CHEMISTRY

BOOKS - NTA MOCK TESTS

NTA JEE MOCK TEST 93

Chemistry

1. Find the maximum value $(n + l + m)$ for unpaired electrons in second excited state of chlorine $._{17} Cl$.

A. 4

B. 20

C. 28

D. 27

Answer: A

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2. SbF_5 reacts with XeF_4 to form an adduct. The shapes of cation and anion in the adduct are respectively :

A. square planar, trigonal bipyramidal

B. T - shaped, octahedral

C. Square pyramidal, octahedral

D. Square planar, octahedral

Answer: B

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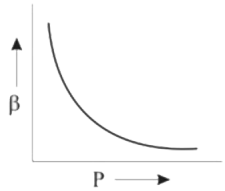
3. Which of the following graphs correctly represents the variation of $\beta = -\frac{dV/dP}{V}$

with P for an ideal gas at constant temperature?

A.



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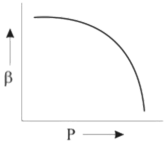

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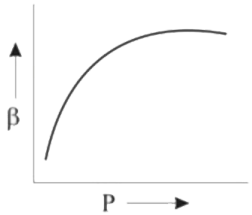
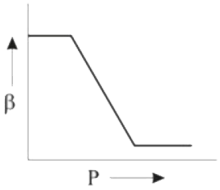


D.



Answer: A

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4. Which one of the following statements regarding the population of different conformers butane -2, 3 - diol is true?

A. The most populated conformer with have the hydroxyl groups of the gauche position.

B. The most populated conformer will have the hydroxyl groups at the anti position.

C. All staggered conformations will be equally populated.

D. Relative populations of different conformers is not predictable

Answer: A

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5. Band theory predicts that magnesiums is an insulator. However, in practice it acts as a conductor due to

A. presence of filled 3s - orbital

B. overlap of filled 2p and filled 3s - orbital

C. overlap of filled 3s and empty 3p - orbital

D. presence of unfilled 3p - orbital

Answer: C

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6. Consider the given compounds :

(a) $CH_3 - CH_2 - NH_2$ (b) $CH_3 - CH = NH$

(c) $CH_3 - C = N$ (d) $C_2H_5 - NH - C_2H_5$

Arrange basicity of these compounds in decreasing order :

A. $4 > 1 > 2 > 3$

B. $1 > 2 > 3 > 4$

C. $1 > 4 > 2 > 3$

D. $4 > 1 > 3 > 2$

Answer: A

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7. Which of the following ionic/molecular species does not disproportionate in water at room temperature?

A. NO_2

B. Cu^+

C. MnO_4^{2-}

D. $Ca(OCl)Cl$

Answer: D

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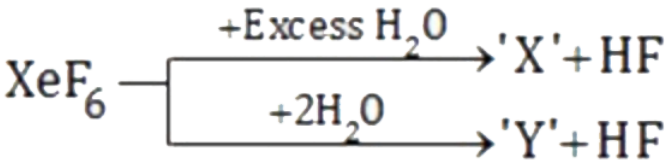
8. In correct statement regarding following reaction is



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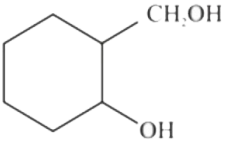
9. In the given reaction

 [X] will be

A.



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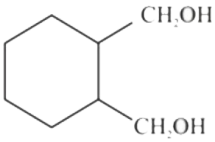

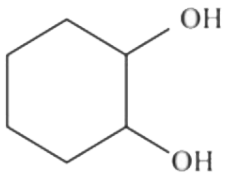

C.

D.

Answer: A

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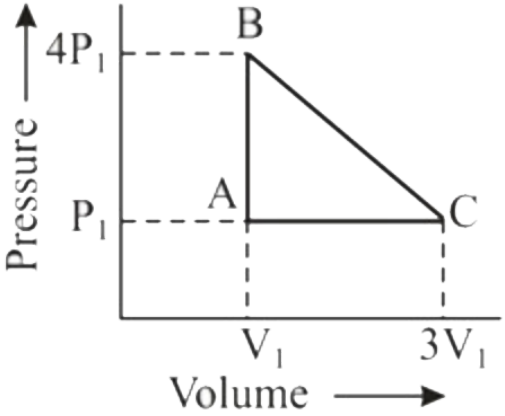
10. An ideal gas is taken around the cycle ABCA as



A. $12P_1V_1$

B. $6P_1V_1$

C. $3P_1V_1$

D. P_1V_1

Answer: C

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11. $CuSO_4(aq) \xrightarrow{H_2S\uparrow} M \downarrow \xrightarrow{\text{Excess of KCN}} N + O$

Then final product N and O are respectively.

A. $\left[Cu(CN)_4\right]^{3-}, (CN)_2$

B. $CuCN, (CN)_2$

C. $\left[Cu(CN)_4\right]^{2-}, (CN)_2$

D. $Cu(CN)_2, K_2S$

Answer: A

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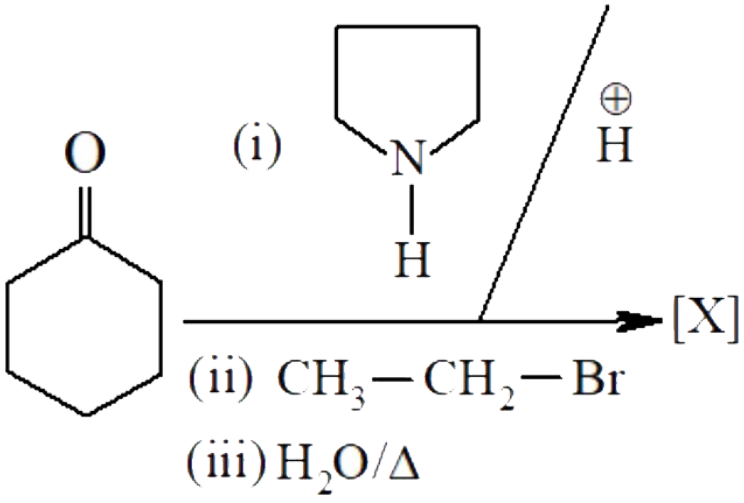
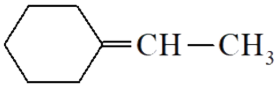
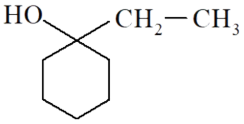
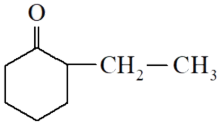
12. In the reaction sequence

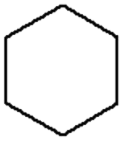


will be

A. 

B. 

C. 

D. 

Answer: C

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13. Equilibrium constant K_C for the following reaction at 800 K is, 4

$NH_3(g) \Leftrightarrow \frac{1}{2}N_2(g) + \frac{3}{2}H_2(g).$

The value of K_p for the following reaction will be

$N_2(g) + 3H_2(g) \Leftrightarrow 2NH_3(g)$

A. $\left(\frac{800R}{4}\right)^{2-}$

B. $16 \times (800R)^2$

C. $\left[\frac{1}{4 \times 800R}\right]^2$

D. $(800R)^{1/2}4$

Answer: C

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14. Arrange the following cyano complexes in decreasing order of their magnetic moment.

A.

$$[Cr(CN)_6]^{3-} > [Mn(CN)_6]^{3-} > [Fe(CN)_6]^{3-} > [Co(CN)_6]^{3-}$$

B.

$$[Mn(CN)_6]^{3-} > [Cr(CN)_6]^{3-} > [Fe(CN)_6]^{3-} > [Co(CN)_6]^{3-}$$

C.

$$[Fe(CN)_6]^{3-} > [Cr(CN)_6]^{3-} > [Mn(CN)_6]^{3-} > [Co(CN)_6]^{3-}$$

D.

$$[Co(CN)_6]^{3-} > [Cr(CN)_6]^{3-} > \left[Mn(CN)_6^{3-} > [Fe(CN)_6]^{3-}\right.$$

Answer: A

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15. A reactant (A) forms two products

$A \xrightarrow{k_1} B$, Activation energy E_{a1}

$A \xrightarrow{k_2} C$, Activation energy E_{a2}

If $E_{a_2} = 2E_{a_1}$ then k_1 and k_2 are related as

A. $k_2 = k_1 e^{\frac{-Ea_1}{RT}}$

B. $k_2 = k_1 e^{\frac{Ea_2}{RT}}$

C. $k_1 = Ak_2 e^{\frac{Ea_2}{RT}}$

D. $k_1 = 2k_2 e^{\frac{Ea_2}{RT}}$

Answer: A

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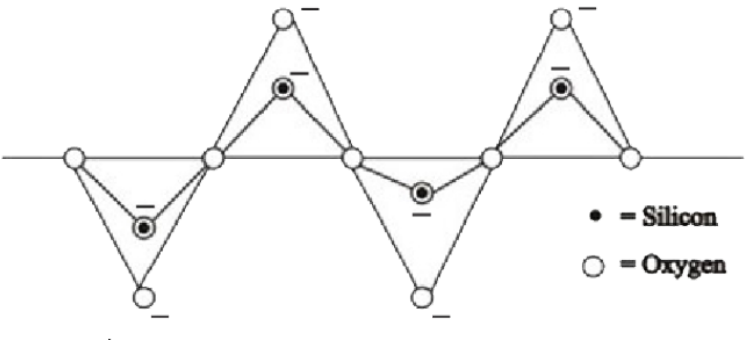
16. Pyroxenes are class of silicate minerals, which exhibit a polymeric chain structure, as shown below



Its simplest repeating unit is

A. $[SiO_4]^{4-}$

B. $[SiO_3]^{2-}$

C. $[Si_2O_7]^{6-}$

D. $[Si_4O_{11}]^{6-}$

Answer: B

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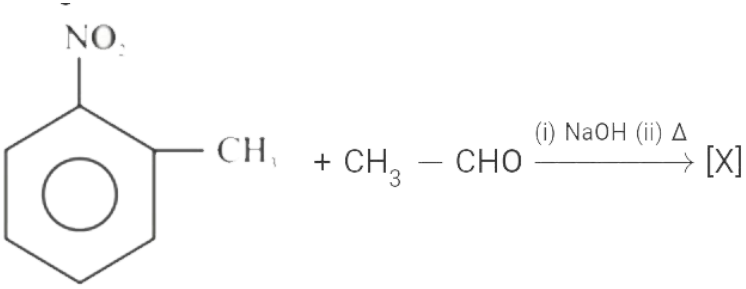
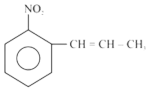
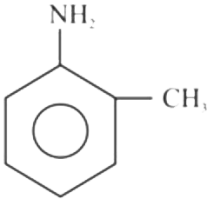
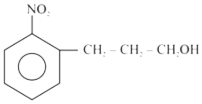
17. In the given reaction

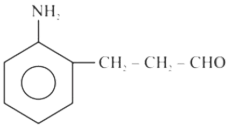


[X] will be

A. 

B. 

C. 

D. 

Answer: A

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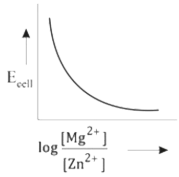
18. $Mg(s)\left|Mg^{2+}(aq)\right|\left|Zn^{2+}(aq)\right|Zn(s), E^{\circ} = +3.13V$

The correct plot of E_{cell} versus $\log.\dfrac{[Mg^{2+}]}{[Zn^{2+}]}$ will be represented as

A.



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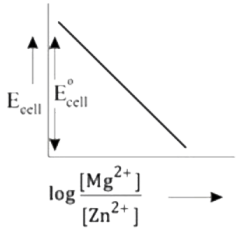
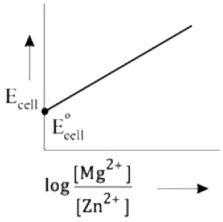
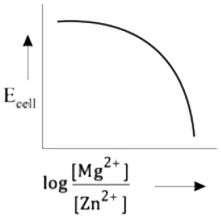


C.



D.



Answer: B

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19. In the reaction sequence

$$C_6H_5CHO \xrightarrow[\Delta]{NH_2OH/H^{\oplus}} (X) \xrightarrow{P_2O_5/\Delta} (Y) \xrightarrow{H_2 \frac{\emptyset}{H^{\oplus}}} (Z)$$

(X), (Y) and (Z) respectively be

A. $C_6H_5CH = N - OH, C_6H_5CN, C_6H_5COOH$

B. $C_6H_5CH = NOH, C_6H_5CONH_2, C_6H_5CONH_2$

C. $C_6H_5 - CH = NOH, C_6H_5COOH, C_6H_5CONH_2$

D. $C_6H_5 - CH = NOH, C_6H_5COOH, C_6H_5CN$

Answer: A

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20. Choose the correct sequence for the geometry of the given molecules

Borazon, Borazole,$B_3O_6^{3-}$, trimer of FCN.

['P' stands for planer and 'NP' standes for non-planer]

A. NP, NP, NP, P, P

B. P, P, NP, NP, P

C. NP, NP, NP, P, NP

D. NP, P, P, NP, P

Answer: D

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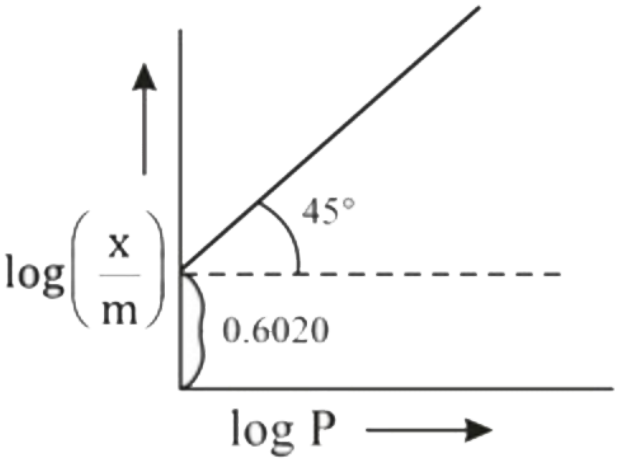
21. Graph between $\log\left(\frac{x}{m}\right)$ and $\log P$ is straight line at angle of 45° with the intercept of 0.6020.



The extent of adsorption $\left(\frac{x}{m}\right)$ at a pressure of 1 atm is

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22.

$$Na_2O_2 \xrightarrow[0°C]{\text{Water}} P + Q$$

$$Na_2O_2 \xrightarrow[25°C]{\text{Water}} P + R\uparrow + S$$

Find the sum of bond order between same bonded atoms in Q and R compounds.

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23. How many mL of 22.4 volume H_2O_2 is required to oxidise 0.1 mol of H_2S gas to S ?

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24. K_a for HCN is 5×10^{-10} at $25^\circ C$. For maintaining a constant pH of 9, the volume in ml of 5 M KCN solution required to be added to 10 ml of 2 M HCN solution is

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25. How many $-OH$ groups are present in one molecules of sucrose?

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