1}/(\text{mol dm}^{-3})^{1/2}$. The values of conductivity at $c = 9.000 \text{ mmol dm}^{-3}$ and the limiting molar conductivity (Λ°_m), respectively, are closest to,

[Given $(10^{-3})^{1/2} = 0.0316$]

1. $118.332 \text{ mS m}^{-1}$ and $14.096 \text{ mS m}^2 \text{ mol}^{-1}$
2. $126.864 \text{ mS m}^{-1}$ and $14.096 \text{ mS m}^2 \text{ mol}^{-1}$
3. $118.332 \text{ mS m}^{-1}$ and $13.148 \text{ mS m}^2 \text{ mol}^{-1}$
4. $126.864 \text{ mS m}^{-1}$ and $13.148 \text{ mS m}^2 \text{ mol}^{-1}$

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ

Question ID : 458908720

Option 1 ID : 4589082877

Option 2 ID : 4589082878

Option 3 ID : 4589082879

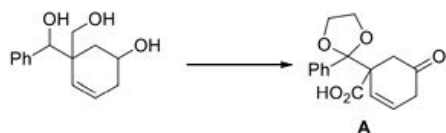
Option 4 ID : 4589082880

Status : Not Attempted and Marked For Review

Chosen Option : --

Q.111

Which of the following is the correct sequence of the reagents that can give product, A?



1. i) MnO_2 , ii) $\text{HOCH}_2\text{CH}_2\text{OH}/\text{H}^+$, iii) PCC (excess)
2. i) PCC (excess), ii) $\text{HOCH}_2\text{CH}_2\text{OH}/\text{H}^+$, iii) MnO_2
3. i) CrO_3/H^+ , ii) $\text{HOCH}_2\text{CH}_2\text{OH}/\text{H}^+$
4. i) Ag_2CO_3 on Celite/ C_6H_6 /reflux, ii) $\text{HOCH}_2\text{CH}_2\text{OH}/\text{H}^+$

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ

Question ID : 458908703

Option 1 ID : 4589082809

Option 2 ID : 4589082810

Option 3 ID : 4589082811

Option 4 ID : 4589082812

Status : Not Answered

Chosen Option : --

Q.112 In the IR spectrum of the $^{12}\text{C}^{16}\text{O}$, the fundamental band and first overtone occur at 2200 cm^{-1} and 4260 cm^{-1} , respectively. The values of $\tilde{\nu}_e$ and $\tilde{x}_e \tilde{\nu}_e$ for the $^{12}\text{C}^{16}\text{O}$, respectively, are

1. 2340 cm^{-1} and 70 cm^{-1}
2. 2340 cm^{-1} and 140 cm^{-1}
3. 2240 cm^{-1} and 140 cm^{-1}
4. 2230 cm^{-1} and 70 cm^{-1}

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**
Question ID : **458908730**
Option 1 ID : **4589082917**
Option 2 ID : **4589082918**
Option 3 ID : **4589082919**
Option 4 ID : **4589082920**
Status : **Answered**
Chosen Option : **1**

Q.113 Analyse the following statements regarding the changes occurring during dioxygen binding to hemoglobin.

- A. The ionic radius of Fe increases.
- B. The Fe centre becomes low-spin.
- C. The Fe-heme bonding interaction is strengthened.
- D. The complex changes from paramagnetic to diamagnetic.
- E. The complex changes from diamagnetic to paramagnetic.

The option with correct statements is:

1. A, B & D only
2. A, C & E only
3. B & D only
4. B, C & D only

Options 1. 1

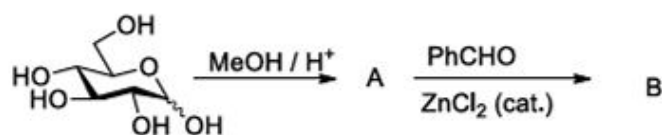
2. 2

3. 3

4. 4

Question Type : **MCQ**
Question ID : **458908689**
Option 1 ID : **4589082753**
Option 2 ID : **4589082754**
Option 3 ID : **4589082755**
Option 4 ID : **4589082756**
Status : **Answered**
Chosen Option : **4**

Q.114

Identify the products **A** and **B** in the following reaction.

1. A= B=
2. A= B=
3. A= B=
4. A= B=

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ

Question ID : 458908692

Option 1 ID : 4589082765

Option 2 ID : 4589082766

Option 3 ID : 4589082767

Option 4 ID : 4589082768

Status : Answered

Chosen Option : 3

Q.115 The arrangements of Os atoms in the given clusters, $\text{Os}_3(\text{CO})_{12}$, $\text{Os}_3(\text{CO})_{12}\text{Br}_2$, $\text{Os}_4(\text{CO})_{14}$, $\text{Os}_4(\text{CO})_{14}\text{I}_2$ are, respectively,

1. Triangular, Linear, Tetrahedral and Butterfly
2. Triangular, Linear, Square Planar and Tetrahedral
3. Linear, Triangular, Tetrahedral and Square Planar
4. Linear, Triangular, Square Planar and Butterfly

Options 1. 1

2. 2

3. 3

4. 4

Question Type : **MCQ**

Question ID : **458908685**

Option 1 ID : **4589082737**

Option 2 ID : **4589082738**

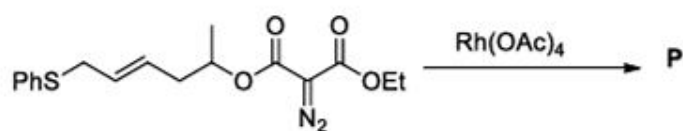
Option 3 ID : **4589082739**

Option 4 ID : **4589082740**

Status : **Answered**

Chosen Option : **1**

Q.116 The major product, **P** formed in the following reaction, is



- 1.
- 2.
- 3.
- 4.

Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ
 Question ID : 458908705
 Option 1 ID : 4589082817
 Option 2 ID : 4589082818
 Option 3 ID : 4589082819
 Option 4 ID : 4589082820
 Status : Not Answered
 Chosen Option : --

Q.117 The number of P–O double bonds and P–O–P linkages in $\text{H}_4\text{P}_2\text{O}_6$, $\text{H}_4\text{P}_2\text{O}_7$, and $\text{H}_5\text{P}_3\text{O}_{10}$, respectively, are:

1. (2, 1), (2, 1) and (3, 2)
2. (2, 0), (2, 1) and (3, 2)
3. (2, 0), (2, 0) and (3, 2)
4. (2, 1), (2, 1) and (3, 0)

Options 1. 1

2. 2
3. 3
4. 4

Question Type : **MCQ**
Question ID : **458908687**
Option 1 ID : **4589082745**
Option 2 ID : **4589082746**
Option 3 ID : **4589082747**
Option 4 ID : **4589082748**
Status : **Answered**
Chosen Option : **2**

Q.118 A substance undergoes phase transition from $\alpha \rightarrow \beta$ with a positive ΔS . If the phase transition temperature increases with the increase in the pressure, which of the following statements is correct?

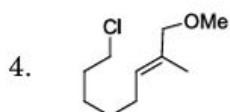
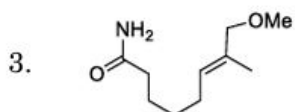
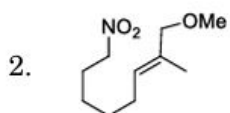
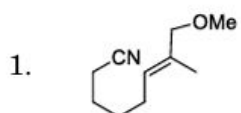
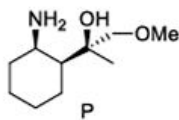
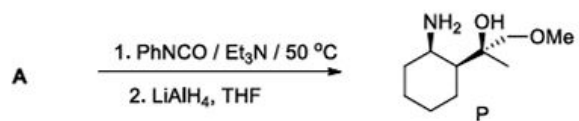
1. α is denser than β .
2. β is denser than α .
3. The densities of α and β are equal.
4. β is denser only at higher temperature.

Options 1. 1

2. 2
3. 3
4. 4

Question Type : **MCQ**
Question ID : **458908711**
Option 1 ID : **4589082841**
Option 2 ID : **4589082842**
Option 3 ID : **4589082843**
Option 4 ID : **4589082844**
Status : **Not Answered**
Chosen Option : **--**

Q.119 In the following reaction which one of the following starting materials, **A** gives the product, **P**?



Options 1. 1

2. 2

3. 3

4. 4

Question Type : MCQ

Question ID : 458908696

Option 1 ID : 4589082781

Option 2 ID : 4589082782

Option 3 ID : 4589082783

Option 4 ID : 4589082784

Status : Not Answered

Chosen Option : --

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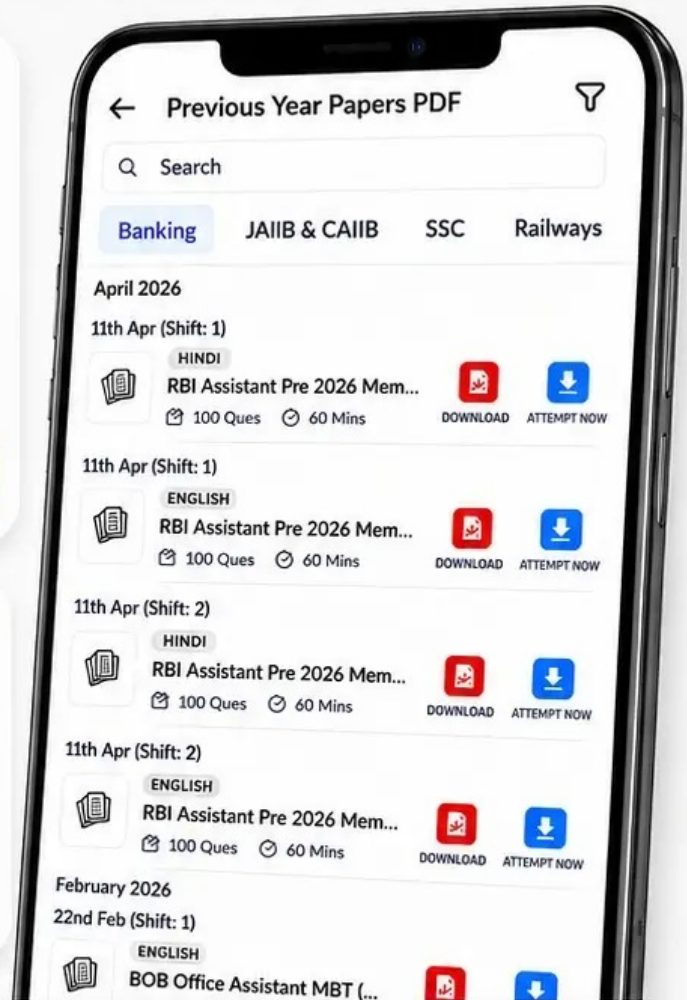
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Q.120 Match List I with List II.

- | List I | List II |
|----------------------|---------------------------|
| A. Melamine | I. Explosive |
| B. Rhizobium | II. Bent Structure |
| C. HN_3 | III. Cyanamide |
| D. Cyanuric triazide | IV. Nitrogen fixing genus |

Choose the correct answer from the options given below :

- 1. A-I, B-IV, C-III, D-II
- 2. A-III, B-IV, C-II, D-I
- 3. A-I, B-II, C-IV, D-III
- 4. A-III, B-I, C-II, D-IV

- Options
- 1. 1
 - 2. 2
 - 3. 3
 - 4. 4

Question Type : MCQ
Question ID : 458908671
Option 1 ID : 4589082681
Option 2 ID : 4589082682
Option 3 ID : 4589082683
Option 4 ID : 4589082684
Status : Not Answered
Chosen Option : --

Exam Summary						
CHEMICAL SCIENCES						
Section Name	No. of Questions	Answered	Not Answered	Marked for Review	Answered & Marked for Review	Not Visited
PART A	20	8	12	0	0	0
PART B	40	23	15	2	0	0
PART C	60	23	21	16	0	0