CHEMISTRY

BOOKS - NTA MOCK TESTS

JEE MOCK TEST 21

Chemistry

1. When $10ml$ of $0.1M$ acetic acid $(pK_a = 5.0)$ is titrated against $10ml$ of $0.1M$ ammonia solution $(pK_b = 5.0)$, the equivalence point occurs at pH

A. 5

B. 6

C. 7

D. 9

Answer: C

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2. Choose the incorrect statements.

A. $BeCO_3$ is preserved in an atmosphere of CO_2 as it is thermaly least stable.

B. BeF_2 forms a complex compound with excess NaF, in which the complex entity containing Be, is a cation.

C. Beryllium dissolves in an alkali to form $\left[Be(OH)_4\right]^{2-}$ ion.

D. Beryllium exhibits no diagonal relationship with sodium.

Answer: B

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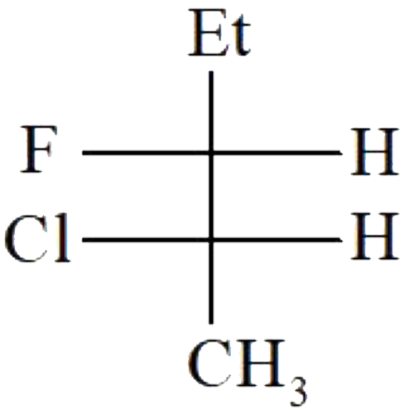
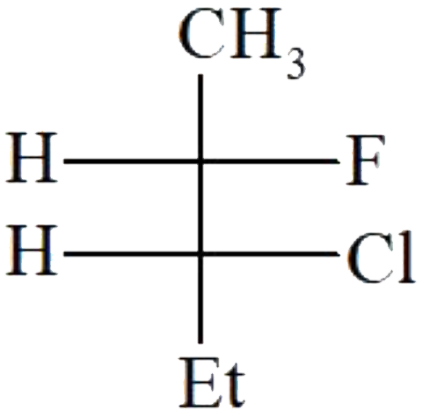
3.



has optical rotation -45°, so optical rotation of



will be

A. $+45^\circ$

B. 0°

C. -45°

D. can not be predicted

Answer: D

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4. HF is not stored in glass bottles because

A. It reacts with the aluminium oxide of the glass

B. it reacts with SiO_2 of the glass

C. It reacts with the visible part of the light

D. It reacts with sodium oxide of the glass

Answer: B

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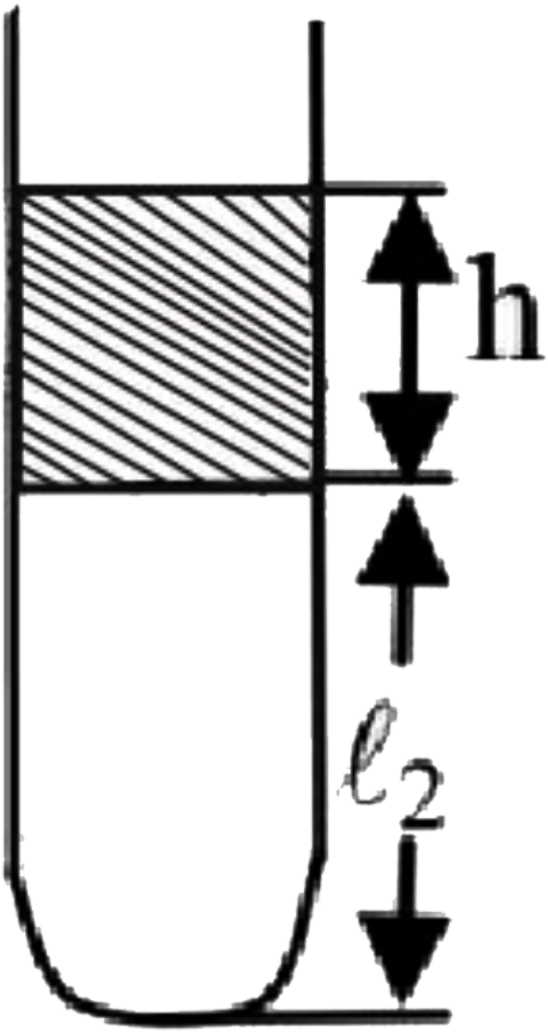
5. An air column closed in a tube sealed at one end by a Hg column having height h. When the tube is placed with open end down, the height of the air column Iis l_1. If the tube is turned so that its open end is at the

top, the height of the air column is l_2. What is the atmospheric pressure (P_0).



A. $P_0 = \dfrac{h(l_1 + l_2)}{(l_2 - l_1)} cm$ of Hg

B. $P_0 = \frac{h(l_1 - l_2)}{(l_2 + l_1)} cm$ of Hg

C. 76 cm of Hg

D. $P_0 = \frac{h(l_2 + l_1)}{(l_2 - l_1)} cm$ of Hg

Answer: D

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6. 2-Methylbutan-2-ol can be obtained by the acid catalyzed hydration of

A. $CH_3CH_2CH = CH_2$

B. $CH_3CH = CHCH_3$

C. $(CH_3)_2C = CHCH_3$

D. Either of the three

Answer: C

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7. The pyrimidine bases present in DNA are

A. Cytosin and Uracil

B. Cytosine and Thymine

C. Cytosin and Guanine

D. Cytosine and Adenine

Answer: B

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8. Which of the following is not isostructural with $SiCl_4$?

A. SO_4^{2-}

B. PO_4^{3-}

C. NH_4^+

D. SCl_4

Answer: D

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9. For the reaction, $2A + B \rightarrow C + D$, the order of reaction is

A. One with respect [B]

B. Two with respect to [A]

C. Three

D. Cannot be predicted

Answer: D

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10. In the reaction

$CH_3COOH \xrightarrow{LiAlH_4} (A) \xrightarrow{I_2 + NaOH} (B) \xrightarrow{Ag\,(\text{Dust})} (C)$, the final product C is:-

A. C_2H_5I

B. C_2H_5OH

C. C_2H_2

D. CH_3COCH_3

Answer: C

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11. Equilibrium constant K_p for the reaction $CaCO_3(s) \Leftrightarrow CaO(s) + CO_2(g)$ is 0.82 atm at $727^\circ C$.

If 1 mole of $CaCO_3$ is placed in a closed container of 20 L and heated to this temperature, what amount of $CaCO_3$ would dissociate at equilibrium?

A. 0.2 g

B. 80 g

C. 20 g

D. 50 g

Answer: C

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12. $TiAl(SO_4)_2.xH_2O$ is bcc with 'a' =1.22 nm. If the density of the solid is $2.32g/cc$, then the value of x is (Given :$N_A = 6 \times 10^{23}$) , at . Mass : $Ti = 204, Al = 27, S = 32$).

A. 2

B. 4

C. 47

D. 70

Answer: C

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13. In compound $O_2SC(NH_2)_2$, the geometry around S and N are respectively.

A. trigonal planar, trigonal pyramidal

B. tetrahedral,pyramidal

C. trigonal planar, tetrahedral

D. linear, pyramidal

Answer: A

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14. Geometrical shapes of the complex formed by the reaction of Ni^{2+} with Cl^{Θ}, CN^{Θ} and H_2O are :

A. Octahedral, tetrahedral and square planar

B. Tetrahedral , square planer and octahedral

C. Square planer, tetrahedral and octahedral

D. Octahedral, square planer and octahedral

Answer: B

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15. Slope of V_0 vs v curve is (where V_0= Stopping potential, v=subjected freqency)

A. e

B. $\frac{h}{e}$

C. ϕ

D. h

Answer: B

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16. The value of $\log_{10} K$ for a reaction $A \Leftrightarrow B$ is (Given: $\Delta_f H^{\Theta}_{298K} = -54.07 kJ mol^{-1}$, $\Delta_r S^{\Theta}_{298K} = 10 JK^{-1} mol^{-1}$, and $R = 8.314 JK^{-1} mol^{-1}$

A. 5

B. 10

C. 95

D. 100

Answer: B

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17. Aldehyde with NH_2NH_2 forms

A. Hydrazone

B. Aniline

C. Nitrobenzene

D. none of these

Answer: A

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18. Gallium arsenide is purified by _____.

A. van-Arkel method

B. Zone-refining method

C. Electrolytic method

D. Liquation

Answer: B

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19. In the nucleophilic substitution reactions (S_N2 or S_N1) , the reactivity of alkyl halids follows the sequence

A. $R-I>R-Br>R-Cl>R-F$

B. $R-Cl>R-F>R-Br>R-I$

C. $R-F>R-Cl>R-Br>R-I$

D. $R-I>R-F>R-Cl>R-Br$

Answer: A

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20. At a constant temperature, which of the following aqueous solutions will have the maximum vapour pressure?

$\left(MolwtNaCl=58.5, H_2SO_4=98.0gmol^{-1}\right)$

A. 1 molal $NaCl$(aq)

B. 1 molar $NaCl$ (aq)

C. 1 molal H_2SO_4 (aq)

D. 1 molar H_2SO_4 (aq)

Answer: A

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21. First and second ionization energies of magnesium are 7.646 and 15.035 eV respectively. The amount of energy in kJ/mol needed to convert all the atoms of Magnesium into Mg^{2+} ions present in 12 mg of magnesium vapours is: (Report your answer by multiplying with 10 and round it upto nearest integer)

(Given $1eV = 96.5kJmol^{-1}$)

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22. Molar conductivity of aqueous solution of HA is $200Scm^2mol^{-1}$, pH of this solution is 4

Calculate the value of $pK_a(HA)$ at $25^\circ C$.

Given $\wedge_M^\infty (NaA) = 100 Scm^2 mol^{-1}$,

$\wedge_M^\infty (HCl) = 425 Scm^2 mol^{-1}$,

$\wedge_M^\infty (NaCl) = 125 Scm^2 mol^{-1}$

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23. How many of the following ethers CANNOT be prepared by Williamson's synthesis?

$CH_3OCH_2CH_3, C_6H_5OCH_3, (C_6H_5)_2O, (CH_3)_3COCH_3, (C_2H_5)_2O, (CH$

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24. How many of the following groups if substituted at o- and /or p- postions of chlorobenzene, increase its reactivity towards nucleophilic substitution?

$-CN, -CH_3, -NH(CH_3), -COOH, -NO_2, -OCH_3.$

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25. How many of the following are lanthanides?

Uranium, praseodymium, erbium, gadolinium, cerium, hafnium, osmium, iridium

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