CHEMISTRY

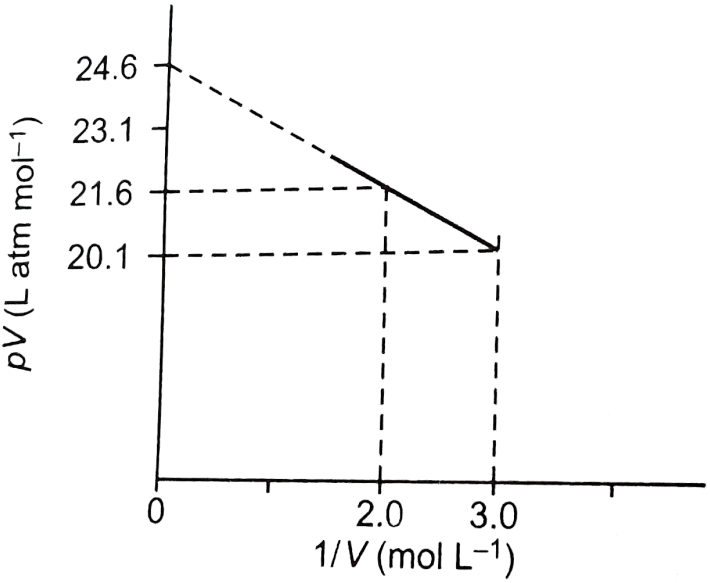
BOOKS - NTA MOCK TESTS

NTA JEE MOCK TEST 40

Chemistry

1. For one mole of a van der Waals' gas when $b = 0$ and $T = 300K$, the $pVvs1/V$ plot is shown below. The value of the vander Waals' constant a

(atm $Lmol^{-2}$)



A. 1.5

B. 2.5

C. 1.75

D. 1

Answer: A

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2. The kinetic energy of an electron in the second Bohr orbit of a hydrogen atom is [a_0 is Bohr radius] :

A. $\frac{h^2}{64\pi^2 m a_0^2}$

B. $\frac{h^2}{32\pi^2 m a_0^2}$

C. $\frac{h^2}{16\pi^2 m a_0^2}$

D. $\frac{h^2}{4\pi^2 m a_0^2}$

Answer: B

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3. With respect to graphite and diamond, which of the statements given below are correct?

(1) Graphite is harder than diamond.

(2) Graphite has higher electrical conductivity than diamond.

(3) Graphite has higher thermal conductivity than diamond.

(4)Graphite has higher $C - C$ bond order than diamond.

A. 1, 2

B. 1, 2, 3

C. 1, 3, 4

D. 2, 3, 4

Answer: C

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4. Two moles of an ideal gas is expanded isothermally and reversibly from 1 liter to 10 liter at $300K$. The enthalpy change (in kJ) for the process

A. 11.4 kJ

B. `-11.4 kJ

C. 0 kJ

D. 4. 8 kJ

Answer: C

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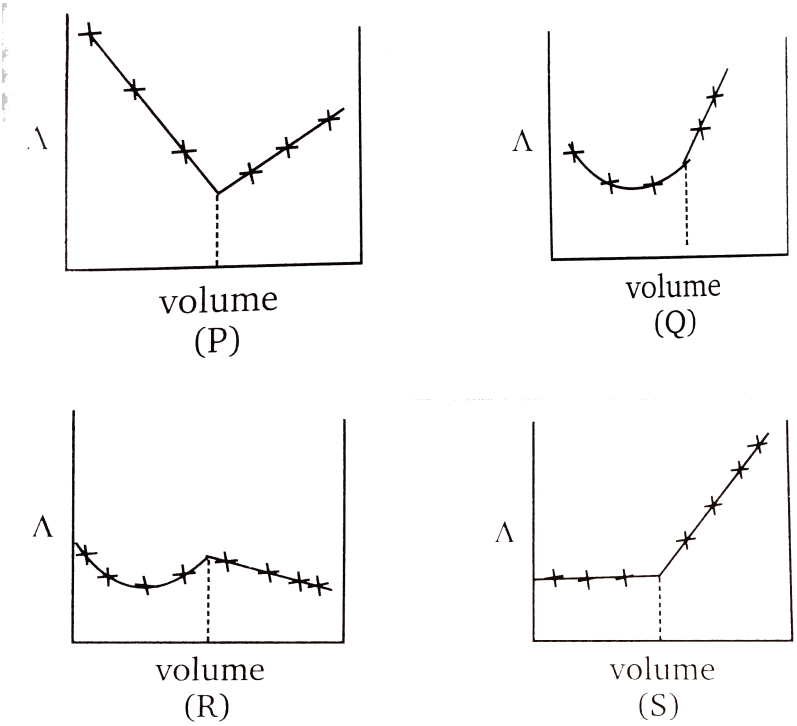
5. $AgNO_3(aq.)$ was added to an aqeous KCl solution gradually and the conductivity of the solution was measured. The plot of conductance (Λ) versus the volume of $AgNO_3$ is :



A. (P)

B. (Q)

C. (R)

D. (S)

Answer: D

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6. The bond dissociation energy of $B-F$ in BF_3 is $646\,\mathrm{kJ\,mol^{-1}}$ whereas that of $C-F$ in CF_4 is $515\,\mathrm{kJ\,mol^{-1}}$. The correct reason for higher $B-F$ bond dissociation energy as compared to that of $C-F$ is

A. stonger σ bond between B and F in BF_3 as compared to that between C and F in CF_4

B. significant $p\pi-p\pi$ interaction between B and F in BF_3 whereas there is no possibility of such interaction between C and F I CF_4

C. lower degree of $p\pi-p\pi$ interaction between B and FBF_3 than that between C and F CF_4

D. smaller size of B - atom as compared to that of C - atom

Answer: B

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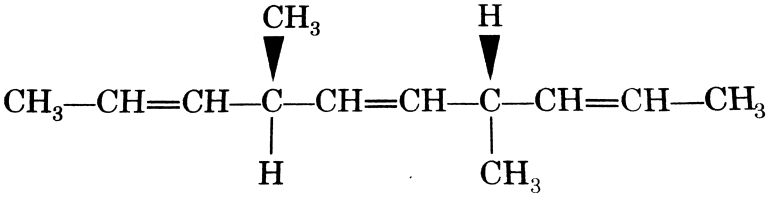
7. The number of optically active products obtained from the complete ozonolysis of the given compound



is :

A. 4

B. 2

C. 0

D. 1

Answer: C

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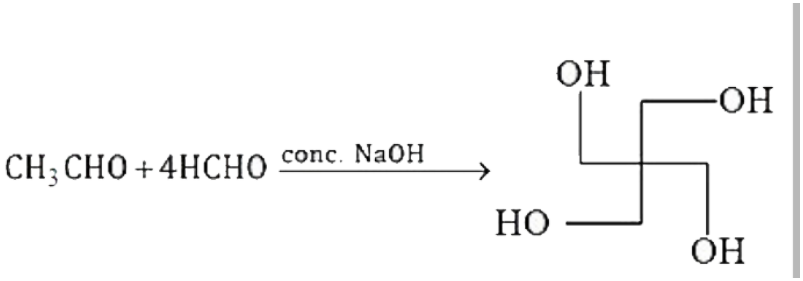
8. The number of aldol reaction(s) that occurs in the given transformation is



A. 4

B. 3

C. 2

D. 1

Answer: B

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9. The hyperconjugative stabilities of tert-butyl cation and 2-butene, respectively, are due to

A. $\sigma \rightarrow p$ (empty) and $\sigma \rightarrow \pi^*$ electron delocalisations.

B. $\sigma \rightarrow \sigma^*$ and $\sigma \rightarrow \pi$ electron delocalisations.

C. $\sigma \rightarrow p$ (filled) ad $\sigma \rightarrow \pi$ electron delocalisations.

D. p(filled) $\rightarrow \sigma^*$ and $\sigma \rightarrow \pi^*$ electron delocalisations.

Answer: A

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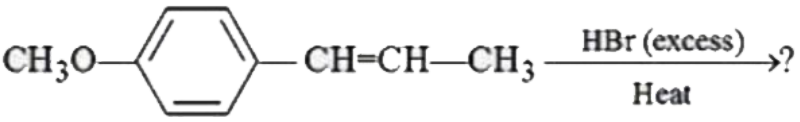
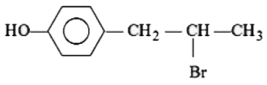
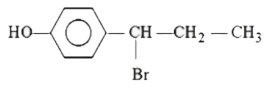
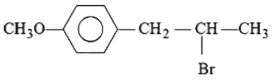
10. The major product in the follo with conversion is

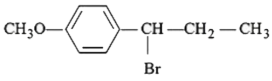


A.



B. 

C. 

D. 

Answer: B

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11. Nitration of aniline in strong acidic medium also gives m-nitroaniline because

A. In absence of substitutents nitro group always goes to m - position

B. In electrophilic substitution reactions amino group is meta directive.

C. Inspite of substitutents nitro group always goes to only m - position.

D. In acidic (strong) medium aniline is present as anilinium ion.

Answer: D

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12. 1g of a non-volatile non-electrolyte solute is dissolved in 100g of two different solvents A and B whose ebullioscopic constants are in the ratio of 1 : 5. The ratio of the elevation in their boiling points, $\frac{\Delta T_b(A)}{\Delta T_b(B)}$ is

A. $5:1$

B. $10:1$

C. $1:5$

D. $1:3$

Answer: C

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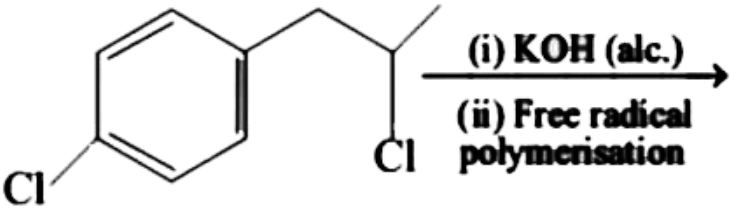
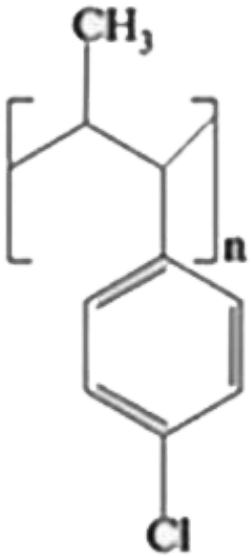
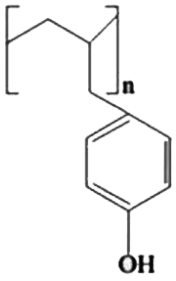
13. The major product of the following reaction is



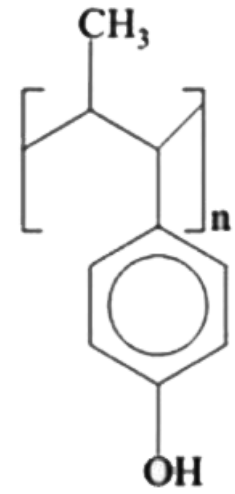
A.



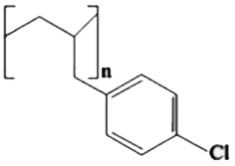
B.



C.



D.



Answer: A

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14. Amylopectin in composed of:

A. $\alpha - D -$ glucose with $C_1 - C_4$ and $C_1 - C_6$ linkage

B. $\alpha - D -$ glucose with $C_1 - C_4$ and $C_2 - C_6$ linkage

C. $\beta - D -$ glucose with $C_1 - C_4$ and $C_2 - C_6$ linkage

D. $\beta - D -$ glucose with $C_1 - C_4$ and $C_1 - C_6$ linkage

Answer: A

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15. Extra pure N_2 can be obtained by heating

A. NH_4NO_3

B. $Ba(N_3)_2$

C. $(NH_4)_2Cr_2O_7$

D. $NH_3 \text{ with } CuO$

Answer: B

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16. If the dipole moment of AB molecule is given by 1.2 D and A - B the bond length is 1Å then $\%$ ionic character of the bond is [Given : 1 debye $= 10^{-18}$ esu. Cm]

A. 75

B. 50

C. 60

D. 25

Answer: D

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17. Reduction of metal centre in aqueous permanganate ion involves

(1) 5 electrons in neutral medium

(2) 5 electrons in acidic medium

(3) 3 electrons in neutral medium

(4) 3 electrons in alkaline medium

A. 1, 2

B. 2, 3

C. 1, 3

D. 2, 3, 4

Answer: B

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18. The equilibrium $Cu^0 + Cu^{||} \Leftrightarrow 2Cu^{|}$

In the aqueous medium at $25^\circ C$ shifts towards the left in the presence of

(1) Cl^- (2) CN^- (3) SCN^- (4) NO_3^-

A. 1, 2

B. 2, 3

C. 1, 2, 3

D. 2, 3, 4

Answer: C

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19. The correct order of the spin - only magnetic moments of the following complexes is

(I) $\left[Cr(H_2O)_5\right]Br_2$

(II) $Na_4\left[Fe(CN)_6\right]$

(III) $Na_3\left[Fe(C_2O_4)_3\right](\Delta_0 > P)$

(IV) $(Et_4N)_4[CoCl_4]$

A. (I) gt (IV) gt (III) gt (II)

B. (II) $\approx$ (I) gt (IV) gt (III)

C. (III) gt (I) gt (IV) gt (III)

D. (III) gt (I) gt (II) gt (IV)

Answer: A

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20. The volume (in mL) of $0.1M AgNO_3$ required for complete precipitation of chloride ions present in $30mL$ of $0.01M$ solution of $\left[Cr(H_2O)_5Cl\right]Cl_2$, as silver chloride is close to:

A. 4

B. 8

C. 6

D. 9

Answer: C

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21. In 1 L saturated solution of $AgCl\left[K_{sp}(AgCl) = 1.6 \times 10^{-19}\right]$, 0.1 mol of $CuCl\left[K_{sp}(CuCl) = 1.0 \times\right.$ is added. The resultant concentration of Ag^+ in the solution is 1.6×10^{-x}. The value of "x" is

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22. $29.2\,\%\,(w/w)HCl$ stock, solution has a density of $1.25gmL^{-1}$. The molecular weight of HCl is $36.5gmol^{-1}$. The volume (mL) of stock solution required to prepare a $200mL$ solution of $0.4MHCl$ is :

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23. An organic compound undergoes first decompoistion. The time taken for its decompoistion to $1/8$ and $1/10$ of its initial concentration are $t_{1/8}$ and $t_{1/10}$, respectively. What is the value of $\frac{[t_{1/8}]}{[t_{1/10}]} \times 10$? $(\log_{10} 2 = 0.3)$

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24. The difference in the oxidation states of the two types of sulphur atoms in $Na_2S_4O_6$ is :

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25. The number of $N - CH_2 - N$ bonds in urotropine is

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