CHEMISTRY

BOOKS - NTA MOCK TESTS

NTA JEE MOCK TEST 43

Chemistry

1. CsBr has bcc like structures with edge length 4.3Å . The shortest inter ionic distance in between Cs^+ and Br^- is:

A. $4.3Å$

B. $7.44Å$

C. $1.86Å$

D. $3.72Å$

Answer: D

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2. Predict the order of $\Delta_{\circ}$ for the following compounds

I $\left[Mn(H_2O)_6\right]^{2+}$

II $\left[Mn(CN)_2(H_2O)_4\right]$

III $\left[Mn(CN)_4(H_2O)_2\right]^{2-}$

A. $\Delta_\circ(I) < \Delta_\circ(II) < \Delta_\circ(III)$

B. $\Delta_\circ(II) < \Delta_\circ(I) < \Delta_\circ)(III)$

C. $\Delta_\circ(III) < \Delta_\circ(II) < \Delta_\circ(I)$

D. $\Delta_\circ(I) < \Delta_\circ(III) < \Delta_\circ(II)$

Answer: A

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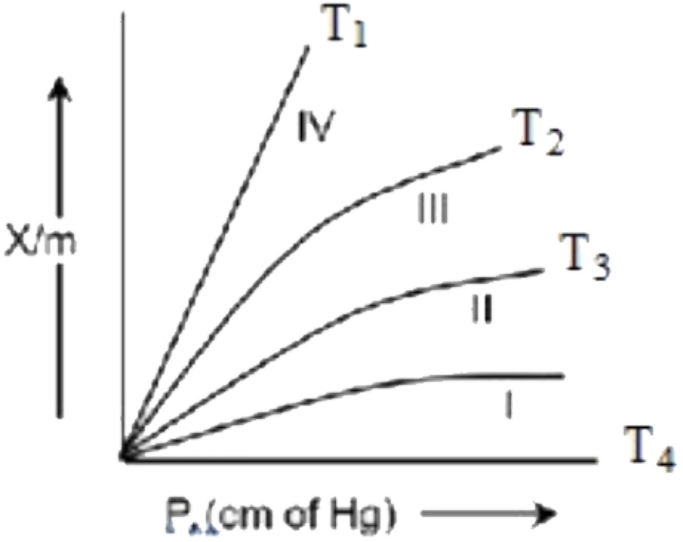
3. The plots of the extent of adsroption (x/m) Vs pressure at different temperature are as follows,



The correct order of increasing temp for curves I, II, III, IV are ,

A. $T_1 > T_2 > T_3 > T_4$

B. $T_4 > T_3 > T_2 > T_1$

C. $T_3 > T_2 > T_1 > T_4$

D. can't be predicted

Answer: B

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4. Which of the following are not more basic than $Al(OH)_3$?

A. $Ca(OH_2, Ce(OH)_3$

B. $Yb(OH)_3, Lu(OH)_3$

C. $B(OH)_3, Be(OH)_2$

D. $Ce(OH), Lu(OH)_3$

Answer: C

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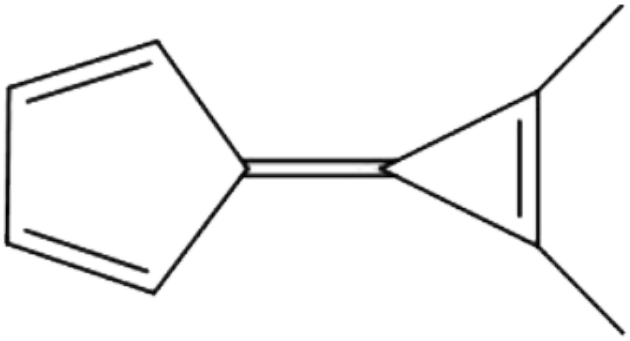
5. Ordinarily the barrier to rotation about a carbon - carbon double bond is quite high but in compound P double bond between two rings was observed by NMR to have a rotational energy barrier of only about 20 cal/mol., showing that it has lot of single bond character.



The reason for this is

A. Double bond having partial triple bond character because of resonance

B. Double bond undergoes flipping

C. Double bond having very high single bond character because of aromaticity gained in both three and five membered rings.

D. $+I$ effect of nC_3H_7 groups makes double bond having partial single bond character.

Answer: C

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6. In the reaction, $4NH_3(g) + 5O_2(g) \rightarrow 4NO(g) + 6H_2O(g)$, when 1 mole of ammonia and 1 mole of O_2 are made to react to completion

A. 0.2 mol of H_2O is produced

B. 0.1 mol of

C. all the oxygen will be consumed

D. all the ammonia will be consumed in order to form 1 mole NO

Answer: C

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7. The equilibrium $SO_2Cl_2(g) \Leftrightarrow SO_2(g) + Cl_2(g)$ is attained at $25^\circ C$ in a closed container and an inert gas, helium, is introduced. Which of the following statement is / are correct?

A. More chlorine is formed

B. Concentration of SO_2 is reduced

C. More SO_2Cl_2 is formed

D. Concentration of SO_2, Cl_2, SO_2 and Cl_2 do not change

Answer: D

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8. Wooden artifact and freshly cut tree give 7.7 and $15.4\,\text{min}^{-1}g^{-1}$ of carbon $\left(t_{\frac{1}{2}} = 5770\,\text{years}\right)$ respectively. The age of the artifact is

A. 5770 years

B. $5770 \times \frac{15.4}{7.7}$ years

C. $5770 \times \frac{7.7}{15.4}$ years

D. None of these

Answer: A

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9. Which of the following is an example of heterogeneous catalysis ?

A.

$$n(CH_2 = CH_2) \xrightarrow{R_3Al + TiCl_4} [-CH_2 - CH_2 -]_4$$

B. $2SO_2 + O_2 \xrightarrow{\text{Pt - Asbestos}} 2SO_3$

C. $RCOOR \xrightarrow[\text{Catalyst}]{H^+} RCOOH + ROH$

D. $2H_2O_2(l) \xrightarrow{Hg(l)} 2H_2O + O_2$

Answer: C

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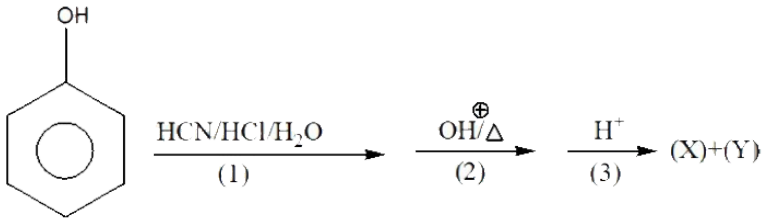
10. 

X gives white turbidity with Lucas reagent instantly.

X and Y both turn blue litmus solution red. Y can be:

A. p- Hydroxy benzoic acid

B. p - Hydroxy benzaldehyde

C. m - Hydroxy benzoic acid

D. p - Hydroxy benzyl alcohol

Answer: A

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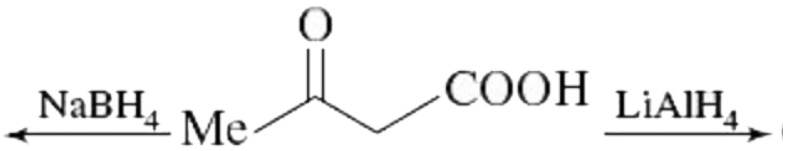
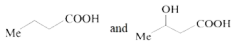
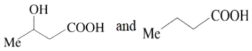
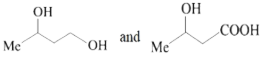


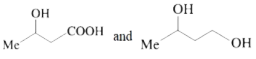
11.

A and B respectively are

A. 

B. 

C. 

D. 

Answer: C

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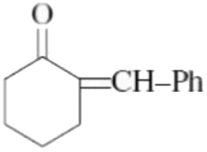
12. $C_3H_6O(A) \xrightarrow[OH^- / \Delta]{PhCHO} B$

$\downarrow$

Gives positive Tollen's test

Product B is :

A. $Ph - CH = \underset{\underset{CH_3}{|}}{C} - CH_3$

B. 

C. $Ph - \overset{\overset{CH_3}{|}}{C} = CH - Ph$

D. $Ph - CH = \underset{\underset{CH_3}{|}}{C} - CHO$

Answer: D

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13. 1 - Methylcyclohexene on addition of HCl produces

A. 1 - chloro -1- methylcyclohexane

B. (±)-trans -2- chloro -1- methylcyclohexane

C. (±) cis -2- chloro -1- methylcyclohexane

D. 1 - chloro -2- methylcyclohexane

Answer: A

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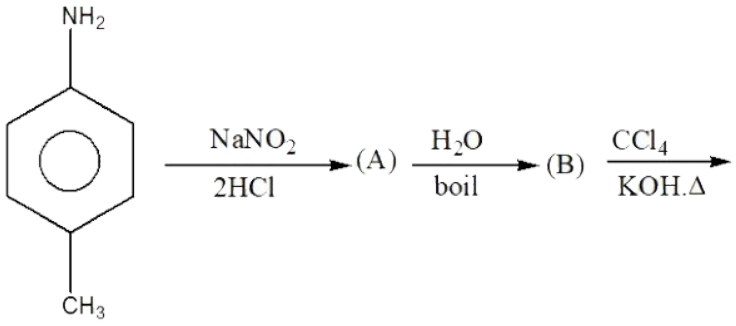
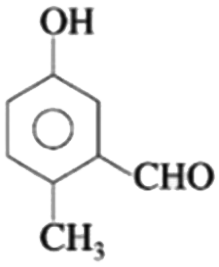
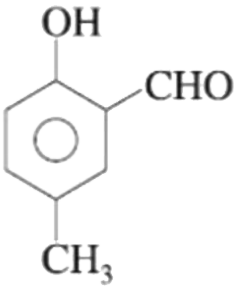
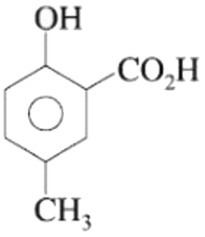
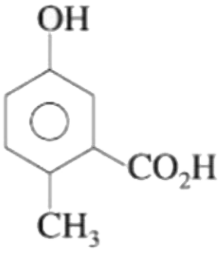
14. 

Major product C is :

A. 

B. 

C. 

D. 

Answer: C

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15. Which of the following orders is correct?

(1)

$SbH_3 > NH_3 > AsH_3 > PH_3 -$ Boiling Point

(2)

$NH_3 > PH_3 > AsH_3 > SbH_3 -$ Thermal Stability

(3)

$NH_3 > PH_3 > AsH_3 > SbH_3 -$ Basic Character

(4) $NH_3 > PH_3 > AsH_3 > SbH_3 -$ Bond Angle

A. (1), (2) and (3) only

B. (2), (3) and (4) only

C. (1), (3) and (4) only

D. (1), (2), (3) and (4).

Answer: C

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16. Select the correct statement :

A. PH_3 is reduces $AgNO_3$ to metallic Ag.

B. Organic tissues turn $AgNO_3$ black by reducing it to Ag.

C. $AgCN$ is soluble in KCN.

D. All are correct statements.

Answer: D

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17. Which of the following statements is incorrect?

A. In Half - Heroult process, the electrolyte used is a molten mixture of alumina, sodium hydroxide and cryolite.

B. Lead is extracted form its chief ore by both carbon reduction and self reduction..

C. Tin is extracted from its chief ore by carbon monoxide reduction.

D. Siderite and cassiterite are carbonate ores.

Answer: D

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18. According to the molecular orbital theory which of the following statement is incorrect?

[LUMO = lowest unoccupied molecular orbital]

A. LUMO level for C_2 molecule is $\sigma 2p_x$ orbital.

B. In C_2 molecules both the bonds π are bonds

C. In C_2^{2-} ion there is one σ and two π bonds

D. C_2 is paramagnetic but C_2^{2-} is diamagnetic.

Answer: D

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19. Gradual addition of KI solution of $Bi(NO_3)_3$ solution intially produces a dark brown precipitate which dissolves in excess of KI to give a clear yellow solution. Write chemical eqautions for the above reactions.

A. I_2

B. KI_3

C. $Bi(OH)_2$

D. $Bi(OH)(NO_3)_2$

Answer: B

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20. The characteristics X-rays wavelength is related to atomic number by the relation $\sqrt{\nu} = a(Z - b)$ When Z is the atomic number, a and b are Mosley's constants. If $\lambda_1 = 2.886\text{Å}$ and $\lambda_2 = 2.365\text{Å}$ corresponding to $Z_1 = 55$ and $Z_2 = 60$ respectively, the value of Z corresponding to $\lambda = 2.660\text{Å}$ is

A. 63

B. 67

C. 74

D. 507

Answer: D

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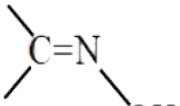
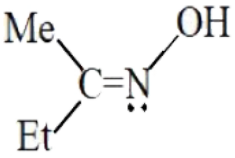
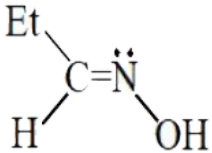
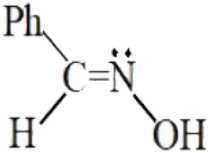
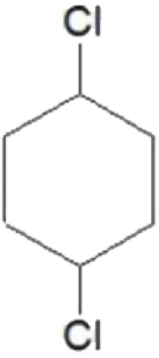
21. How many of the following can show geometrical isomerism

I. 

II. 

III. 

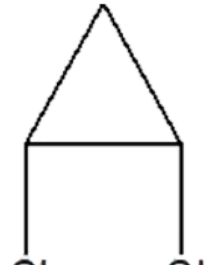
IV. 

V. 

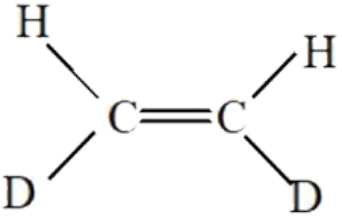
VI. $CHCl = C = CHCl$

VII. $pH - N = N - Ph$

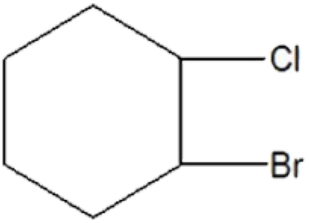
VIII. $MeCH = N - NH_2$

IX. 

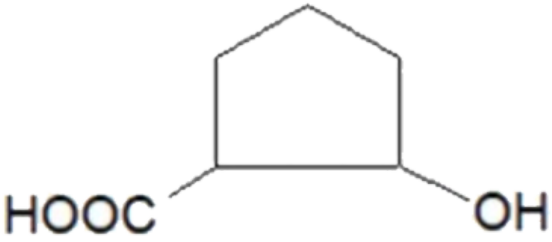
X. $CHCl = C = C = CHCl$

XI. 

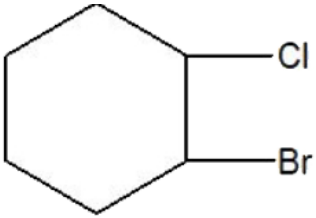
XII. $CH_3 - C \equiv C - CH_2Cl$

XIII. 

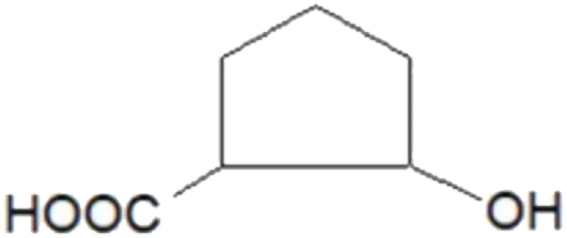
XIV.

XV. 

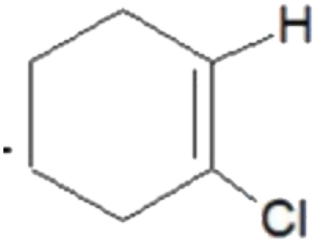
XIII.

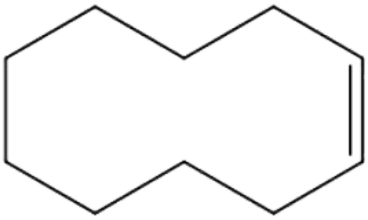


XIV.



XV.





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22. For the strong electrolytes $NaOH, NaCl$ and $BaCl_2$ the molar ionic conductivities at infinite dilution are 250, 125 and 300 $\text{mho cm}^2\text{mol}^{-1}$ respectively. The molar conductivity of $Ba(OH)_2$ at infinite dilution $\left(\text{mho cm}^2\text{mol}^{-1}\right)$ is .

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23. Two moles of a gas at 8.21 bar and 300 K are expanded at constant temperature up to 2.73 bar against a constant pressure of 1 bar. How much

work (in Latm) is done by the gas?

(neglect the sign)

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24. 30 ml of 0.2 M NaOH is added with 50 ml $0.2\,\mathrm{M}$ CH_3COOH solution. The extra volume of 0.2 M NaOH required to make the pH of the solution 5.00 is $\frac{10}{x}$. The value of x is. The ionisation constant of $CH_3COOH = 2 \times 10^{-5}$.

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25. The combustion of solidum is excess air yeilds a higher oxide. What is the oxidation state of the oxygen in the product? Neglect the negative sign.