

A solution with concentration 0.002 M, having molar absorptivity of $313 \text{ M}^{-1} \text{ cm}^{-1}$ kept in a cell with 4.00 cm path length. The transmittance for the solution will be : **www.FirstRanker.com**

- (A) ☐ 2.50
 (B) ☐ $10^{-2.50}$

(Correct Answer)

- (C) ☐ $10^{2.50}$
 (D) ☐ $10^{1.50}$
 (E) ☐ $10^{-1.50}$

Question No.2 (Question Id - 2)

The solubility product (K_{sp}) of mercurous chloride (Hg_2Cl_2) is 1.2×10^{-18} . The concentration of $[\text{Hg}_2]^{2+}$ and $[\text{Cl}^-]$ is found to be respectively :

- (A) ☐ $6.7 \times 10^{-7} \text{ M}$ and $13.4 \times 10^{-7} \text{ M}$ **(Correct Answer)**
 (B) ☐ $13.4 \times 10^{-7} \text{ M}$ and $6.7 \times 10^{-7} \text{ M}$
 (C) ☐ $6.7 \times 10^{-9} \text{ M}$ and $13.4 \times 10^{-9} \text{ M}$
 (D) ☐ $13.4 \times 10^{-9} \text{ M}$ and $6.7 \times 10^{-9} \text{ M}$
 (E) ☐ $1.2 \times 10^{-7} \text{ M}$ and $2.4 \times 10^{-7} \text{ M}$

Question No.3 (Question Id - 3)

The following statement is correct concerning the IR spectrum of nitrite and isocyanate groups :

- (A) ☐ **The - C \equiv N and - NCO groups absorb in the region of 2260 - 2240 cm^{-1} and 2275 - 2240 cm^{-1} , respectively. (Correct Answer)**
 (B) ☐ The - C \equiv N and - NCO groups absorb in the region of 2590 - 2550 cm^{-1} and 2275 - 2240 cm^{-1} , respectively.
 (C) ☐ The - C \equiv N and - NCO groups absorb in the region of 1690 - 1590 cm^{-1} and 2260 - 2240 cm^{-1} , respectively.
 (D) ☐ The - C \equiv N and - NCO groups absorb in the region of 2275 - 2240 cm^{-1} and 2590 - 2550 cm^{-1} , respectively.
 (E) ☐ The - C \equiv N and - NCO groups absorb in the region of 1690 - 1590 cm^{-1} and 2260 - 2360 cm^{-1} , respectively.

Question No.4 (Question Id - 6)

In the mass spectrum of trifluoroacetic acid, $\text{CF}_3\text{CO}_2\text{H}$, intense peaks are observed at $m/z = 69$ and 45 (base peak) in addition of other peaks. The peak at $m/z = 69$ is accompanied by a peak at $m/z = 70$ which is about 1.1% the intensity of the peak at $m/z = 69$. Which statement is inconsistent with these data ?

- (A) ☐ C - C bond cleavage occurs
 (B) ☐ Fluorine is monatomic
 (C) ☐ $[\text{CO}_2\text{H}]^+$ is a fragment
 (D) ☐ **$\text{CF}_3\text{CO}_2\text{H}$ fragments by sequential loss of F atoms (Correct Answer)**
 (E) ☐ $[\text{CF}_3]^+$ is a fragment

Question No.5 (Question Id - 11)

With increase in temperature the viscosities of gases and liquids respectively.

- (A) ☐ **increase, decrease (Correct Answer)**
 (B) ☐ decrease, increase

Question No.7 (Question Id - 4)

The ^1H NMR spectrum of a compound 'A' shows a doublet and a septet. Which of the following statements is true ?

- (A) ☐ The spectroscopic data are consistent with 'A' containing a n-propyl group.
- (B) ☒ **The spectroscopic data are consistent with 'A' being $(\text{CH}_3)_2\text{CHCl}$. (Correct Answer)**
- (C) ☐ The spectroscopic data are consistent with 'A' containing CH_3CH_2 group.
- (D) ☐ The spectroscopic data are consistent with 'A' being $(\text{CH}_3)_2\text{CCl}_2$.
- (E) ☐ The spectroscopic data are consistent with 'A' containing $(\text{CH}_3)_3\text{C}$ group.

Question No.8 (Question Id - 8)

What will be the decreasing order of absorption of wavelength of light in the visible region for the following complexes ?

- A. $[\text{Co}(\text{NH}_3)_6]^{3+}$
- B. $[\text{Co}(\text{H}_2\text{O})_6]^{3+}$
- C. $[\text{Co}(\text{CN})_6]^{3-}$

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

- (A) ☐ $A > B > C$
- (B) ☐ $C > A > B$
- (C) ☐ $B > C > A$
- (D) ☐ $A > C > B$
- (E) ☒ **$B > A > C$ (Correct Answer)**

Question No.9 (Question Id - 5)

A 0.2 M solution of an optically active compound. 'C' has an observed rotation in a 10 cm cell of (+) 0.6° . The specific rotation of the compound is 20° at room temperature and at 592 nm. The molecular weight of the compound 'C' is :

- (A) ☒ **150 (Correct Answer)**
- (B) ☐ 200
- (C) ☐ 120
- (D) ☐ 240
- (E) ☐ 160

Question No.10 (Question Id - 14)

The lead (Pb) content in the replicate determination of a blood sample was found to be 0.750, 0.754, 0.750 ppm. The standard deviation will be :

- (A) ☐ 0.023
- (B) ☒ **0.0023 (Correct Answer)**
- (C) ☐ 0.00023
- (D) ☐ 0.0032
- (E) ☐ 0.032

(D) ☐ +0.0056

(Correct Answer)

(E) ☐ 0.001**Question No.12 (Question Id - 9)**

A mineral absorbs ultraviolet light and then emits a photon of wavelength 540 nm after converting some of absorbed light energy to heat. The energy of emission is :

(A) ☐ $3.68 \times 10^{-19} \text{ J}$ (Correct Answer)(B) ☐ $1.84 \times 10^{-19} \text{ J}$ (C) ☐ $7.36 \times 10^{-19} \text{ J}$ (D) ☐ $5.40 \times 10^{-19} \text{ J}$ (E) ☐ $2.70 \times 10^{-19} \text{ J}$ **Question No.13 (Question Id - 1)**

In the extraction of a solution of 5.0 gms of butanoic acid in 100 ml of water at 15°C, 100 ml of benzene at 15°C is used. Partition coefficient (K) of butanoic acid between water and benzene is $\frac{1}{3}$ at 15°C. A single extraction with benzene, w (gms) remain in the aqueous layer. w in gms should be :

(A) ☐ 1.0 gm(B) ☐ 2.0 gms(C) ☐ 1.25 gms (Correct Answer)(D) ☐ 0.5 gm(E) ☐ 3.0 gms**Question No.14 (Question Id - 7)**

When a mixture of NaCl, Conc. H_2SO_4 , and $\text{K}_2\text{Cr}_2\text{O}_7$ is heated in a dry test tube, deep red vapour of A evolved. This vapour (A) dissolved in aqueous NaOH gave a yellow solution, which upon treatment with AgNO_3 formed a brick-red precipitate (B). A and B are, respectively :

(A) ☐ CrO_2Cl_2 and $\text{Ag}_2\text{Cr}_2\text{O}_7$ (B) ☐ CrO_2Cl_2 and Ag_2CrO_4 (Correct Answer)(C) ☐ $\text{Na}_2[\text{CrOCl}_5]$ and $\text{Ag}_2\text{Cr}_2\text{O}_7$ (D) ☐ $\text{Na}_2[\text{CrOCl}_5]$ and Ag_2CrO_4 (E) ☐ CrOCl and AgCrO_4 **Question No.15 (Question Id - 15)**

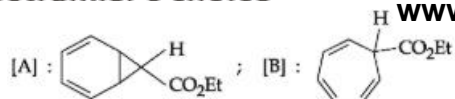
For the systematic error, which statement among the following is not correct ?

(A) ☐ It is determinate error(B) ☐ It is indeterminate error (Correct Answer)(C) ☐ It is reproducible(D) ☐ It arises due to uncalibration(E) ☐ It arises due to chemical contamination**SECTION 2 - PART B****Question No.1 (Question Id - 41)**

The point group of H_2O_2 , if it is in trans form :

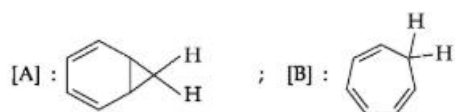
(A) ☐ C_{2u} ☐

(A) ☐



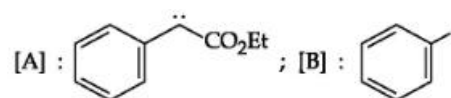
The reaction goes via a radical intermediate.

(B) ☐



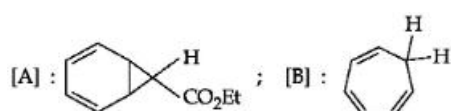
The reaction goes through a carbene intermediate and an electrocyclic ring opening.

(C) ☐



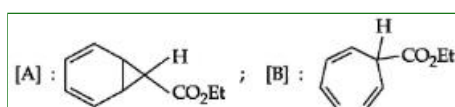
The reaction goes through a carbene intermediate.

(D) ☐



The reaction goes through a radical mechanism.

(E) ☐

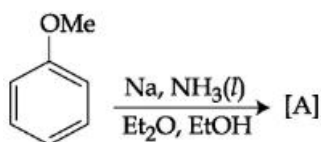


The reaction goes through a carbene intermediate and an electrocyclic ring opening.

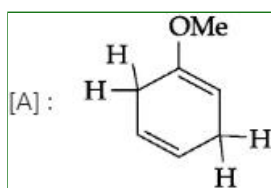
(Correct Answer)

Question No.3 (Question Id - 16)

In the reduction of aromatic rings with metal, the substituents influence the regioselectivity of the reaction.
The major product formed in the following reaction is :

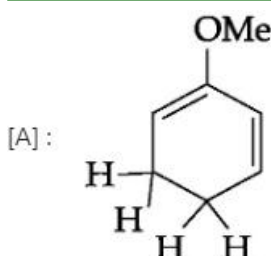


(A) ☐

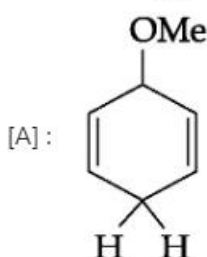


(Correct Answer)

(B) ☐



(C) ☐

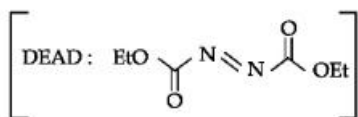
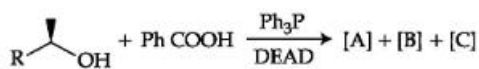


(D) ☐

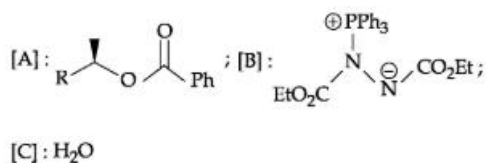
OEt

Question No.4 (Question Id - 22)

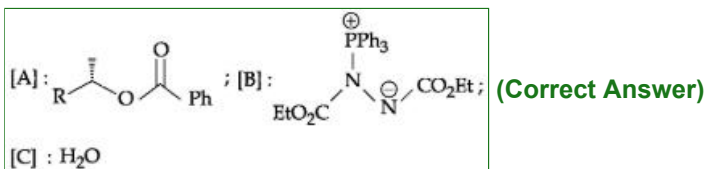
A secondary alcohol is reacted with an aromatic acid in the presence of PPh_3 and DEAD. The following products are formed. Choose the correct products [A], [B] and [C].



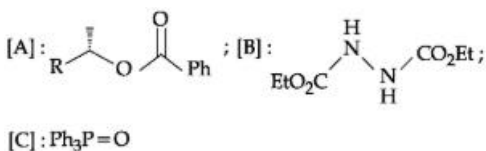
(A) ☐



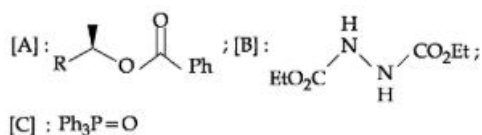
(B) ☐



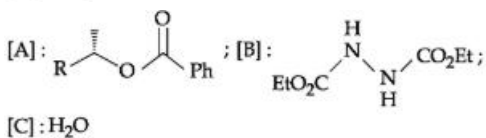
(C) ☐



(D) ☐

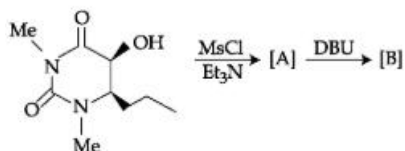


(E) ☐

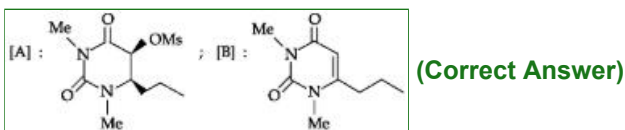


Question No.5 (Question Id - 25)

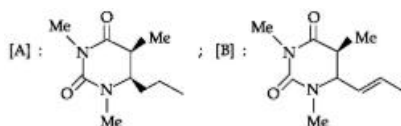
The following reaction steps are carried out to prepare a synthetic analogue of uracil. The products formed [A] and [B] are :



(A) ☐



(B) ☐



(C) ☐

Question No.6 (Question Id - 49)

For an hexagonal crystal system.

- (A) ☐ $a = b = c$; $\alpha = \beta = \gamma = 90^\circ$
 (B) ☒ $a = b \neq c$; $\alpha = \beta = 90^\circ$ $\gamma = 120^\circ$ (Correct Answer)
 (C) ☐ $a = b = c$; $\alpha = \beta = 90^\circ$ $\gamma = 120^\circ$
 (D) ☐ $a = b \neq c$; $\alpha = \beta = \gamma = 90^\circ$
 (E) ☐ $a \neq b \neq c$; $\alpha = \gamma = 90^\circ \neq \beta$

Question No.7 (Question Id - 38)

Release of O_2 from oxyhemoglobin is favoured by :

- (A) ☐ High pH, low conc. of CO_2 and high temperature
 (B) ☐ High pH, low conc. of CO_2 and low temperature
 (C) ☐ Low pH, low conc. of CO_2 and high temperature
 (D) ☐ High pH, high conc. of CO_2 and low temperature
 (E) ☒ Low pH, high conc. of CO_2 and high temperature (Correct Answer)

Question No.8 (Question Id - 40)

An excited atom has a mean life of 10^{-8} s and radiates a photon while coming down to the ground state. The inherent uncertainty in the frequency is [$h = 6.626 \times 10^{-34}$; Js]

- (A) ☐ $1.054 \times 10^{+34}$ Hz
 (B) ☐ 8×10^{-8} Hz
 (C) ☒ 8×10^6 Hz (Correct Answer)
 (D) ☐ 8×10^{-6} Hz
 (E) ☐ 1.054×10^6 Hz

Question No.9 (Question Id - 43)

The first line in the rotational spectrum of carbonmonoxide appears at frequency 3.8424 cm^{-1} . The C - O bond length will be :

[$N_A = 6.022 \times 10^{23}/\text{mol}$; $C = 3 \times 10^8 \text{ m/s}$]

- (A) ☐ 1.9 Å
 (B) ☐ 1.4 Å
 (C) ☐ 0.90 Å
 (D) ☒ 1.13 Å (Correct Answer)
 (E) ☐ 1.23 Å

Question No.10 (Question Id - 33)

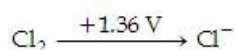
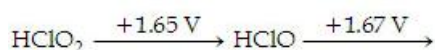
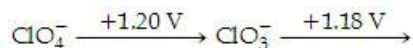
The CORRECT trend in ligand-to-metal charge transfer (LMCT) energies of the following metal tetraoxidoanions :

- (A) ☒ $VO_4^{3-} > CrO_4^{2-} > MnO_4^-$ and $ReO_4^- > TcO_4^- > MnO_4^-$ (Correct Answer)
 (B) ☐ $MnO_4^- > CrO_4^{2-} > VO_4^{3-}$ and $MnO_4^- > TcO_4^- > ReO_4^-$
 (C) ☐ $VO_4^{3-} > MnO_4^- > CrO_4^{2-}$ and $ReO_4^- > MnO_4^- > TcO_4^-$
 (D) ☐ $MnO_4^- > VO_4^{3-} > CrO_4^{2-}$ and $MnO_4^- > ReO_4^- > TcO_4^-$
 (E) ☐ $CrO_4^{2-} > MnO_4^- > VO_4^{3-}$ and $TcO_4^- > ReO_4^- > MnO_4^-$

Question No.11 (Question Id - 46)

For the reaction, $Ag + Fe(ClO_4)_3 \rightleftharpoons AgClO_4 + Fe(ClO_4)_2$, the equilibrium constant at $25^\circ C$ is 0.60.

The standard e.m.f. of a corresponding cell, $Ag | Ag^+ || Fe^{++} | Fe^{+++} Pt$ will be : [$F = 96500 \text{ C mol}^{-1}$;



Calculate the E^0 for the couple HClO_2 to Cl_2 in acidic medium.

- (A) ☐ +3.32 V
 (B) ☐ +1.11 V
 (C) ☐ +2.48 V
 (D) ☒ +1.66 V (Correct Answer)
 (E) ☐ +4.97 V

Question No.13 (Question Id - 47)

In a second order reaction of the type $\text{A} + \text{B} \rightarrow \text{P}$, initially the concentrations of reactants were $[\text{A}]_0 = 0.10 \text{ mol dm}^{-3}$ and $[\text{B}]_0 = 0.075 \text{ mol dm}^{-3}$. After 1 hr the concentration of B fell to $[\text{B}] = 0.04 \text{ mol dm}^{-3}$. The rate constant k of the reaction will be :

- (A) ☐ $2.20 \times 10^{-2} \text{ dm}^3 \text{ mol}^{-1} \text{ s}^{-1}$
 (B) ☐ $1.20 \times 10^{-3} \text{ dm}^3 \text{ mol}^{-1} \text{ s}^{-1}$
 (C) ☒ $2.20 \times 10^{-3} \text{ dm}^3 \text{ mol}^{-1} \text{ s}^{-1}$ (Correct Answer)
 (D) ☐ $2.20 \times 10^{-3} \text{ dm}^3 \text{ mol}^{-1}$
 (E) ☐ $1.20 \times 10^{-2} \text{ dm}^3 \text{ mol}^{-1} \text{ s}^{-1}$

Question No.14 (Question Id - 39)

An electron is confined to an one-dimension box of length 1\AA . The ground state energy will be : [$h = 6.626 \times 10^{-34} \text{ Js}$; $m = 9.11 \times 10^{-31} \text{ kg}$]

- (A) ☐ $6.024 \times 10^{18} \text{ J}$
 (B) ☒ $6.024 \times 10^{-18} \text{ J}$ (Correct Answer)
 (C) ☐ $6.024 \times 10^{18} \text{ k.cal}$
 (D) ☐ $6.024 \times 10^{-18} \text{ k.cal}$
 (E) ☐ $43.904 \times 10^{+17} \text{ k.cal}$

Question No.15 (Question Id - 34)

The ground terms for Cr^{2+} , Cr^{3+} and Fe^{2+} are :

- (A) ☒ ^5D , ^4F and ^5D (Correct Answer)
 (B) ☐ ^4F , ^5D and ^5D
 (C) ☐ ^3F , ^5D and ^5D
 (D) ☐ ^3F , ^6S and ^5D
 (E) ☐ ^3F , ^4F and ^5D

Question No.16 (Question Id - 19)

(S)-2-Phenylbutanal is reacted with Grignard reagent, methyl magnesium iodide. The absolute configuration of the chiral carbons in the product of the above reaction is :

- (A) ☐ 1 S, 3 S
 (B) ☒ 1 R, 2 R
 (C) ☐ 1 S, 2 R

- (A) ☐ electrocyclic ring opening ; $4\pi e^-$; conrotatory. (Correct Answer)
- (B) ☐ electrocyclic ring opening ; $2\pi e^-$; disrotatory.
- (C) ☐ cycloaddition, $6\pi e^-$, disrotatory
- (D) ☐ sigmatropic, $2\pi e^-$, (antara, antara)
- (E) ☐ sigmatropic, $4\pi e^-$, (supra, supra)

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Question No.18 (Question Id - 48)

The characteristic conditions of the Langmuir isotherm are :

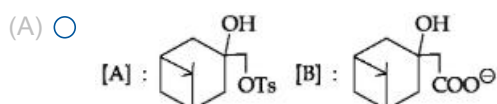
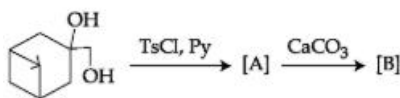
- A. Adsorption cannot proceed beyond monolayer coverage
- B. All sites are equivalent and the surface is uniform
- C. Adsorption can proceed beyond monolayer coverage
- D. All sites are non-equivalent

The correct option would be :

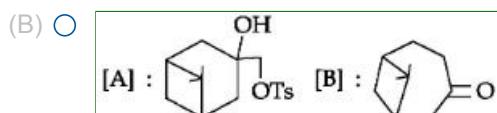
- (A) ☐ A and C
- (B) ☒ A and B (Correct Answer)
- (C) ☐ Only A
- (D) ☐ Only B
- (E) ☐ A, B and C

Question No.19 (Question Id - 21)

In the following reaction, predict the correct structures and identify the right statement :

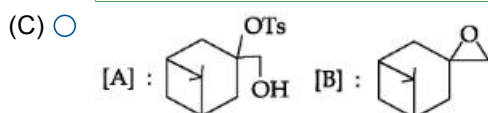


The carboxylate group is nucleophilically substituted.

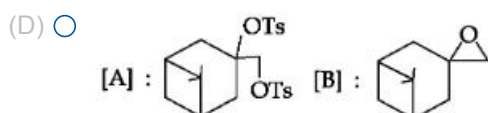


(Correct Answer)

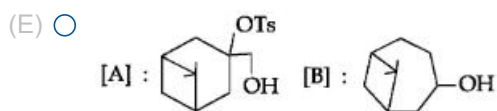
This is an example of a semipinacol rearrangement.



Selective tosylation of secondary alcohol and epoxide formation.



Tosylation with epoxide formation.



This is a Pinacol rearrangement.

- (A) ☐ $\text{LiBr} > \text{LiCl} > \text{LiF}$ and $\text{AgCl} > \text{Ag}_2\text{S} > \text{Ag}_2\text{O}$
 (B) ☐ $\text{LiF} > \text{LiCl} > \text{LiBr}$ and $\text{Ag}_2\text{O} > \text{Ag}_2\text{S} > \text{AgCl}$
 (C) ☒ $\text{LiBr} > \text{LiCl} > \text{LiF}$ and $\text{Ag}_2\text{O} > \text{AgCl} > \text{Ag}_2\text{S}$ (Correct Answer)
 (D) ☐ $\text{LiF} > \text{LiCl} > \text{LiBr}$ and $\text{Ag}_2\text{S} > \text{Ag}_2\text{O} > \text{AgCl}$
 (E) ☐ $\text{LiF} > \text{LiCl} > \text{LiBr}$ and $\text{AgCl} > \text{Ag}_2\text{O} > \text{Ag}_2\text{S}$

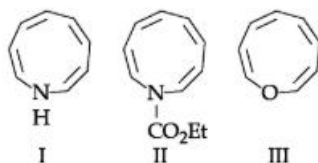
Question No.22 (Question Id - 44)

The difference in chemical potential between two regions of a system is $+9.1 \text{ kJ mol}^{-1}$. By how much does the Gibbs energy change when 0.10 mmol of a substance is transferred from one region to the other ?

- (A) ☐ $1.9 \times 10^{-3} \text{ kJ}$
 (B) ☐ $91.0 \times 10^{-3} \text{ kJ}$
 (C) ☐ $19 \times 10^{-3} \text{ kJ}$
 (D) ☐ $9.1 \times 10^{-3} \text{ kJ}$
 (E) ☒ $0.91 \times 10^{-3} \text{ kJ}$ (Correct Answer)

Question No.23 (Question Id - 17)

Predict the aromaticity, antiaromaticity or nonaromaticity in the following structures :



- (A) ☐ I : Antiaromatic ; II : Aromatic ; III : Aromatic
 (B) ☐ I : Aromatic ; II : Aromatic ; III : Aromatic
 (C) ☐ I : Nonaromatic ; II : Nonaromatic ; III : Nonaromatic
 (D) ☒ I : Aromatic ; II : Nonaromatic ; III : Nonaromatic (Correct Answer)
 (E) ☐ I : Antiaromatic ; II : Antiaromatic ; III : Antiaromatic

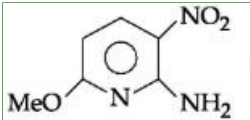
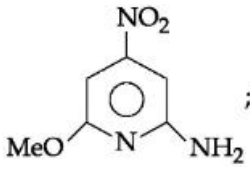
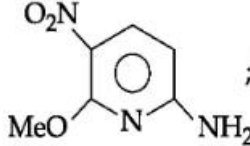
Question No.24 (Question Id - 45)

A sample consisting of 1.00 mol of perfect gas is expanded isothermally and reversibly at 20°C from 5 dm^3 to 15 dm^3 . The q of the process is :

[$R = 8.314 \text{ JK}^{-1} \text{ mol}^{-1}$]

- (A) ☐ $+0.982 \text{ kJ}$
 (B) ☐ -0.982 kJ
 (C) ☐ -26.8 kJ
 (D) ☐ -2.68 kJ
 (E) ☒ $+2.68 \text{ kJ}$ (Correct Answer)

Question No.25 (Question Id - 23)

- (C) ☐ ; electrophilic substitution (Correct Answer)
- (D) ☐ ; nucleophilic substitution
- (E) ☐ ; electrophilic substitution

Question No.26 (Question Id - 31)

Out of the following reactions, which one will yield metal nitride ?

- (A) ☐ $\text{NH}_4\text{Cl} + \text{NaNH}_2$
- (B) ☐ $\text{NH}_3(\text{aq}) + \text{NaOCl}$
- (C) ☐ $\text{Ca(s)} + \text{NH}_3(\text{l})$ (Correct Answer)
- (D) ☐ $\text{NaNH}_2 + \text{NaNO}_3$ at elevated temperatures
- (E) ☐ $\text{NaNH}_2 + \text{N}_2\text{O}$ at elevated temperatures

Question No.27 (Question Id - 36)

Arrange the following in the decreasing order of Rh–C bond lengths.

- A. Rh (CO) (Cl) (PPh₃)₂
- B. Rh (CO) (Cl) (PEt₃)₂
- C. Rh (CO) (Cl) [P(C₆F₅)₃]₂
- D. Rh (CO) (Cl) (PMePh₂)₂

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

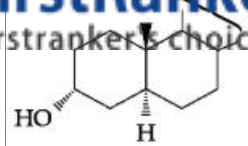
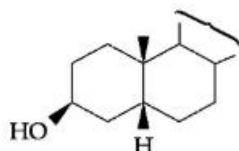
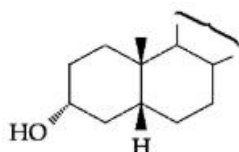
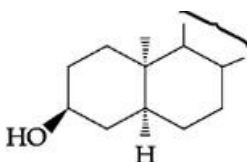
- (A) ☐ B > D > A > C
- (B) ☐ A > D > B > C
- (C) ☐ D > A > B > C
- (D) ☐ C > B > A > D
- (E) ☐ C > A > D > B (Correct Answer)

Question No.28 (Question Id - 42)

Asymmetric top molecule among the following :

- (A) ☐ CH₂CHCl (Correct Answer)
- (B) ☐ BCl₃
- (C) ☐ CH₃Cl
- (D) ☐ OCS
- (E) ☐ CCl₄

Question No.29 (Question Id - 20)

(C) ☐(D) ☐(E) ☐**Question No.30 (Question Id - 28)**

Considering the halides and oxides of elements from the periodic table, which statement is correct from the following :

- (A) ☐ Metals form basic oxides and high oxidation state halides of transition metals tend to be ionic.
- (B) ☒ **Metals form basic oxides and low oxidation state halides of transition metals tend to be ionic. (Correct Answer)**
- (C) ☐ Non-metals form acidic oxides and p-block halides are predominantly ionic.
- (D) ☐ Non-metals form basic oxides and p-block halides are predominantly covalent.
- (E) ☐ Metals form acidic oxides and s-block oxides are predominantly ionic.

Question No.31 (Question Id - 18)

Elucidate the plausible molecular structure of a compound with molecular formula $C_7H_{12}O_4$, using following spectroscopic data :

IR (cm^{-1}) : 2990 - 2880, 1735, 1150, 1035.

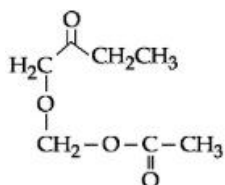
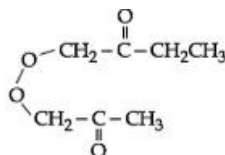
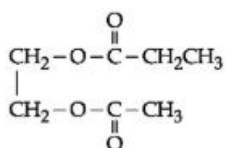
1H NMR : δ 1.28 (6 H, triplet)

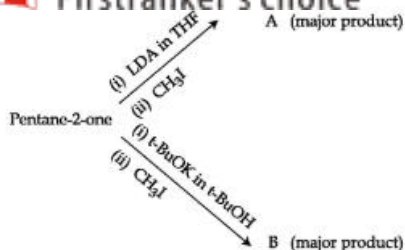
δ 3.23 (4 H, quartet)

δ 4.16 (2 H, singlet)

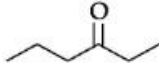
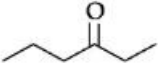
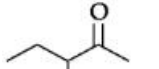
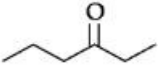
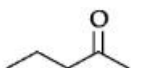
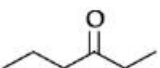
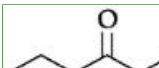
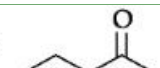
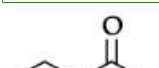
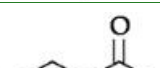
Mass spectrum :

m/z : 161, 160, 133, 115, 43, 29

(A) ☐(B) ☐(C) ☐(D) ☐



The structures of A and B are respectively.

- (A) ☐  and 
- (B) ☐  and 
- (C) ☐  and 
- (D) ☒  and  (Correct Answer)
- (E) ☐  and 

Question No.33 (Question Id - 50)

The fraction condensed (ρ) of a polymer by stepwise process with degree of polymerization $\langle N \rangle = 251$ would be :

- (A) ☐ 9.96
- (B) ☒ 0.996 (Correct Answer)
- (C) ☐ 1.96
- (D) ☐ 2.0
- (E) ☐ 0.0996

Question No.34 (Question Id - 37)

The bond order of the metal-metal bonds in $[\text{Re}_2\text{Cl}_4(\text{P}(\text{C}_2\text{H}_5)_3)_4]$, $[\text{Re}_2\text{Cl}_4(\text{P}(\text{C}_2\text{H}_5)_2\text{Ph})_4]^\oplus$ and $[\text{Re}_2\text{Cl}_4(\text{P}(\text{C}_2\text{H}_5)\text{Ph}_2)_4]^{2+}$, respectively.

- (A) ☐ 4.0, 3.5 and 3.0
- (B) ☐ 3.5, 3.0 and 4.0
- (C) ☐ 4.0, 3.0 and 3.5
- (D) ☒ 3.0, 3.5 and 4.0 (Correct Answer)
- (E) ☐ 3.0, 4.0 and 3.5

Question No.35 (Question Id - 35)

Among the following statements, which one characterizes the electronic absorption spectra of lanthanoid ions :

- (A) ☐ Sharp absorptions due to the strong interaction of the f-orbitals with the ligand vibration.
- (B) ☒ Spectra that are independent of the ligand type and coordination number. (Correct Answer)
- (C) ☐ Molar absorption coefficients are comparable with d-block elements.
- (D) ☐ Numerous absorptions due to orbital mixing.
- (E) ☐ Numerous absorptions due to the capability to show higher coordination number.

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