CHEMISTRY

BOOKS - NTA MOCK TESTS

NTA JEE MOCK TEST 55

Chemistry

1. The pH of blood stream is maintained by a proper balance of H_2CO_3 and $NaHCO_3$ concentrations. What volume of 5 M $NaHCO_3$ solution, shnould be mixed with 10 mL sample of blood, which is 2 M in H_2CO_3 in order to maintain a pH of $7.4(K_af$ or H_2CO_3in blood $=7.8 \times 10^{-7})$

A. 40 mL

B. 38 mL

C. 50 mL

D. 79 mL

Answer: D

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2. When $2.76g$ of silver carbonate is strongly heated, it yields a residue weighing

A. 2.16 g

B. 2.48 g

C. 2.32 g

D. 2.64 g

Answer: A

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3. Concentrated hydrochloric acid when kept in open air sometimes produces a cloud of white fumes. The explanation for it is that :

A. oxygen in air reacts with the emitted HCl gas to form a cloud of chlorine gas

B. strong affinity of HCl gas for moisture in air results in forming of droplets of liquid solution which appears like a cloudy smoke

C. due to storng affinity for water, concentrated hydrochloric acid pulls moisture of air towards itself. This moisture forms droplets of water and hence the cloud

D. cocentrated hydrochloric acid emits strongly smelling HCl gas all the time

Answer: A

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4. The combustion of benzene (l) gives $CO_2(g)$ and $H_2O(l)$. Given that heat of combustion of benzene at constant volume is $-3263.9kJmol^{-1}$ at $25^\circ C$, heat of combustion (in kJmol^{-1}) of benzene at constant pressure will be

(R = 8.314 JK–1 mol–1)

A. -3267.6

B. 4152.6

C. -452.46

D. 3260

Answer: A

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5. The energy required to break one mole of $Cl - Cl$ bonds in Cl_2 is $242kJmol^{-1}$. The longest wavelength of light capable of breaking a since $Cl - Cl$ bond is

A. 594 nm

B. 640 nm

C. 700 nm

D. 494 nm

Answer: D

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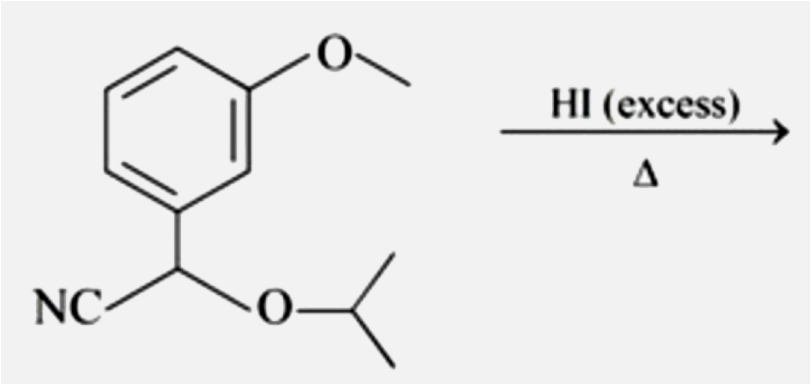
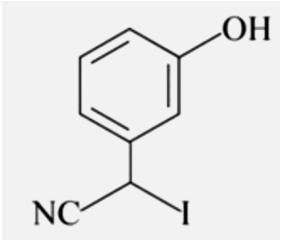
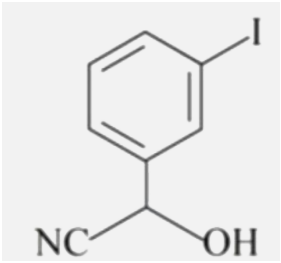
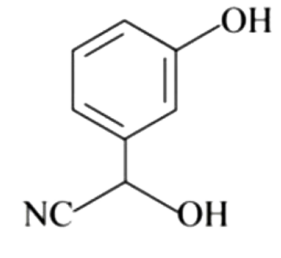
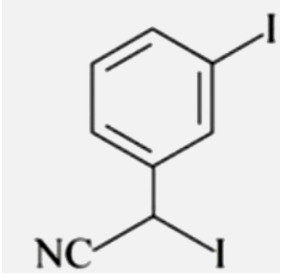
6. The major product of the following reaction is :



A. 

B. 

C. 

D. 

Answer: A

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7. Why is $SiCl_4$ readily hydrolysed but CCl_4 is resistant to hydrolysis?

A. $Si - Cl$ bond is weaker than $C - Cl$ bond

B. $SiCl_4$ can form hydrogen bonds

C. $SiCl_4$ is covalent

D. Si can extent its coordination number beyound four

Answer: D

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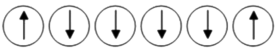
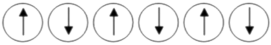
8. Which of the following arrangements shows the schematic alignment of magnetic moments of anti - ferromagnetic substance?

A. 

B. 

C. 

D. 

Answer: D

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9. The order of stability of the following tautomeric compound is

$$\underset{(I)}{CH_2 = C(OH) - CH_2 - CO - CH_3}$$

$\rightarrow CH_3 - \underset{(II)}{CO} - CH_2 - CO - CH_3$

$\rightarrow CH_3 - \underset{(III)}{C(OH)} = CH - CO - CH_3$

A. $III > II > I$

B. $II > I > III$

C. $II > I > III$

D. $I > II > III$

Answer: A

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10. The following reactions show the H_2O_2 behaviour in A and B reactions as

(1) $PbS_{(s)} + 4H_2O_{2(aq)} \rightarrow PbSO_{4(s)} + 4H_2O_{(l)}$

(2) $HOCl + H_2O_2 \rightarrow H_3O^+ + Cl^- + O_2$

A. oxidising in acidic medium and reducing in basic medium

B. reducing in acidic medium and oxidising in basic medium

C. oxidising in acidic medium and reducing in acidic medium

D. reducing in acidic medium and oxidising in acidic medium

Answer: C

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11. The effective nuclear charge of an element with three valence electrons is 2.60. What is the minimum atomic number of the element?

A. 5

B. 4

C. 3

D. 2

Answer: A

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12. $[P] \xrightarrow{Br_2} C_2H_4Br_2 \xrightarrow{NaNH_2} Q \xrightarrow{20\%\, H_2SO_4} R \xrightarrow{Zn Hg / HCl} S$

The species P, Q, R and S respectively are

A. ethene, ethyne, ethanal, ethane

B. ethane, ethyne, ethanal, ethene

C. ethene, ethyne, ethanal, ethanol

D. ethyne, ethane, ethene, ethanal

Answer: A

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13. What will be the expression of K_p for the given reaction if the total pressure inside the vessel is P and degree of dissociation of the reactant is a? The reaction

$N_2O_4 \Leftrightarrow 2NO_2$

A. $\frac{4a^2P}{1+a^2}$

B. $\frac{4a^2P}{1-a^2}$

C. $\frac{a^2P}{1-a^2}$

D. $\frac{a^2}{1-a^2}$

Answer: B

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14. Mole fraction of component A in vapour phase is χ_1 and that of component A in liquid mixture is χ_2, then (p_A°)= vapour pressure of

pure A, p_B° = vapour pressure of pure B), the total vapour pressure of liquid mixture is

A. $\frac{P_A^\circ x_1}{x_2}$

B. $\frac{P_A^\circ x_2}{x_1}$

C. $\frac{P_B^\circ x_1}{x_2}$

D. $\frac{P_B^\circ x_2}{x_1}$

Answer: B

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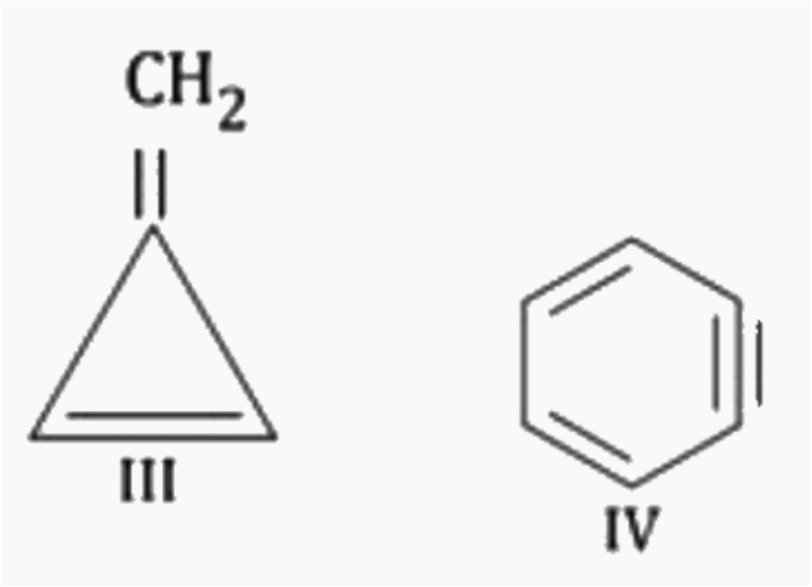
15. Which of the following structure contains sp - hybridized carbon atoms?

$\underset{I}{HC \equiv CH}$ $\underset{II}{H_2C = C = CH_2}$



A. I, II and IV

B. I, III and IV

C. II, III and IV

D. I and II

Answer: D

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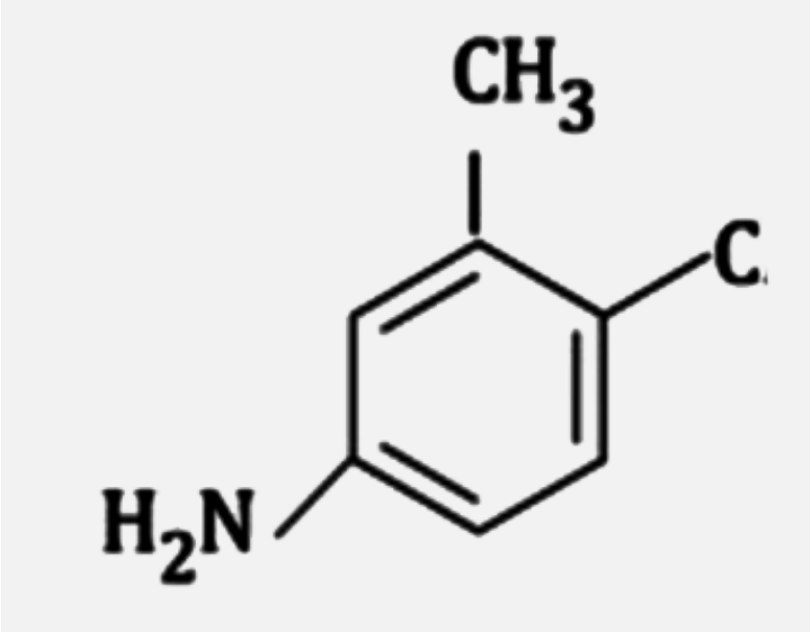
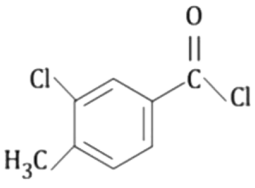
16. Identify 'M' in the following sequence of reactions

$$\underset{(M)}{C_8H_6Cl_2O} \xrightarrow{NH_3} C_8H_8ClNO \xrightarrow[NaOH]{Br_2}$$



A.



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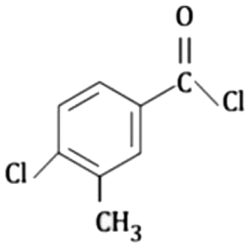
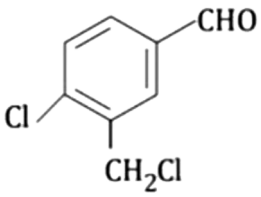
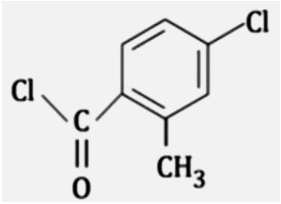


C. 

D. 

Answer: B

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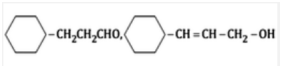
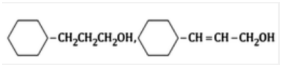
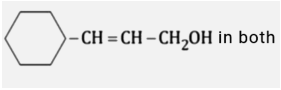
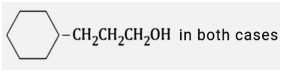
17. What are 'X' and 'Y' respectively?

A. 

B. 

C. 

D. 

Answer: B

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18. The voltage of the cell consisting of $Li_{(s)}$ and $F_{2(g)}$ electrodes is 5.92 V at standard condition at 298 K. What is the voltage if the electrolyte consists of 2 M LiF.

$\left(\ln 2 = = 0.693, \mathrm{R} = 8.314 \text{ J K}^{-1} \text{ mol}^{-1} \text{ and } F = 96500 \text{ C mol}^{-1}\right)$

A. 5.90 V

B. 5.937 V

C. 5. 88 V

D. 4. 9 V

Answer: C

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19. When $AgNO_3$ solution is added in excess to 1 M solution of $CoCl_3.XNH_3$ one mole of $AgCl$ is formed? What is the value of 'X' ? (Assume that the co - ordination number is 6)

A. 1

B. 4

C. 3

D. 2

Answer: B

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20. What will be the nature of existence of an amino acid (containing one amino and one carboxylic acid group) in solution of $pH < pK_{a_1}$?

A. It exists an anion

B. It exists as cation

C. It exists as zwitter ion

D. It exists as neutral species with no charge

Answer: B

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21. At $400K$, the root mean square (rms) speed of a gas X (molecular weight = 40) is equal to the most probable speed of gas Y at 60 K. The molecular weight of the gas Y is.

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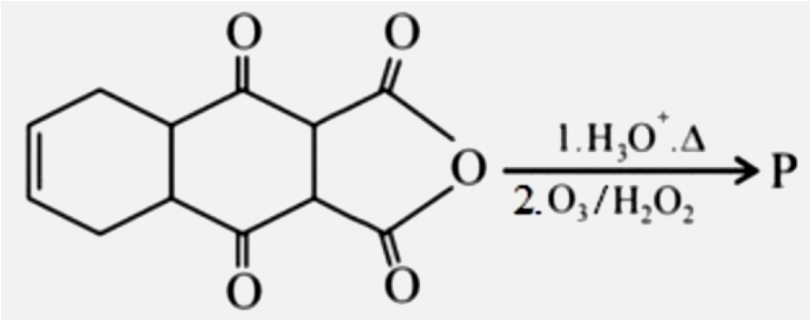
22. The total number of carboxylic acid groups in the product P is



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23. If the formula of basic Beryllium nitrate is $\left[Be_nO(NO_3)_6\right]$. What is the value of 'n' here

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24. How many of these metals can show $+3$ oxidation state also.

$Sc, Ti, V, Cr, Mn, Fe, Co, Ni, Zn$

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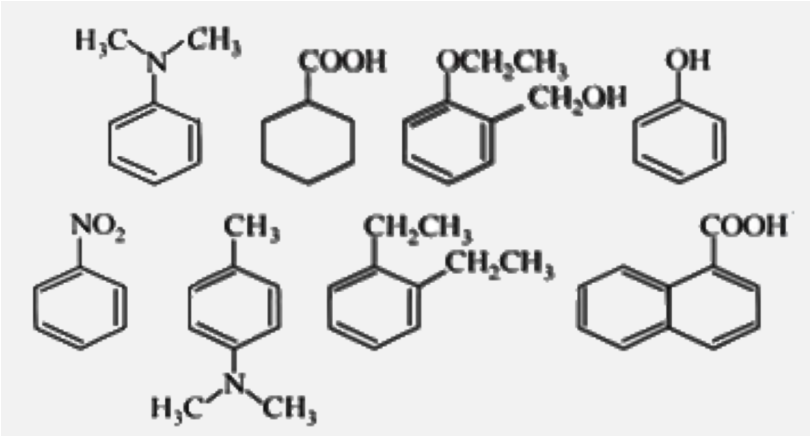
25. Amongst the following, the total number of compounds soluble in aqueous $NaOH$ is



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