# CHEMISTRY

## BOOKS - NTA MOCK TESTS

## NTA JEE MOCK TEST 27

**Chemistry**

**1.** The $rms$ speed of $N_2$ molecules in a gas in $u$. If the temperature is doubled and the nitrogen molecules dissociate into nitrogen atom, the $rms$ speed becomes

A. 2u

B. 4u

C. 14u

D. $\sqrt{2}u$

**Answer: A**

**2.** For a mixture of two volatile , completely miscible liquids A and B , with $P_A^\circ = 500$ torr and $P_B^\circ = 800$ torr , what is the composition of last droplet of liquid remaining in equilibrium with vapour ? Provided the initial ideal solution has a composition of $x_A = 0.6$ and $x_B = 0.4$

A. $x_A = 0.6, x_B = 0.4$

B. $x_A = 0.5, x_B = 0.5$
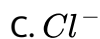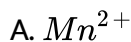
C. $x_A = 0.7, x_B = 0.3$

D. $x_A = 0.3, x_B = 0.7$

**Answer: C**

**3.** Given $E^{\circ}_{Cl_2/Cl^-} = 1.36V$, $E^{\circ}_{Cr^{3+}/Cr} = -0.74V$

$E^{\circ}_{Cr_2O_7^{2-}/Cr^{3+}} = 1.33V$, $E^{\circ}_{MnO_4^-/Mn^{2+}} = 1.51V$

Among the following, the strongest reducing agent is

A. $Mn^{2+}$

B. $Cr^{3+}$
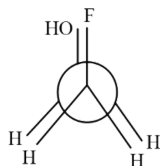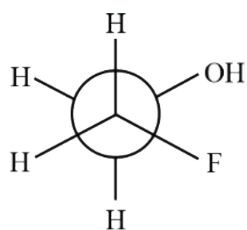
C. $Cl^-$

D. Cr

**Answer: D**

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**4.** Find the most stable form



A.

B.


C.
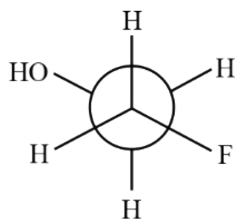
D. Both B & C

Answer: B

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5. When Na and Li placed in dry air we get:-

A. $NaOH, Na_2O, Li_2O$

B. $Na_2O, Li_2O$

C. $Na_2O, Li_2O, Li_3, NH_3$

D. $Na_2O, Li_3ON, Li_2O$

**Answer: D**

**6.** Assuming 2s - 2p mixing is NOT operative , the paramagnetic among the following is

A. $Be_2$

B. $B_2$

C. $C_2$

D. $N_2$
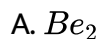
**Answer: C**

**7.** Which of the following is the correct prediction about observed B - F bond length in $BF_3$ molecule ?

A. B - F bond length in $BF_3$ is found to be less than theoretical value because the electronegativity values of B (2.04) and F (4.0) suggest the bond length to be ionic and hence , the attraction between oppositely charged ions must decrease the bond length.

B. $BF_3$ and $[BF_4]^-$ have equal B - F bond length .

C. The decrease in the B - F bond length in $BF_3$ is due to delocalised $p\pi - p\pi$ bonding between vacant 2p orbital of B and filled 2p orbital of F

D. The    correct    B    -    X    bond    length    order    is

$B - F > BCl > B - Br > B - I$

Answer: C

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**8.** In the complex $K_2Fe[Fe(CN)_6]$

A. the complex is high spin complex

B. both Fe atoms are in the same oxidation state

C. the coordination number of iron is 4

D. both Fe atoms are in different oxidation state

**Answer: B**

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**9.** Which element among the following cannot form an amphoteric oxide ?

A. Al

B. Sn

C. Sb

D. P

**Answer: D**

**10.** $2N_2O_5(g) \rightarrow 4NO_2(g) + O_2(g)$ what is the ratio of the rate of decomposition of $N_2O_5$ to rate of formation of $O_2$ ?

A. $1:2$

B. $2:1$

C. $1:4$

D. $4:1$

**Answer: B**

**11.** Why is the oxidation of a primary alcohol with mixture of sodium dichromate and sulphuric acid not a good method for the preparation of corresponding aldehyde ?

A. The product will be the corresponding ketone

B. Any aldehyde produced will be oxidised further

C. The product will be an alkyl sulphonate , $R - SO_3H$ mixture of

   sodium dichromate and sulphuric acid will not oxidize a primary

   alcohol

D. A mixture of sodium dichromate and sulphuric acid will not oxidized

   a primary alcohol

Answer: B

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12. Which reagent can convert accetic acid into ethanol?

A. Na + alcohol

B. $LiAlH_4 +$ ether

C. $H_2 + Pt$

D. $Sn + HCl$

**Answer: B**

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**13.** Sodium pheoxide reacts with $CO_2$ at $400K$ and $4 - 7$ atm pressure to give
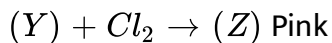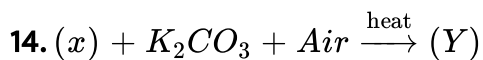
A. sodium salicylate

B. salicyladehyde

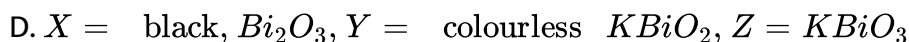C. catechol

D. benzoic acid

**Answer: A**

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**14.** $(x) + K_2CO_3 + Air \xrightarrow{\text{heat}} (Y)$

$(Y) + Cl_2 \rightarrow (Z)$ Pink

Which of the following is correct ?

A. $X = $ black, $MnO_2$, $Y = $ Blue, $K_2CrO_4$, $Z = KMnO_4$

B. $X = $ green, $Cr_2O_3$, $Y = $ Yellow, $K_2CrO_4$, $Z = K_2Cr_2O_7$

C.

$X = $ black, $MnO_2 Y = $ green, $K_2CrO_4$, $Z = K_2MnO_4$, $Z = KMnO_4$

D. $X = $ black, $Bi_2O_3$, $Y = $ colourless $KBiO_2$, $Z = KBiO_3$

**Answer: C**

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**15.** The solubility of a sparingly soluble salt $A(OH)_2$ (mol .wt.192.3) is 19.23 /litre assuming 80% ionisation at 300 K is :

A. 1.0970

B. 12.9030

C. 13.2041

D. 12.0000

Answer: C

16. In graph of atomic volume versus atomic weight , the elements corresponding to peaks in the curve belong to

A. Group 1

B. Group 18

C. Group 4

D. Group 14

Answer: A

**17.** If the radius of first Bohr's of hydrogen is x , then de - Broglie wavelength of electron in its 3rd orbit is

A. $2\pi r$

B. $6\pi x$

C. 9x

D. $\dfrac{x}{3}$

**Answer: B**

**18.** $SO_2$ is considered as an air pollutant because

A. Its concentration increases with temperature increases of atmosphere.

B. It is used as an insecticide which is air pollutant

C. It reacts with $O_2$ and $H_2O$ to produce acid rain

D. It is a strong oxidant and oxidant oxidizes other components of

 atmosphere

**Answer: C**

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**19.** Which of the following mineral does not contain Al?

A. Cryolite

B. Mica

C. Feldspar

D. Fluorspar

**Answer: D**

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**20.** The dissociation equilibrium of a gas $AB_2$ can be represented as, $2AB_2(g) \rightleftharpoons 2AB(g) + B_2(g)$. The degree of disssociation is 'x' and is small compared to 1. The expression relating the degree of dissociation (x) with equilibrium constant $k_p$ and total pressure P is

A. $(2K_P/P)^{\frac{1}{2}}$
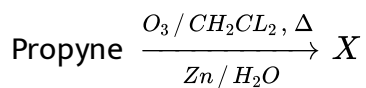
B. $K_P/P$

C. $2K_P/P$

D. $(2K_P/P)^{\frac{1}{3}}$

**Answer: D**

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**21.** One mole of a monatomic gas at pressure 2 atm ,279 K taken to final pressure 4 atm by a reversible path described by $P/V$ = constant . Calculate the magnitude of $\dfrac{\Delta E}{w}$ for the process .
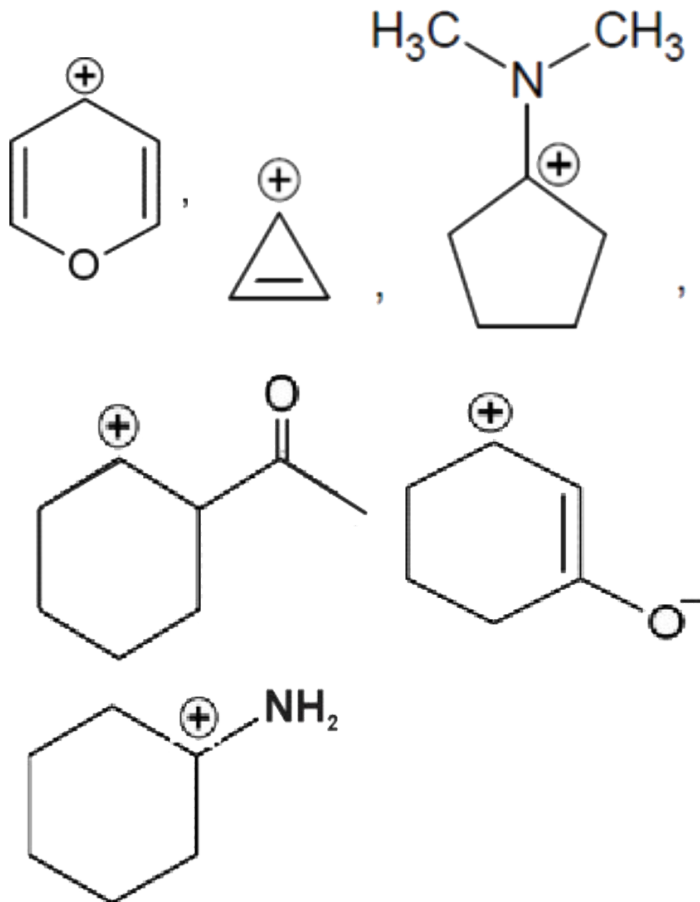
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**22.** The number of carbonyl carbon in the products X is

Propyne $\xrightarrow[Zn / H_2O]{O_3 / CH_2CL_2, \ \Delta}$ X

**23.** How many of the following intermediates heve at least one contributing structure in which all atoms have their octet complete ?
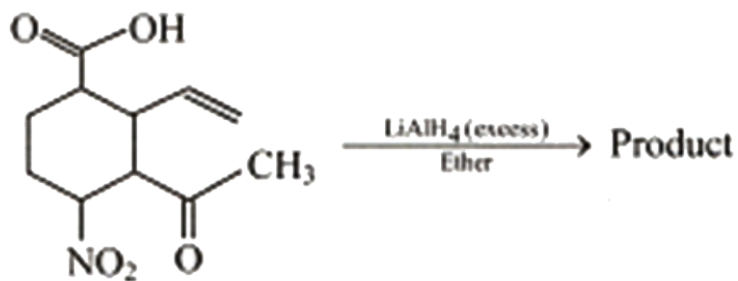
**24.** The number of essential amino acids among the following is ..........

Histidine, Glycine, valine , Alanine, Aspartic acid, Lysine, methionine.

**25.** The number of $\pi$ bonds in the major product will be



$$\xrightarrow[\text{Ether}]{\text{LiAlH}_4\,(\text{excess})} \text{Product}$$