CHEMISTRY

BOOKS - NTA MOCK TESTS

NTA JEE MOCK TEST 35

Chemistry

1. The radial wave equation for hydrogen of radial nodes from nucleus are:

$$\Psi_{1s} = \frac{1}{16\sqrt{4}}\left(\frac{1}{a_0}\right)^{3/2}\left[(\mathrm{x}-1)\left(\mathrm{x}^2-8\mathrm{x}+12\right)\right]e^{-x/2}$$

where, $x = 2r/a_0$, a_0 = radius of first Bohr orbit

The minimum and maximum position of radial nodes from nucleus are:

A. $a_o, 3a_o$

B. $0.5a_o, 3a_o$

C. $0.5a_o, a_o$

D. $0.5a_o, 4a_o$

Answer: B

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2. Acetamide is treated separately with the following reagents. Which one of these would give methylamine ?

A. PCl_5

B. Br_2 and $NaOH$

C. P_4O_{10}

D. $LiAlH_4$

Answer: B

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3. $D - \text{glucose} \xrightarrow{\text{Tollen's reagent}} (A),$

$D - \text{glucose} \xrightarrow{Br_2 - \text{water}} (B)$

(A) and (B) are :

A. gluconic acid, gluconic acid

B. glucaric acid, gluconic acid

C. salt of gluconic acid, gluconic acid

D. salt of gluconic acid, glucaric acid

Answer: C

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4. Alkaline earth metal nitrates on heating decompose to give :

A. $M(NO_2)_2$ and O_2 only

B. MO, N_2 and O_2

C. MO, NO_2 and O_2

D. MO and NO_2 only

Answer: C

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5. The degree of dissociation of acetic acid in a 0.1 M solution is 1.0×10^{-2}. The pK_a of acetic acid value.

A. 3

B. 4

C. 5

D. 6

Answer: C

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6. For the reaction

$$5Br^{-}(aq) + BrO_3^{-}(aq) + 6H^{+}(aq) \rightarrow 3Br_2(aq) + 3H_2O(l)$$

the reate expression was found to be

$$-\frac{d[BrO^{3-}]}{dt} = k[Br^{-}][H^{+}]^2[BrO_3^{-}]$$

Which of the following statements is /are correct?

I. Doubling the intial concentration of all the reactants will increase the reaction rate by a factor of 8.

II. Unit of rate constant of the reaction in a buffer solution is $\min^{-1}$

III. Doubling the concentration of all the reactants at the same time will increase the reaction rate by a factor of 16

IV. rate of conversion of BrO_3^- and rate of disappearance of Br^- are the same

A. I and II

B. II and III

C. II and IV

D. III only

Answer: D

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7. Polyvinyl alcohol is an important polymer. The structure is given below

$$\left(-CH_2-\underset{\underset{|}{OH}}{CH}-CH_2-\underset{\underset{|}{OH}}{CH}-CH_2-\underset{\underset{|}{OH}}{CH}- \right)$$

It is prepared by polymerization of

A. $CH_2 = CH - OH$

B. $CH_2 = CH - OCOCH_3$, followed by hydrolysis

C. $CH_2 = CH - CN$, followed by hydrolysis

D. $CH_2 = CH - COOCH_3$, followed by hydrolysis

Answer: B

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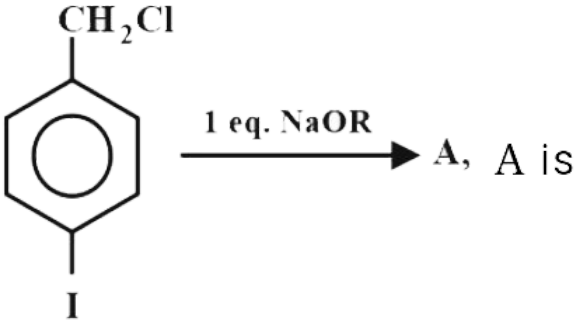
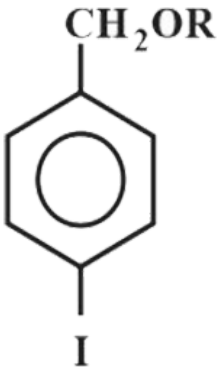
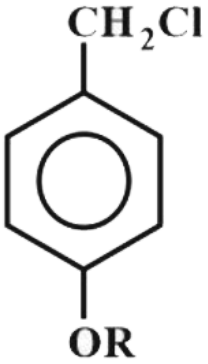
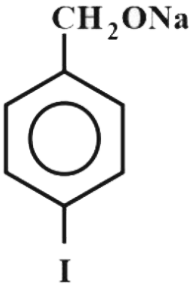
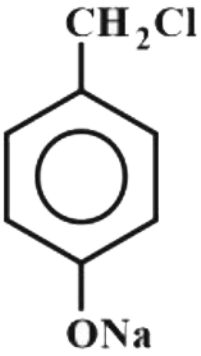
8.



A. 

B. 

C. 

D. 

Answer: A

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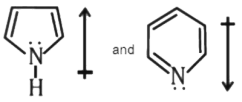
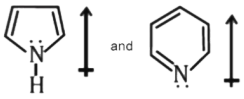
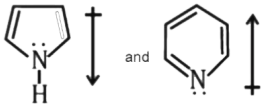
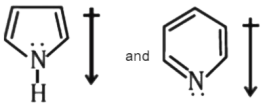
9. The correct orientation of dipoles in pyrrole and pyridine is

A. 

B. 

C. 

D. 

Answer: A

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10. Upon long standing concetrated HNO_3

A. remains colourless, but gives out NO

B. turns yellow brown due to formation of NO_2

C. turns yellow brown due to the formation of N_2O_4

D. remains colourless, but gives N_2O

Answer: B

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11. In which of the following crystals alternate tetrahedral voids are occupied?

A. $NaCl$

B. ZnS

C. CaF_2

D. Na_2O

Answer: B

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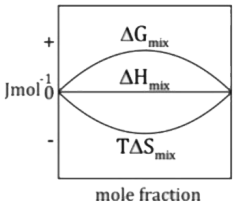
12. Which of the following represents correcty the changes in thermodynamic properties during the formation of 1 mole of an ideal binary solution :

A.



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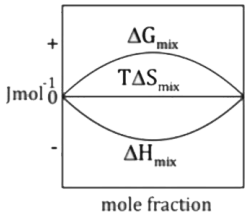
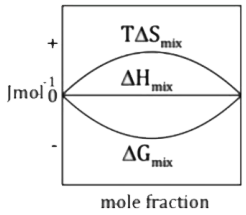
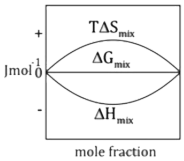


C.



D.



Answer: C

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13. What represents the best method for converting a carboxylic acid to an aldehyde?

A. Convert the acid to an acid chloride, and react the acid chloride with water.

B. Reduce the acid with $LiAlH_4$

C. Convert the acid to an acid chloride, and reduce the acid chloride with lithium aluminium tri (t - butoxy) hydride.

D. Convert the acid to an acid chloride, react the acid chloride with a Grignard reagent, and reduce the product with $LiAlH_4$.

Answer: C

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14. Aluminum carbide (Al_4C_3) liberates methane on treatment with water. The grams of aluminium carbide required to produce 11.2 L of methane under STP coniditions is [Given Al =27]

A. 48

B. 72

C. 144

D. 24

Answer: D

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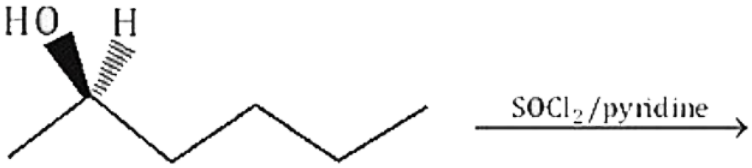
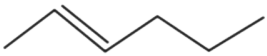
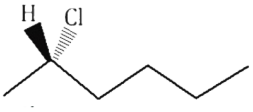
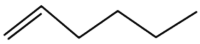
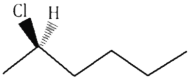
15. Give the major product of the following reaction



A. 

B. 

C. 

D. 

Answer: B

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16. Which of the following is correct?

A. Vinyl chloride is more reactive than ethyl chloride in S_{N^2}

B. Vinyl chloride is more reactive than ethyl chloride in S_{N^1}

C. allyl chloride is less reactive than n - propyl chloride in S_{N^1}

D. allyl chloride is more reactive than n - propyl chloride in S_{N^2}

Answer: D

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17. The van der Waals equation for one mole of a real gas can be written as $\left(P + \frac{a}{v^2}(V - b) = RT.\right.$ For the gases $H_2, NH_3,$ and CH_4, the value of 'a' $\text{bar L}^{-2}\text{mol}^{-2}$ are 0.2453, 4.170 and 2.253` respectively.

Which of the following can be inferred from the 'a' values?

A. NH_3 can be most easily liquified

B. H_2 can be most easily liquified

C. value of 'a' for CH_4 is less than that of NH_3 because it has the lower molar mass

D. intermolecular forces are the strongest in hydrogen

Answer: A

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18. For the reaction

$2CO(g) + O_2(g) \rightarrow 2CO_2, \Delta H = -500kJ.$

Two moles of CO and one mole of O_2 are taken in a container of volume 2 L. They completely from two moles of CO_2, the gas deviate appreciably from ideal behaviour. If pressure in vessel change from 35 to 20 atm. Find the magnitude of $\Delta U \text{ at } 500K$. (Assume 1 L - atom = 0.1 kJ)

A. 503 kJ

B. 400 kJ

C. 480 kJ

D. 320 kJ

Answer: A

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19. There are four complexes of Ni. Select the complexes/es which will be attracted by magnetic field :

(I) $\left[Ni(CN)_4\right]^{2-}$ (II) $\left[NiCl_4\right]^{2-}$ (III) $\left[Ni(CO)_4\right]$ (IV) $\left[Ni(NH_3)_6\right]^{2+}$

A. I only

B. II only

C. II, III and IV

D. II and IV

Answer: D

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20. A mixture of three alkyl chloride $CH_3Cl, CH_3CH_2Cl, CH_3CH_2CH_2Cl$ under goes Wurtz coupling reaction. The product contains ,

A. Ethane, pentane, hexane only

B. Propane, pentane, butane only

C. Ethane, Propane, pentane, butane

D. Ethane, Propane, butane, pentane, hexane

Answer: D

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21. A cell contains two hydrogen electrodes. The negative electrode is in contact with a solution of $10^{-6}M$ hydrogen ion. The EMF of

the cell is 0.118 V at 298 K. The concentration of H^+ ion at the positive electrode is 10^{-x}, The value of 'x' is

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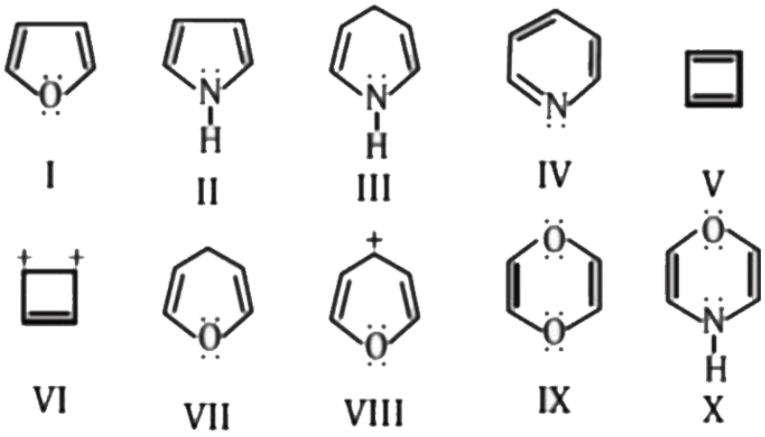
22. The number of compounds in which complete delocalisation of π- electron can takes place is.



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23. Among the following metals how many metals are extracted by self-reduction method from their respective ores. (Give total number).Hg , Zn, Cu, Al, Mg , Pb, Fe, Sn

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24. In the esterification

$C_2H_5OH(l) + CH_3COOH(l) \text{ an } \Leftrightarrow CH_3COOC_2H_5(l) + H_2O(l)$

equimolar mixture of alcohol and acid taken initially yields under equilibrium, the water with mole fraction $= 0.333$. The equilibrium constant. Is

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25. The number of unbranched isomers (including stereoisomers) of C_6H_{12} are

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