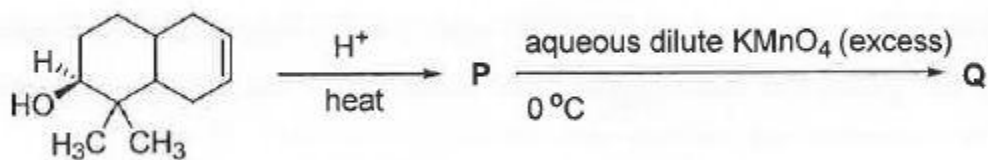
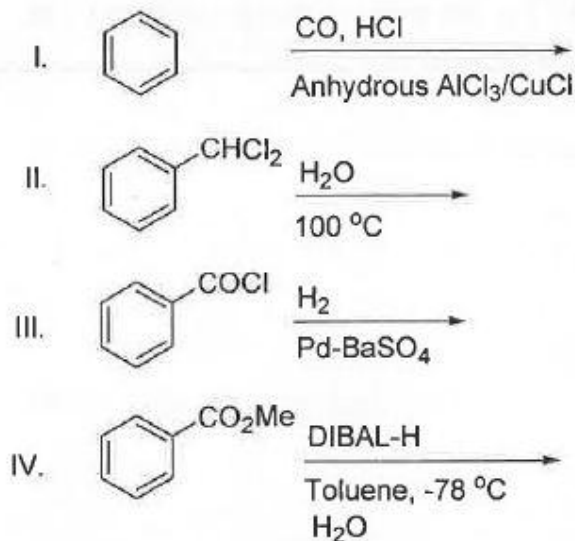


Question 1

The number of hydroxyl group(s) in Q is



Among the following, the number of reaction(s) that produce(s) benzaldehyde is



Question 2

In the complex acetylbromidodicarbonylbis(triethylphosphine)iron(II), the number of Fe-C bond(s) is

Question 3

Among the complex ions, $[\text{Co}(\text{NH}_2\text{-CH}_2\text{-CH}_2\text{-NH}_2)_2\text{Cl}_2]^+$, $[\text{CrCl}_2(\text{C}_2\text{O}_4)_2]^{3-}$, $[\text{Fe}(\text{H}_2\text{O})_4(\text{OH})_2]^+$, $[\text{Fe}(\text{NH}_3)_2(\text{CN})_4]^-$, $[\text{Co}(\text{NH}_2\text{-CH}_2\text{-CH}_2\text{-NH}_2)_2(\text{NH}_3)\text{Cl}]^{2+}$ and $[\text{Co}(\text{NH}_3)_4(\text{H}_2\text{O})\text{Cl}]^{2+}$, the number of complex ion(s) that show(s) *cis-trans* isomerism is

Question 4

Three moles of B_2H_6 are completely reacted with methanol. The number of moles of boron containing product formed is

Question 5

The molar conductivity of a solution of a weak acid HX (0.01 M) is 10 times smaller than the molar conductivity of a solution of a weak acid HY (0.10 M). If $\lambda_X^0 \approx \lambda_Y^0$, the difference in their pK_a values, $pK_a(HX) - pK_a(HY)$, is (consider degree of ionization of both acids to be $\ll 1$)

Question 6

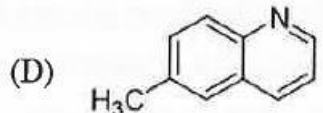
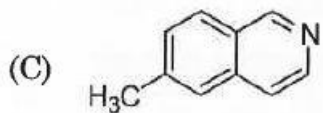
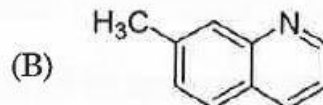
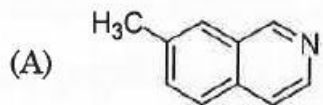
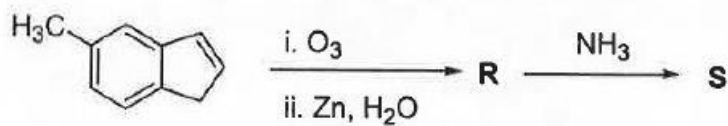
A closed vessel with rigid walls contains 1 mol of ${}^{238}_{92}\text{U}$ and 1 mol of air at 298 K. Considering complete decay of ${}^{238}_{92}\text{U}$ to ${}^{206}_{82}\text{Pb}$, the ratio of the final pressure to the initial pressure of the system at 298 K is

Question 7

In dilute aqueous H_2SO_4 , the complex diaquodioxalatoferate(II) is oxidized by MnO_4^- . For this reaction, the ratio of the rate of change of $[H^+]$ to the rate of change of $[MnO_4^-]$ is

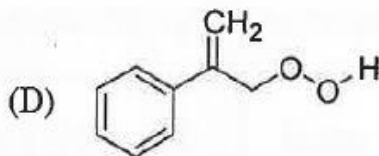
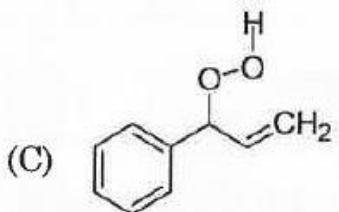
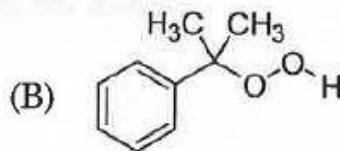
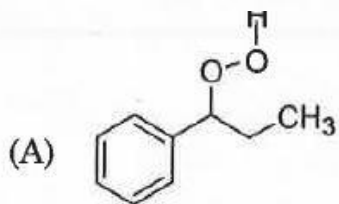
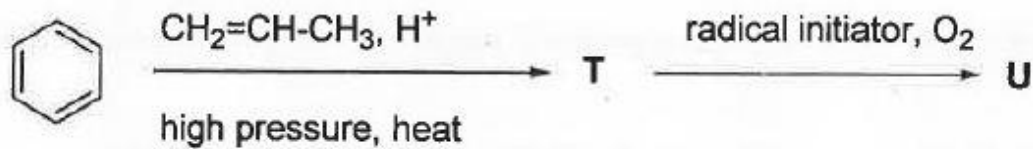
Question 7

In the following reactions, the product **S** is



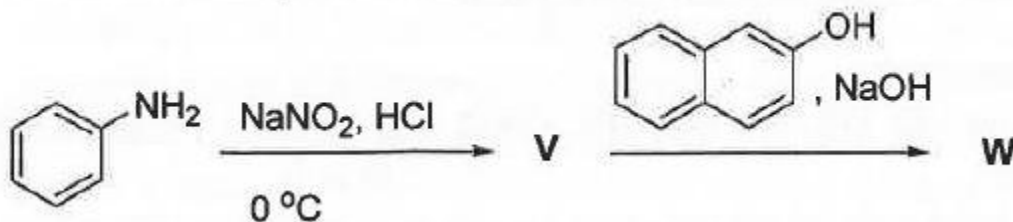
Question 8

The major product **U** in the following reactions is



Question 9

In the following reactions, the major product W is



- (A)
- (B)
- (C)
- (D)

Question 10

The correct statement(s) regarding, (i) HClO , (ii) HClO_2 , (iii) HClO_3 and (iv) HClO_4 , is(are)

- (A) The number of $\text{Cl}=\text{O}$ bonds in (ii) and (iii) together is two
- (B) The number of lone pairs of electrons on Cl in (ii) and (iii) together is three
- (C) The hybridization of Cl in (iv) is sp^3
- (D) Amongst (i) to (iv), the strongest acid is (i)

Question 11

The pair(s) of ions where BOTH the ions are precipitated upon passing H_2S gas in presence of dilute HCl , is(are)

- (A) Ba^{2+} , Zn^{2+} (B) Bi^{3+} , Fe^{3+} (C) Cu^{2+} , Pb^{2+} (D) Hg^{2+} , Bi^{3+}

Question 12

Under hydrolytic conditions, the compounds used for preparation of linear polymer and for chain termination, respectively, are

- (A) CH_3SiCl_3 and $\text{Si}(\text{CH}_3)_4$ (B) $(\text{CH}_3)_2\text{SiCl}_2$ and $(\text{CH}_3)_3\text{SiCl}$
(C) $(\text{CH}_3)_2\text{SiCl}_2$ and CH_3SiCl_3 (D) SiCl_4 and $(\text{CH}_3)_3\text{SiCl}$

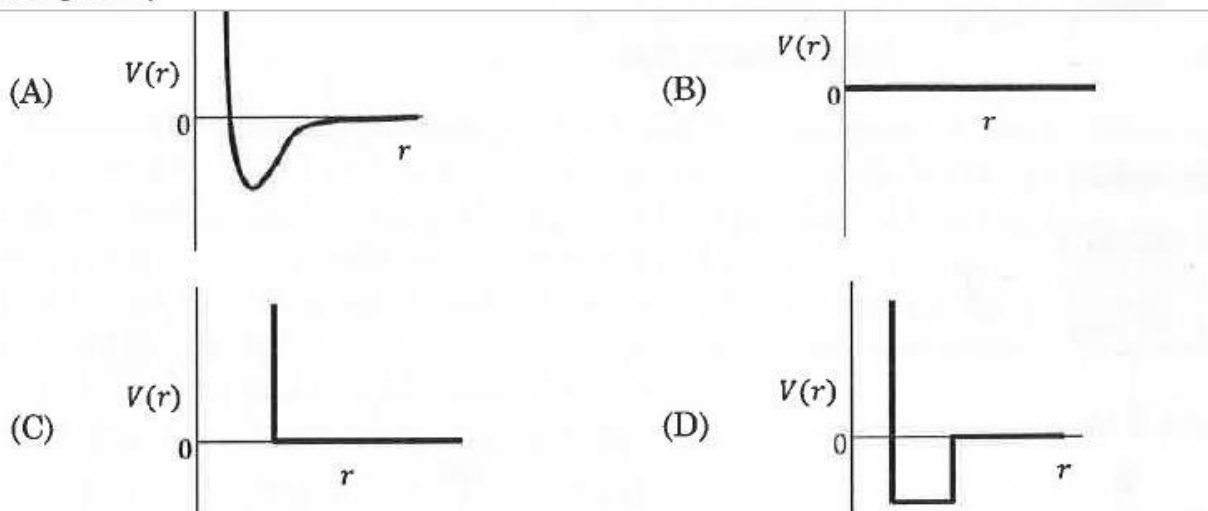
Question 13

When O_2 is adsorbed on a metallic surface, electron transfer occurs from the metal to O_2 . The **TRUE** statement(s) regarding this adsorption is(are)

- (A) O_2 is physisorbed (B) heat is released
(C) occupancy of π_{2p}^* of O_2 is increased (D) bond length of O_2 is increased

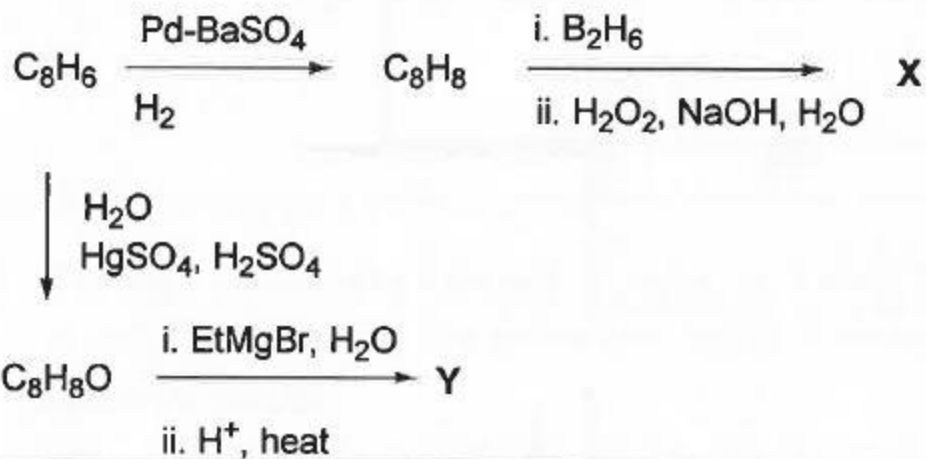
Question 14

One mole of a monoatomic real gas satisfies the equation $p(V-b) = RT$ where b is a constant. The relationship of interatomic potential $V(r)$ and interatomic distance r for the gas is given by



PARAGRAPH 1

In the following reactions



Question 15

Compound X is



Question 16

The major compound Y is



