General Aptitude (GA)

Q.1 – Q.5 Carry ONE mark Each

Q.1 If '→' denotes increasing order of intensity, then the meaning of the words [sick → infirm → moribund] is analogous to [silly → _______ → daft].

Which one of the given options is appropriate to fill the blank?

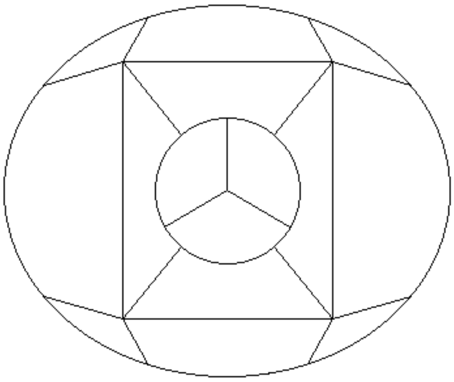
(A) frown

(B) fawn

(C) vein

(D) vain

Q.2 The 15 parts of the given figure are to be painted such that no two adjacent parts with shared boundaries (excluding corners) have the same color. The minimum number of colors required is



(A) 4

(B) 3

(C) 5

(D) 6

Q.3 How many 4-digit positive integers divisible by 3 can be formed using only the digits $\{1, 3, 4, 6, 7\}$, such that no digit appears more than once in a number?

(A) 24

(B) 48

(C) 72

(D) 12

Q.4 The sum of the following infinite series is

$$2 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{8} + \frac{1}{9} + \frac{1}{16} + \frac{1}{27} + \cdots$$

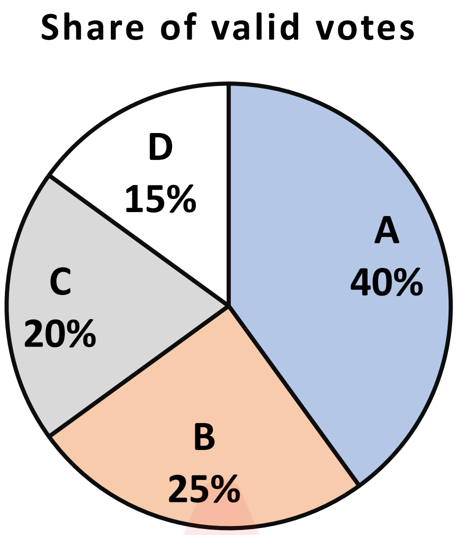
(A) 11/3

(B) 7/2

(C) 13/4

(D) 9/2

Q.5 In an election, the share of valid votes received by the four candidates A, B, C, and D is represented by the pie chart shown. The total number of votes cast in the election were 1,15,000, out of which 5,000 were invalid.



Based on the data provided, the total number of valid votes received by the candidates B and C is

(A) 45,000

(B) 49,500

(C) 51,750

(D) 54,000

Q.6 – Q.10 Carry TWO marks Each

Q.6 Thousands of years ago, some people began dairy farming. This coincided with a number of mutations in a particular gene that resulted in these people developing the ability to digest dairy milk.

Based on the given passage, which of the following can be inferred?

(A) All human beings can digest dairy milk.

(B) No human being can digest dairy milk.

(C) Digestion of dairy milk is essential for human beings.

(D) In human beings, digestion of dairy milk resulted from a mutated gene.

Q.7 The probability of a boy or a girl being born is 1/2. For a family having only three children, what is the probability of having two girls and one boy?

(A) 3/8

(B) 1/8

(C) 1/4

(D) 1/2

Q.8 Person 1 and Person 2 invest in three mutual funds A, B, and C. The amounts they invest in each of these mutual funds are given in the table.

	Mutual fund A	Mutual fund B	Mutual fund C
Person 1	₹10,000	₹20,000	₹20,000
Person 2	₹20,000	₹15,000	₹15,000

At the end of one year, the total amount that Person 1 gets is ₹500 more than Person 2. The annual rate of return for the mutual funds B and C is 15% each. What is the annual rate of return for the mutual fund A?

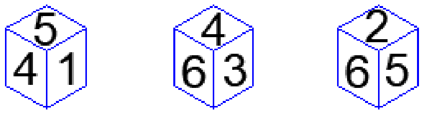
(A) 7.5%

(B) 10%

(C) 15%

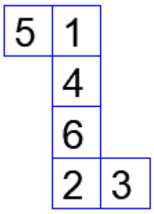
(D) 20%

Q.9 Three different views of a dice are shown in the figure below.

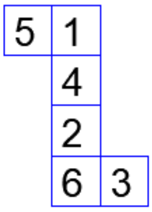


The piece of paper that can be folded to make this dice is

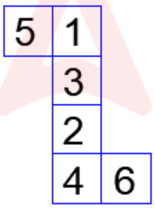
(A)



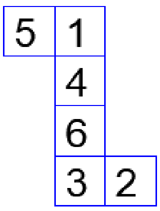
(B)



(C)



(D)



Q.10 Visualize two identical right circular cones such that one is inverted over the other and they share a common circular base. If a cutting plane passes through the vertices of the assembled cones, what shape does the outer boundary of the resulting cross-section make?

(A) A rhombus

(B) A triangle

(C) An ellipse

(D) A hexagon

Q.11 – Q.35 Carry ONE mark Each

Q.11 Among the following, the compound with the lowest CO stretching frequency is

(A) $[Mn(CO)_6]^+$

(B) $[V(CO)_6]^-$

(C) $[Cr(CO)_5]$

(D) $[Cr(dien)(CO)_3]$ (dien: diethylenetriamine)

Q.12 The ground state of $[Cr(H_2O)_6]^{2+}$ is

(A) ${}^5E_g$

(B) ${}^5T_{2g}$

(C) ${}^6A_{1g}$

(D) ${}^6A_{2g}$

Q.13 The reaction of XeF_2 with $HN(SO_2F)_2$ at 273 K in CF_2Cl_2 solvent yields

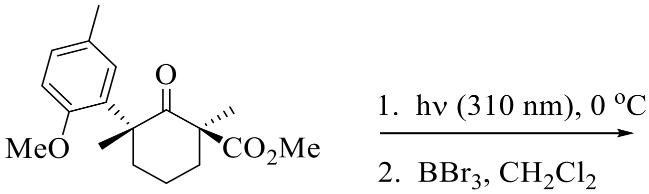
(A) $XeF_4 + SO_2 + NH_3$

(B) $Xe + SO_2 + N_2 + HF$

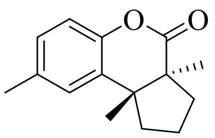
(C) $SOF_2 + XeO_2 + NH_3$

(D) $FXeN(SO_2F)_2 + HF$

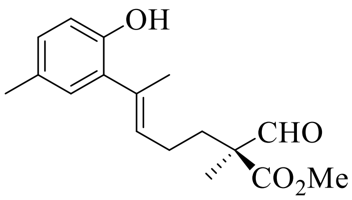
Q.14 The major product in the following reaction sequence is



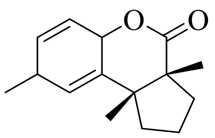
(A)



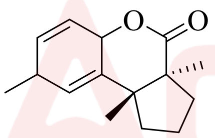
(B)



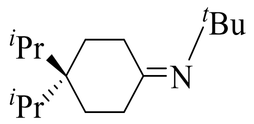
(C)



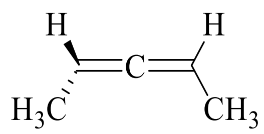
(D)



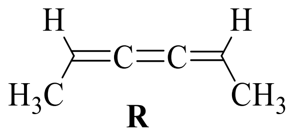
Q.15 Among the following, the chiral compound is



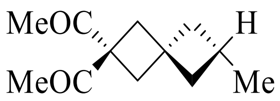
P



Q



R



S

(A) **P**

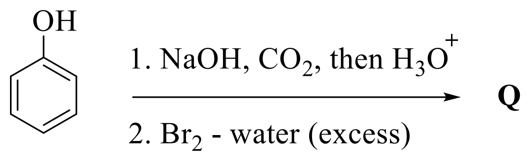
(B) **Q**

(C) **R**

(D) **S**

Q.16 The major product in the given reaction sequence is **Q**. The mass spectrum of **Q** shows

([M] = molecular ion peak)



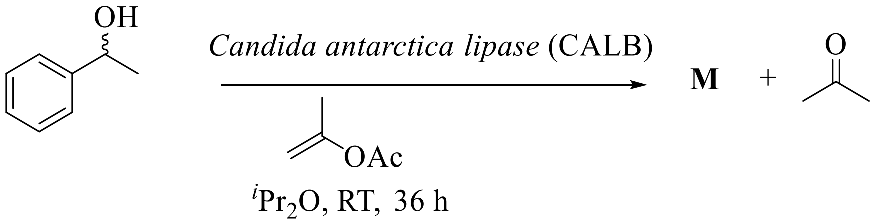
(A) [M], [M+2], [M+4], and [M+6] peaks with relative intensity of 1:1:1:1

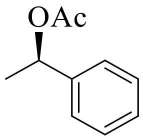
(B) [M], [M+2], [M+4], and [M+6] peaks with relative intensity of 1:3:3:1

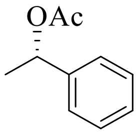
(C) [M], [M+2], and [M+4] peaks with relative intensity of 1:2:1

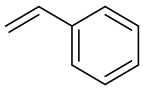
(D) [M] and [M+2] peaks with relative intensity of 1:1

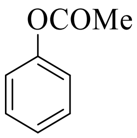
Q.17 The product **M** in the following reaction is



(A) 

(B) 

(C) 

(D) 

Q.18 Critical micellar concentration of a surfactant is 0.008 M in water at 25 °C. If the aggregation number of the micelles is 80, the concentration of the micelles (in M) present in 0.088 M aqueous solution of the surfactant at 25 °C is

(A) 0.010

(B) 0.001

(C) 0.008

(D) 0.088

Q19 The order and the number of classes present in a group with the irreducible representations A_1, A_2, B_1, B_2, E_1, and E_2, are, respectively,

(A) 6 and 6

(B) 12 and 6

(C) 6 and 3

(D) 12 and 3

Q20 The molecule XY_2 is microwave active and its vibration-rotation spectrum shows only P and R transitions. In the correct structure,

(A) X is the central atom in linear XY_2.

(B) X is the central atom in bent XY_2.

(C) Y is the central atom in linear XY_2.

(D) Y is the central atom in bent XY_2.

Q21 The complex(es) with distorted octahedral structure is (are)

(A) $[VF_6]^{3-}$

(B) $[FeF_6]^{3-}$

(C) $[MnF_6]^{3-}$

(D) $[Fe(CN)_6]^{4-}$

Q.22 The compound(s) which show(s) the perovskite structure in solid state is (are)

(A) $CaTiO_3$

(B) $NiFe_2O_4$

(C) Fe_3O_4

(D) $CsPbI_3$

Q.23 Among the following metalloproteins, the pair(s) of **non-heme** proteins is (are)

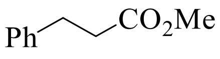
(A) Hemoglobin and Myoglobin

(B) Hemocyanin and Carboxypeptidase

(C) Hemerythrin and Carbonic anhydrase

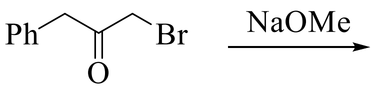
(D) Cytochrome P-450 and Hemocyanin

Q.24 The reaction(s) that yield(s) **X** as the major product is (are)

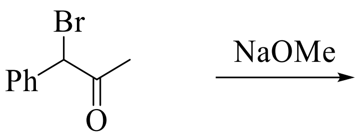


(X)

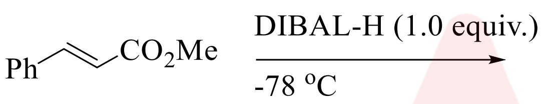
(A)



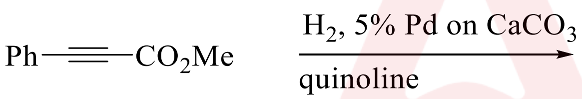
(B)



(C)

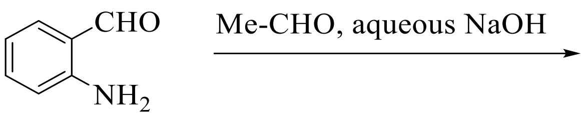


(D)

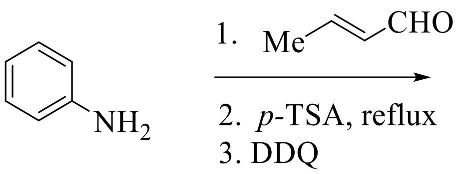


Q.25 The reaction(s) that yield(s) 2-methylquinoline as the major product is (are)

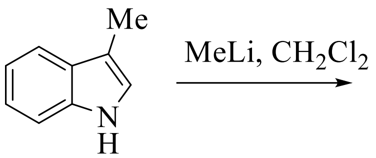
(A)



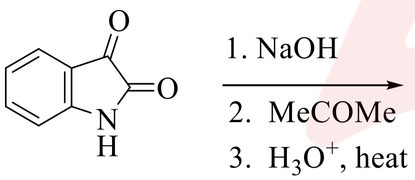
(B)



(C)



(D)



Q.26 The correct statement(s) for decalin is (are)

(A) *cis*-Decalin is thermodynamically less stable than *trans*-decalin.

(B) *cis*-Decalin contains plane of symmetry.

(C) *trans*-Decalin undergoes ring inversion.

(D) *trans*-Decalin belongs to the point group of C_{2h}.

Q.27 The correct statement(s) about $^4D_{5/2}$ state of an atom is (are):

(A) it corresponds to $L = 2, S = 1/2,$ and $J = 5/2$.

(B) it can originate from s^1p^2 electronic configuration.

(C) it splits into five levels in the presence of magnetic field.

(D) it can show spectral transition to $^4P_{3/2}$ state.

Q.28 The correct statement(s) related to an ensemble is (are):

(A) an ensemble is a collection of an infinite number of imaginary replications of the system of interest.

(B) all members of an ensemble are macroscopically identical and also have identical microstates.

(C) an ensemble average of any macroscopic property of the system is equal to the value of the property averaged over a sufficiently long time.

(D) all systems in a canonical ensemble need NOT have the same composition.

Q.29 The non-dissociative adsorption of a gas on a given surface at a fixed temperature follows Langmuir isotherm. The plot(s) which give(s) a straight line is (are)

[Given: V = volume of the adsorbed gas, P = pressure of the gas]

(A) $1/V$ versus $1/P$

(B) P/V versus P

(C) V versus P

(D) V versus $1/P$

Q.30 The crystal field stabilization energy of $[Cr(NH_3)_6]^{3+}$ with Δ_0 value of $21600\ cm^{-1}$ is **y** cm^{-1}. The value of |**y**| is___.

(rounded off to the nearest integer)

Q.31 The number of metal-metal bond(s) in the complex $[(^5\eta\text{-}Cp)Mo(CO)_2]_2$ is **x** and in $[(^5\eta\text{-}Cp)_2Fe_2(CO)_3]$ is **y**. The value of **x** + **y** is ___.

(Assume 18 electron rule is followed.)

(Answer in integer)

Q.32 ^1H NMR spectrum of a mixture containing CH_3Br (**x** mol) and $(CH_3)_3CBr$ (**y** mol) shows two singlets at 2.7 ppm and 1.8 ppm, with the relative ratio of 3:1 (integration value), respectively. The value of **x**/**y** is ____.

(rounded off to the nearest integer)

Q. 33 The value of $\dfrac{e^2}{2\pi\epsilon_0 a_0}$ in atomic unit of energy is ______.

(e: charge of electron; a_0: Bohr radius; ϵ_0: permittivity of vacuum)

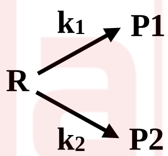
(rounded off to the nearest integer)

Q. 34 The partial vapor pressure of 0.1 molal solution of **B** in liquid **A** is 60 kPa at 300 K. The partial vapor pressure (in kPa) of a solution containing **B** with mole fraction of 0.1 in liquid **A** at 300 K is ____.

(Assume the solute **B** obeys Henry's law. The molar mass of **A** is 80 g mol^{-1}.)

(rounded off to three decimal places)

Q. 35 Consider the following two parallel irreversible first-order reactions, where $\mathbf{k_1} = 2\mathbf{k_2}$ at 300 K. After complete conversion of **R** at 300 K, the concentration of **P1** in the reaction mixture was 15 mol L^{-1}. The initial concentration of **R** (in mol L^{-1}) was ____.



($\mathbf{k_1}$ and $\mathbf{k_2}$ are the rate constants)

(rounded off to one decimal place)

Q.36 – Q.65 Carry TWO marks Each

Q. 36 Borax on treatment with NaOH and H_2O_2 forms **X**. The compound **X** on reaction with PhCN at 60 °C in methanol-water mixture gives **Y** as the major product.

X and **Y**, respectively, are

(A) $NaB(O)(OH)_2 \cdot nH_2O$ and $PhCONH_2$

(B) $NaB(O)(OH)_2 \cdot nH_2O$ and PhCOOH

(C) $Na_2B_2(O_2)_2(OH)_4 \cdot nH_2O$ and $PhCONH_2$

(D) $Na_2B_2(O_2)_2(OH)_4 \cdot nH_2O$ and PhCOOH

Q.37 In the EPR spectrum of an aqueous solution of $VOSO_4$ at room temperature, the total number of hyperfine splitting signals is

(A) 3

(B) 7

(C) 5

(D) 8

Q.38 The heptacity of allyl and Cp and the ligation mode of NO in the thermodynamically stable complexes

$[(\eta^{x}\text{-allyl})Ru(CO)_2(NO)]$ and $[(\eta^{y}\text{-Cp})Ru(CO)_2(NO)]$,

respectively, are

(The heptacity of allyl and Cp are denoted by η^{x} and η^{y}, respectively.)

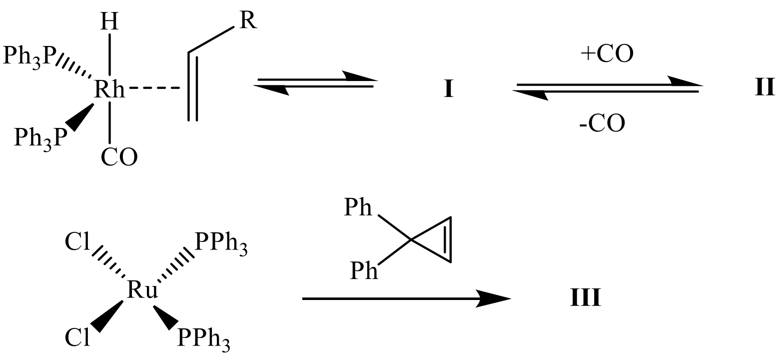
(A) (η^3, NO-bent) and (η^5, NO-linear)

(B) (η^3, NO-linear) and (η^5, NO-bent)

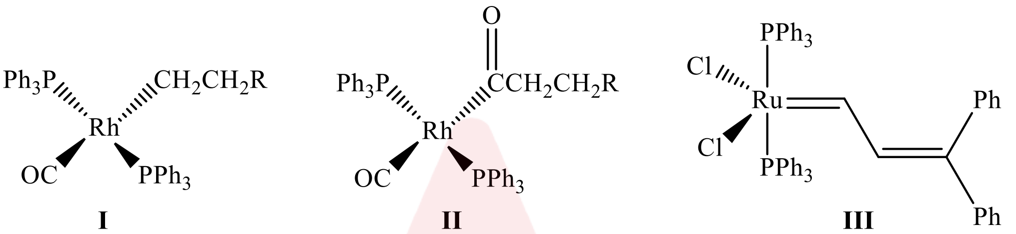
(C) (η^1, NO-bent) and (η^3, NO-bent)

(D) (η^1, NO-bent) and (η^5, NO-linear)

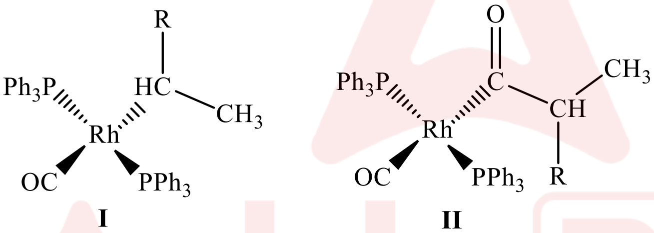
Q.39 In the following reactions, the structures of **I**, **II**, and **III**, respectively, are



(A)



(B)



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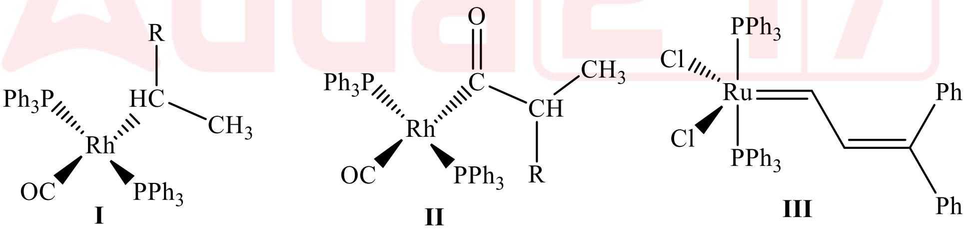
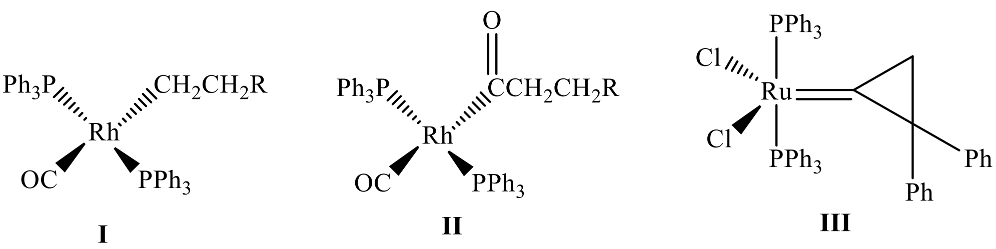


(D)

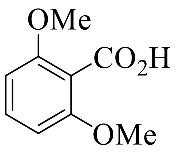


Q.40 Consider the following ^{1}H-NMR (400 MHz, DMSO-d_6) data of a compound:

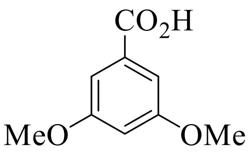
δ in ppm: 3.85 (s, 6H), 6.73 (t, J = 2.2 Hz, 1H), 7.1 (d, J = 2.2 Hz, 2H), and 13.05 (brs, 1H).

The compound is

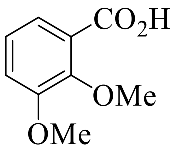
(A)



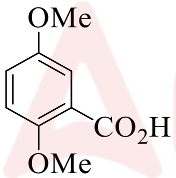
(B)



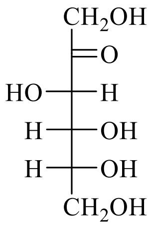
(C)



(D)

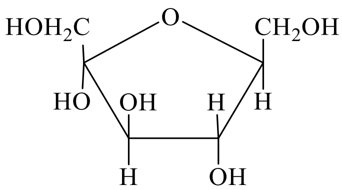


Q.41 Fischer presentation of D-(-)-fructose is given below.

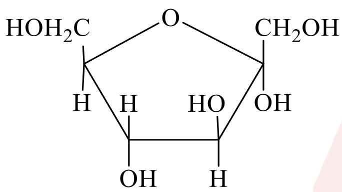


The correct structure of α-L-(+)-fructofuranose is

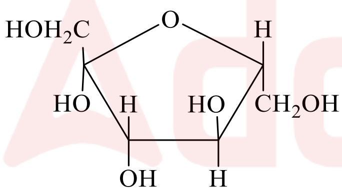
(A)



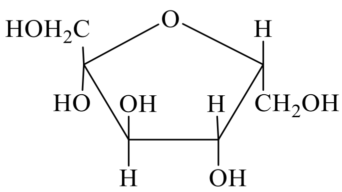
(B)



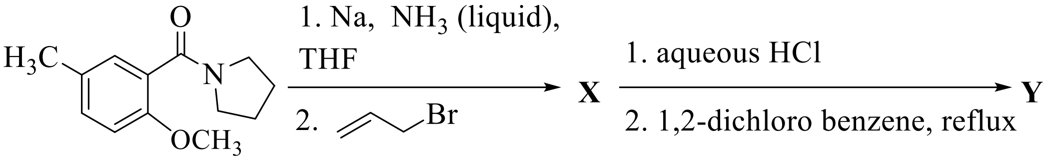
(C)



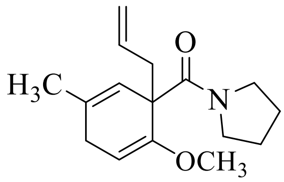
(D)

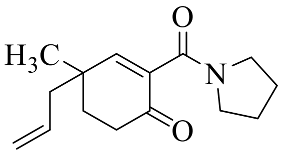


Q.42 The major products **X** and **Y** in the following reaction sequence are

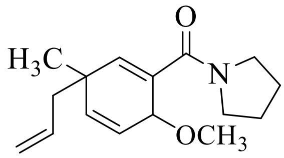


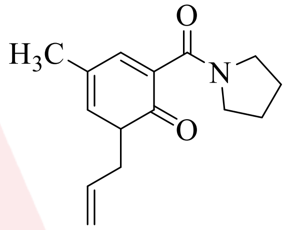
(A)

X = 

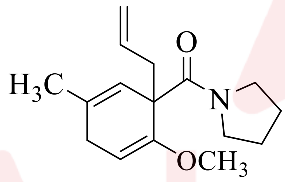
Y = 

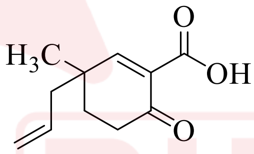
(B)

X = 

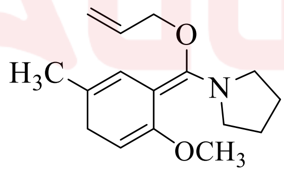
Y = 

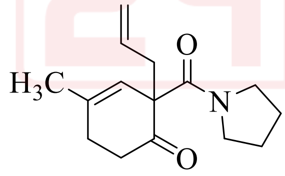
(C)

X = 

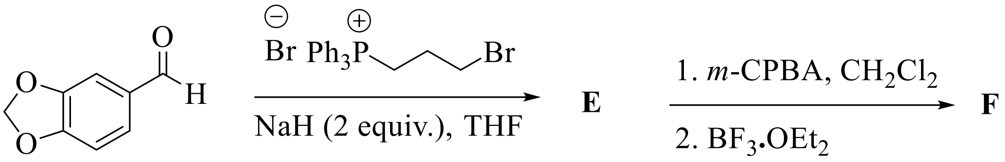
Y = 

(D)

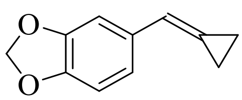
X = 

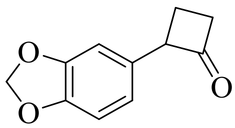
Y = 

Q.43 The major products **E** and **F** in the following reaction sequence are

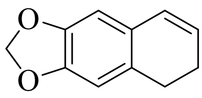


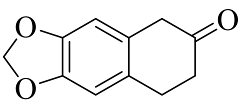
(A)

E = 

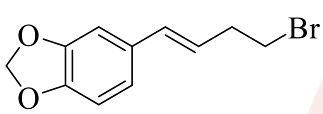
F = 

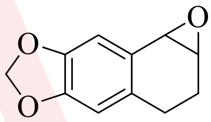
(B)

E = 

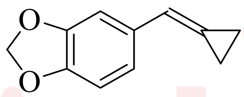
F = 

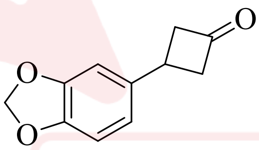
(C)

E = 

F = 

(D)

E = 

F = 

Q. 44 $\psi_1, \psi_2, \psi_3,$ and ψ_4 are four Hückel molecular orbitals of benzene with orbital energies $E_1, E_2, E_3,$ and E_4, respectively.

$$\psi_1 = \frac{1}{2}(\phi_B + \phi_C - \phi_E - \phi_F)$$

$$\psi_2 = 6^{-\frac{1}{2}}(\phi_A - \phi_B + \phi_C - \phi_D + \phi_E - \phi_F)$$

$$\psi_3 = 6^{-\frac{1}{2}}(\phi_A + \phi_B + \phi_C + \phi_D + \phi_E + \phi_F)$$

$$\psi_4 = 12^{-\frac{1}{2}}(2\phi_A + \phi_B - \phi_C - 2\phi_D - \phi_E + \phi_F)$$

The correct order of the orbital energies is

(The six carbon atoms of benzene are denoted by A to F and ϕ_J is the $2p_z$ orbital of J^{th} carbon of benzene.)

(A) $E_1 < E_2 = E_3 < E_4$

(B) $E_4 < E_1 = E_3 < E_2$

(C) $E_3 < E_1 = E_4 < E_2$

(D) $E_3 < E_2 < E_1 = E_4$

Q.45 Consider the following six vibrational modes:

symmetric stretching of CO_2, O-H symmetric stretching of H_2O, stretching of HCl, stretching of H_2, N-H symmetric stretching of NH_3, and bending of CO_2.

Among these modes, if k number of modes are IR active but Raman inactive, l number of modes are IR inactive but Raman active, and m number of modes are both IR and Raman active.

k, l, and m, respectively, are

(A) 1, 3, and 2

(B) 3, 1, and 2

(C) 1, 2, and 3

(D) 2, 1, and 3

Q. 46 The correct statement for a thermally initiated radical polymerization in a solution is:

(Assume: Steady-state and equal reactivity of the propagating radicals, termination reactions are only by combination, and no chain transfer reaction.

Given: Rp = rate of polymerization, DP = degree of polymerization, [I] = initiator concentration, and [M] = monomer concentration.)

(A) with increase in [I], both Rp and DP increase.

(B) with increase in [M], both Rp and DP increase.

(C) Rp decreases with increase in [I] but DP increases with increase in [M].

(D) DP increases with increase in [I] and DP decreases with increase in [M].

Q.47 If q_t and $Q_{t,m}$ are the molecular and molar translational partition functions of X_2, respectively, then $\ln(Q_{t,m}) =$

(N is the Avogadro number)

(A) $N \ln q_t - N \ln N$

(B) $N \ln q_t - \ln N$

(C) $N \ln q_t + N \ln N + N$

(D) $N \ln q_t - N \ln N + N$

Q.48 Among the following, the NMR active nucleus(nuclei) is (are)

(A) ^{12}C

(B) ^{19}F

(C) ^{2}H

(D) ^{16}O

Q.49 The complex(es) that exhibit(s) optical isomerism is (are)

(A) $[Fe(acac)_3]$

(B) *cis*-$[Co(en)_2Cl_2]^+$

(C) *trans*-$[Co(en)_2Cl_2]^+$

(D) $[Co(en)_3]^{3+}$

Q.50 In aqueous solution of $K_4[Fe(CN)_6]$, the allowed transition(s) is (are)

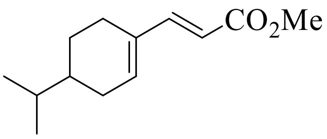
(A) $^{5}T_{2g}$ to $^{3}E_{g}$

(B) $^{1}A_{1g}$ to $^{1}T_{1g}$

(C) $^{1}A_{1g}$ to $^{1}T_{2g}$

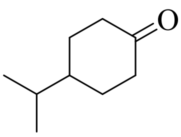
(D) $^{5}T_{2g}$ to $^{5}E_{g}$

Q.51 The correct option(s) that give(s) **P** as the major product is (are)



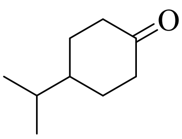
P

(A)



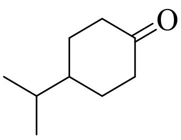
1. LDA, THF, -78 ^{o}C, Tf_2O
2. Methyl acrylate, $Pd(Ph_3P)_2Cl_2$ (2 mol%), Et_3N (3 equiv.), DMF

(B)



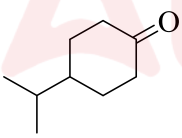
1. $TsNHNH_2$, MeLi (2 equiv.), THF, -78 ^{o}C
2. DMF, 0 ^{o}C
3. NaH, $(OMe)_2P(O)CH_2CO_2Me$, THF, 0 ^{o}C to reflux

(C)



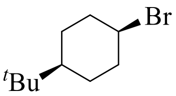
1. $Me_3SiCH(Li)Cl$, THF, -78 ^{o}C
2. $HClO_4$, THF
3. Zn, $BrCH_2CO_2Me$
4. *p*-TSA, reflux

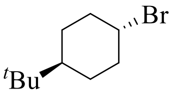
(D)

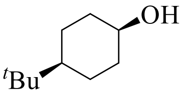


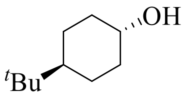
1. L-Selectride, THF
2. MsCl, Et_3N; then NaCN
3. DIBAL-H (1 equiv.), THF, -78 ^{o}C
4. $Ph_3P{=}CH{-}CO_2Me$

Q.52 The correct statement(s) regarding **P**, **Q**, **R**, and **S** is (are):


P


Q


R


S

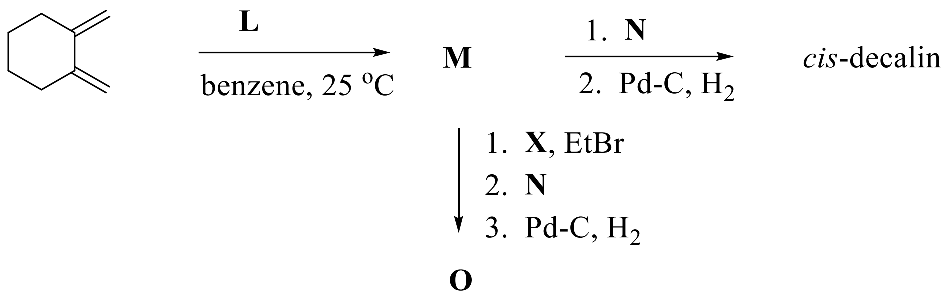
(A) **P** reacts faster than **Q** with PhSNa in DMF as a solvent.

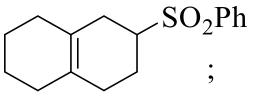
(B) **Q** reacts faster than **P** with NaN_3 in DMF as a solvent.

(C) **R** reacts faster than **S** when treated with TsCl/Et_3N in DCM as a solvent.

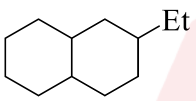
(D) **R** gets oxidized faster than **S** when reacted with CrO_3 in DCM as a solvent.

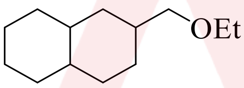
Q.53 Consider the following reaction sequence. The correct option(s) is (are)



(A) **M** = 

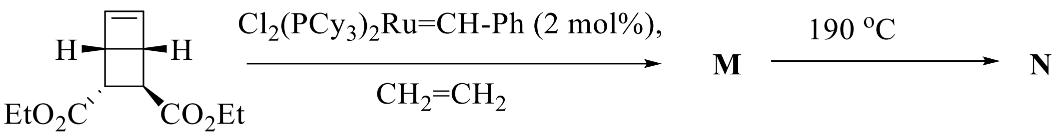
; **N** = Na-Hg/MeOH

(B) **X** = LDA ; **O** = 

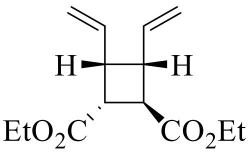
(C) **L** = acrolein; **O** = 

(D) **X** = $LiAlH_4$; **L** = (vinylsulfonyl)benzene

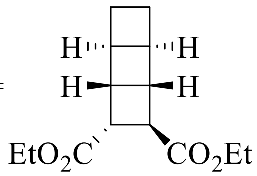
Q.54 Consider the following reaction sequence where **M** and **N** are the major products. The correct option(s) is (are)



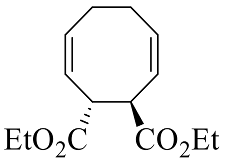
(A) **M** =



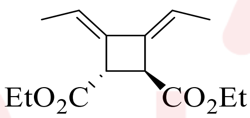
(B) **M** =



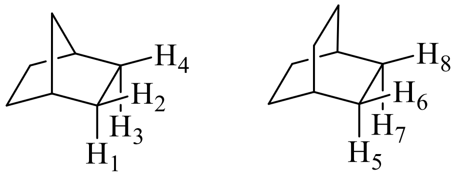
(C) **N** =



(D) **N** =



Q.55 The correct statement(s) about the relationship for the H-atoms in the following compounds is (are):



(A) H_1 and H_3 are enantiotopic; H_2 and H_3 are diastereotopic.

(B) H_1 and H_3 are diastereotopic; H_2 and H_3 are enantiotopic.

(C) H_5 and H_7 are enantiotopic; H_6 and H_7 are homotopic.

(D) H_5 and H_7 are homotopic; H_6 and H_7 are enantiotopic.

Q.56 Among the following, the correct statement(s) is (are):

(A) the normalization factor of a Slater determinant for a 3-electron atom is $\sqrt{\frac{1}{3}}$.

(B) the number of nodes in the radial wave function of 3s orbital of a hydrogen atom is the same as the number of nodes in the angular wave function of a 4d orbital of hydrogen atom.

(C) the energy separation between any two adjacent states is same for a harmonic oscillator, while it is different for a rigid rotor.

(D) the magnitude of the total spin angular momentum of an α electron is the negative of that of a β electron.

Q 57 Among the following, the correct statement(s) is (are):

(A) C_2 symmetry element is present in H_2O and H_2O_2 but NOT in PCl_5.

(B) both C_2 and C_3 symmetry elements are present in CCl_4 and SF_6.

(C) one σ_h and three σ_d symmetry elements are present in benzene.

(D) σ_v symmetry element is present in NH_3 but NOT in BF_3.

Q.58 $\Delta S°$ (in J mol^{-1} K^{-1}) for the given reaction at 298 K is ________.

$$[Cu(H_2O)_6]^{2+} + en \rightleftharpoons [Cu(H_2O)_4(en)]^{2+} + 2H_2O$$

(Given: log K_1 = 10.6, where K_1 is the equilibrium constant. $\Delta H°$ = −54 kJ mol^{-1} and R = 8.314 J mol^{-1} K^{-1})

(rounded off to two decimal places)

Q.59 The turnover frequency (in h^{-1}) of a reaction where 5 mol% of a catalyst is required for 90% conversion in 3 h is ____.

(rounded off to the nearest integer)

Q.60 In thermogravimetric analysis, 12.45 mg of $CuSO_4 \cdot 5H_2O$ was subjected to heating under N_2 atmosphere. At a particular temperature, there was a weight loss of 3.6 mg. The number of water molecule(s) lost per formula unit is ____.

(Given molar mass (in g mol^{-1}) of H = 1.0, O = 16.0, S = 32.0, and Cu = 63.5)

(rounded off to the nearest integer)

Q.61 In the given reaction sequence, the amount of **R** produced (in g) is ____.

$$\underset{(7.8\ \text{g})}{\text{Benzene}} \xrightarrow[80\%]{\text{oleum (excess), } 200\ ^{o}\text{C}} \mathbf{P} \xrightarrow[75\%]{\text{NaOH, heat then } H_3O^+} \mathbf{Q} \xrightarrow[50\%]{HNO_3\ \text{(excess)}/H_2SO_4\ \text{(excess)}} \mathbf{R}$$

(Given: molar mass (in g mol^{-1}) of H = 1, C = 12, N = 14, O = 16, and S = 32)

(rounded off to two decimal places)

Q. 62 The wave function of a particle in a cubic box (of side L) is given by

$$\psi(x, y, z) = \sqrt{32/L^3}\, \sin\frac{\pi x}{L} \cos\frac{\pi x}{L} \sin\frac{2\pi y}{L} \sin\frac{\pi z}{L}.$$

The ratio of the energy of the state corresponding to the above wave function to the ground state energy is ___.

(rounded off to the nearest integer)

Q. 63 ϕ_1 and ϕ_2 are normalized eigenfunctions of a Hermitian operator.

$|\psi\rangle = 3i\,|\phi_1\rangle + 2\,|\phi_2\rangle$ and $|\chi\rangle = -2i\,|\phi_1\rangle + 5\,|\phi_2\rangle$.

The value of $\langle\psi|\chi\rangle + \langle\chi|\psi\rangle$ is ___.

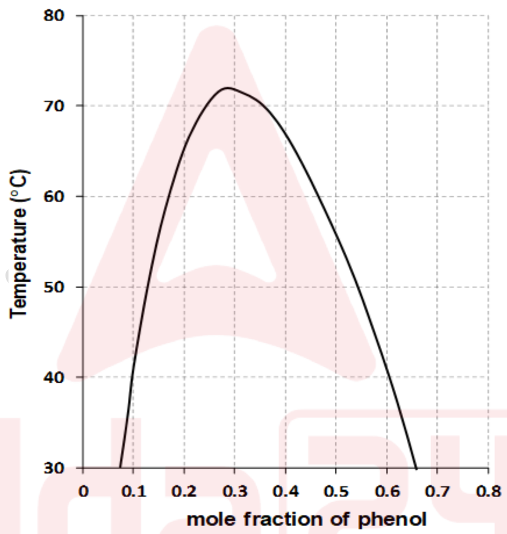
(rounded off to the nearest integer)

Q 64 2 mol of a monoatomic ideal gas with initial volume of 5 L and pressure 10 bar undergoes an irreversible adiabatic expansion against a constant final pressure of 1 bar. The final volume (in L) is _____.

(Given: $R = 8.314 \times 10^{-2}$ L bar mol^{-1} K^{-1})

(rounded off to one decimal place)

Q 65 The following figure shows an experimental liquid-liquid phase diagram of phenol and water at the vapor pressure of the system. The total amount of phenol and water (in mol) present in the phenol-rich phase when 5 mol of water was shaken with 5 mol of phenol at 40 °C is _____.



(rounded off to one decimal place)