PAPER SOLUTION

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Aryan Agarwal
Founder and CEO
CVPS INTEGRATED STAR COURSE

#Q. The plot of $\log_{10} K$ vs $\frac{1}{T}$ gives a straight line. The intercept and slope respectively are

A $c = \log A,\ m = -\dfrac{E_a}{2.303R}$

B $c = -\dfrac{E_a}{2.303R},\ m = \log A$

C $c = -\log A,\ m = -\dfrac{E_a}{2.303R}$

D $c = \log A,\ m = \dfrac{E_a}{2.303R}$

Ans. (A)

#Q. Consider the following electromagnetic waves
Wavelength of A = 400nm
Frequency of B = 10^{16} sec^{-1}
Wave number of C = 10^4 cm^{-1}
Order of energies is :

(A) A > B > C

(B) B > A > C

(C) B > C > A

(D) C > A > B

Ans. (B)

#Q. Which of the following order is correct.

(A) HF > HI > HBr > HCl (Boiling point)

(B) HF > HI > HBR > HCl (Melting point)

(C) HI > HF > HBr > HCl (Boiling point)

(D) HI > HBr > HF > HCl (Melting point)

Ans. (A)

#Q. Consider a reaction $A \rightleftharpoons B$. At 'T' K, the equilibrium concentration of A and B are 0.3 M and 0.315 M. Now, 0.1 mol of A is added to the flask of 1 L, then equilibrium constant and equilibrium concentration of B are

A 1.05, 0.35 M

B 0.95, 0.37 M

C 1.05, 0.37 M

D 0.95, 0.35 M

Ans. (C)

#Q. The sum of valence e⁻ in element with most and least metallic character among the following is :
N, P, Cl, S, O and F

Ans. (12)

#Q. **Match the isostructural species**

	Column-I		Column-II
(a)	XeO_3	(p)	BrF_5
(b)	XeF_2	(q)	NH_3
(c)	XeO_2F_2	(r)	I_3^-
(d)	$XeOF_4$	(s)	SF_4

A a— q, b—r, c—s, d —p

B a — p, b —q, c—s, d —p

C a —q, b—r, c— p, d —s

D a—p, b—q, c—r, d—s

Ans. (A)

#Q. In 'S' estimation, 0.314 g of organic compound gave 0.4813 g of barium sulphate. What is % of 'S' in organic compound?
(Report to Nearest Integer).

Ans. (21)

#Q. Diamagnetic species among the following complexes is

A $[MnBr_4]^{2-}$

B $[Cu(H_2O)_6]^{2+}$

C $[Ni(CN)_4]^{2-}$

D $[Ni(H_2O)_6]^{2+}$

Ans. (C)

#Q. Correct statement about —NO_2 group is
(A) Ring deactivating group in electrophilic substitution
(B) Ring activating group in electrophilic substitution
(C) Activating for aromatic nucleophilic substitution in Aryl halides
(D) Deactivating for aromatic nucleophilic substitution in Aryl halides.

(A) A, C are correct statement

(B) B, D are correct

(C) A, D are correct

(D) B, C are correct

**Ans. (A)**

#Q. The major organic product of which of the following reaction is incorrectly represented?

A

CH_3 → CH_2Br ; $\xrightarrow[\Delta]{Br_2}$

B

CH_3 → CH_2Br ; $\xrightarrow[CCl_4]{Br_2}$

C

CH_3 ; $\xrightarrow[dark]{Br_2/Fe}$ ortho and para bromotoluene

D

$N_2{}^+Cl^-$ → Br ; $\xrightarrow[HBr]{CuBr}$
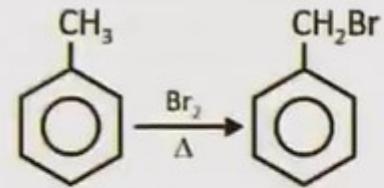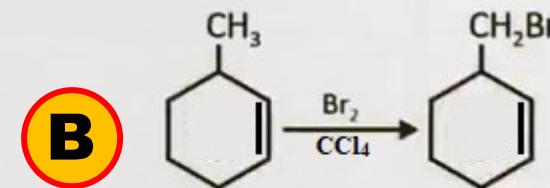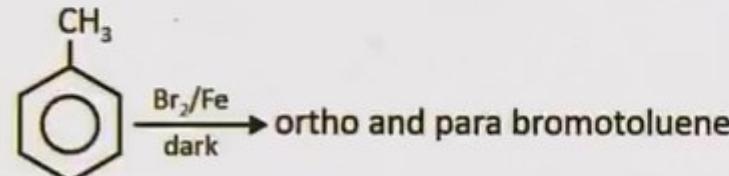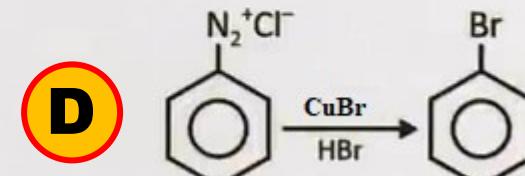
Ans. (B)

#Q. Which of the following compounds on reacting with Hinsberg Reagent forms an alkali insoluble product.
(A) Ethanamine
(B) N-Methylaniline
(C) N-Ethyl-N-Methylaniline
(D) N-Methylethanamine
(E) N-Phenylaniline
(F) Aniline

A   A, C, D, E only

B   B, C, D & E only

C   B, D and E only

D   A, C, F only

Ans. (C)

#Q. Among Sc^{3+}, Cr^{2+}, Mn^{3+}, CO^{3+} number of isoelectronic species are 'n'. 'n' moles of AgCl is obtained upon reaction with excess of $AgNO_3$ with 1 mol of $Co(en)_2NH_3Cl_3$. Number of t_{2g} electrons in the complex are

Ans. (6)

#Q. An alpha particle and proton are accelerated in a discharge tube under same potential difference of 200 Kev. The debroglie wavelength of proton is $x\sqrt{2}$ times of debroglie wavelength of α-particle. The value of x is.

Ans. (2)