# JEE MAIN-2018

## CHEMISTRY

This section contains 30 multiple choice questions. Each question has 4 choices (1), (2), (3) and (4) for its answer, out of which Only One is correct.

**61.** Total number of lone pair of electrons in $I_3^-$ ion is :

(1) 9

(2) 12

(3) 3

(4) 6

**62.** Which of the following salts is the most basic in aqueous solution?

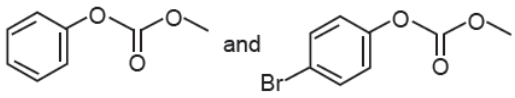
(1) $FeCl_3$

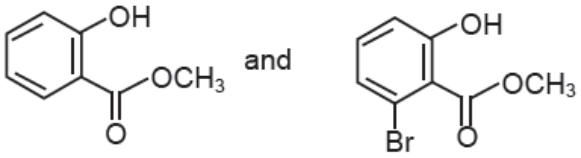
(2) $Pb(CH_3COO)_2$

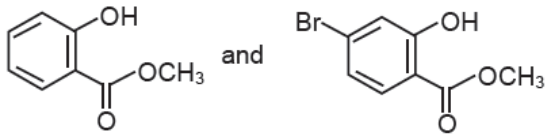
(3) $Al(CN)_3$

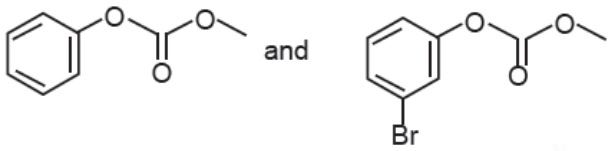
(4) $CH_3COOK$

**63.** Phenol reacts with methyl chloroformate in the presence of $NaOH$ to form product $A$. A react with $Br_2$ to form product $B$. $A$ and $B$ are respectively:

(1) 

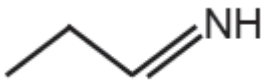

(2) 

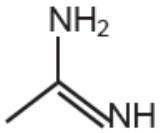
(3) 


(4) 


**64.** The increasing order of basicity of the following compounds is :

(a) 


(b) 


(c) 


(d) 


(1) $(b)<(a)<(d)<(c)$

(2) $(d)<(b)<(a)<(c)$

(3) $(a)<(b)<(c)<(d)$

(4) $(b)<(a)<(c)<(d)$

**65.** An alkali is titrated against an acid with methyl orange as indictor, which of the following is a correct combination?

| | Base | Acid | End point |
|---|---|---|---|
| (1) | Weak | Strong | Yellow to pinkish red |
| (2) | Strong | Strong | Pink to colourless |
| (3) | Weak | Strong | Colourless to pink |
| (4) | Strong | Strong | Pinkish red to yellow |

**66.** The trans-alkenes are formed by the reduction of alkynes with :

(1) $Na/liq.NH_3$

(2) $Sn-HCl$

(3) $H_2-Pd/C, BaSO_4$

(4) $NaBH_4$

**67.** The ratio of mass percent of $C$ and $H$ of an organic compound $(C_XH_YO_Z)$ is $6:1$ . If one molecule of the above compound $(C_XH_YO_Z)$ contains half as much oxygen as required to burn one molecule of compound $C_XH_Y$ completely to $CO_2$ and $H_2O$ .The empirical formula of compound $C_XH_YO_Z$ is :

(1) $C_3H_4O_2$

(2) $C_2H_4O_3$

(3) $C_3H_6O_3$

(4) $C_2H_4O$

**68.** Hydrogen peroxide oxidises $\left[Fe(CN)_6\right]^{4-}$ to $\left[Fe(CN)_6\right]^{3-}$ in acidic medium but reduces $\left[Fe(CN)_6\right]^{3-}$ to $\left[Fe(CN)_6\right]^{4-}$ in alkaline medium. The other products formed are, respectively.

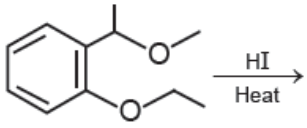
(1) $H_2O$ and $(H_2O + O_2)$

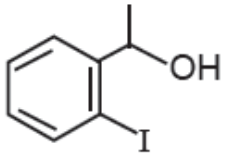
(2) $H_2O$ and $(H_2O + OH^-)$

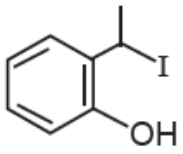
(3) $(H_2O + O_2)$ and $H_2O$

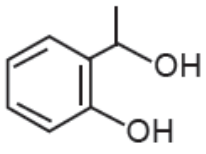
(4) $(H_2O + O_2)$ and $(H_2O + OH^-)$

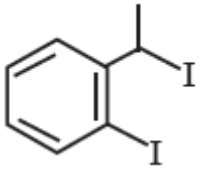
**69.** The major product formed in the following reaction is :




(1) 


(2) 


(3) 


(4) 

**70.** How long (apporoximate) should water be electrolysed by passing through 100 amperes current so that the oxygen released can completely burn 27.66 g of diborane?

(Atomic weight of $B = 10.8u$ )

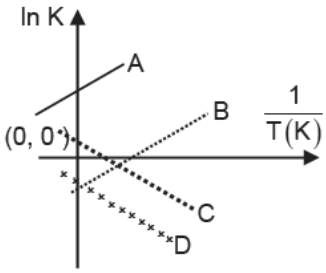
(1) 3.2 hours

(2) 1.6 hours

(3) 6.4 hours

(4) 0.8 hours

**71.** Which of the following lines correctly show the temperature dependence of equilibrium constant, $K$, for an exothermic reaction ?




(1) C and D

(2) A and D

(3) A and B

(4) B and C

**72.** At $518°C$, the rate of decomposition of a sample of gaseous acetaldehyde, initially at a pressure of 363 Torr, was 1.00 Torr $s-1$ when 5% had reacted and 0.5 Torr $s-1$ when 33% had reacted. The order of the reaction is :

(1) 1

(2) 0

(3) 2

(4) 3

**73.** Glucose on prolonged heating with HI gives :

(1) Hexanoic acid

(2) 6-iodohexanal

(3) *n*-Hexane

(4) 1-Hexene

**74.** Consider the following reaction and statements :

$$\left[Co\left(NH_3\right)_4 Br_2\right]^+ + Br^- \rightarrow \left[Co\left(NH_3\right)_3 Br_3\right] + NH_3$$

(I)Two isomers are produced if the reactant complex ion is a cis-isomer.

(II) Two isomers are produced if the reactant complex ion is a *tran*-isomer.

(III) Only one isomer is produced if the reactant complex ion is a *trans*-isomer.

(IV) Only one isomer is produced if the reactant complex ion is a *cis*-isomer.

The correct statements are :

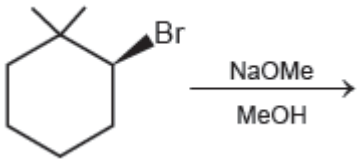
(1) (III) and (IV)

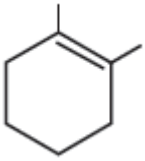
(2) (II) and (IV)

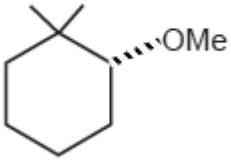
(3) (I) and (II)

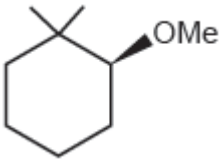
(4) (I) and (III)

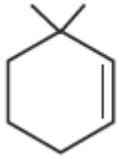
**75.** The major product of the following reaction is :



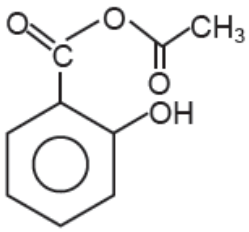

(1) 

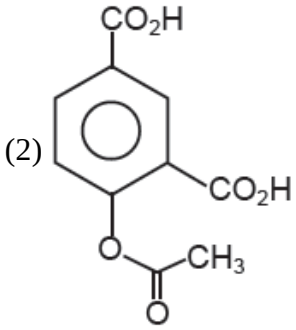
(2) 

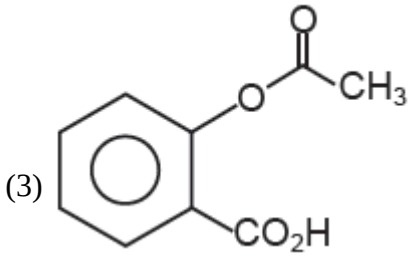

(3) 

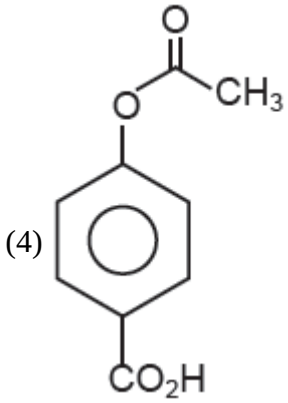

(4) 

**76.** Phenol on treatment with $CO_2$ in the presence of $NaOH$ followed by acidification produces compound $X$ as the major product. $X$ on treatment with $(CH_3CO)_2O$ in the presence of catalytic amount of $H_2SO_4$ produces :

(1) 

(2) 

(3) 

(4) 

**77.** An aqueous solution contains an unknown concentration of $Ba^{2+}$. When $50\,mL$ of a $1M$ solution of $Na_2SO_4$ is added, $BaSO_4$ just begins to precipitate. The final volume is $500\,mL$. The solubility product of $BaSO_4$ is $1\times10^{-10}$. What is the original concentration of $Ba^{2+}$.

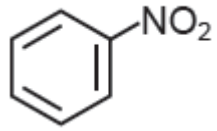
(1) $1.1\times10^{-9}M$

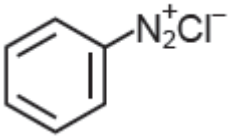
(2) $1.0\times10^{-10}M$

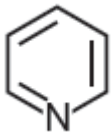
(3) $5\times10^{-9}M$

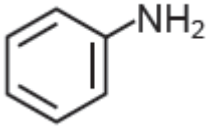
(4) $2\times10^{-9}M$

**78.** Which of the following compounds will be suitable for Kjeldahl's method for nitrogen estimation ?

(1) 

(2) 

(3) 

(4) 

**79.** When metal '$M$' is treated with $NaOH$, a white gelatinous precipitate '$X$' is obtained, which is soluble in excess of $NaOH$. Compound '$X$' when heated strongly gives an oxide which is used in chromatography as an adsorbent. The metal '$M$' is :

(1) Al

(2) Fe

(3) Zn

(4) Ca

**80.** An aqueous solution contains $0.10M\ H_2S$ and $0.20M\ HCl$. If the equilibrium constant for the formation of $HS^-$ from $H_2S$ is $1.0\times10^{-7}$ and that of $S^{2-}$ from $HS^-$ ions is $1.2\times10^{-13}$ then the concentration of $S^{2-}$ ions in aqueous solution is :

(1) $6\times10^{-21}$

(2) $5\times10^{-19}$

(3) $5\times10^{-8}$

(4) $3\times10^{-20}$

**81.** The recommended concentration of fluoride ion in drinking water is up to $1\ \text{ppm}$ as fluoride ion is required to made teeth enamel harder by converting $\left[3Ca_3(PO_4)_2 \cdot Ca(OH)_2\right]$ to :

(1) $\left[3Ca_3(PO_4)_2 \cdot CaF_2\right]$

(2) $\left[3\{Ca(OH)_2\} \cdot CaF_2\right]$

(3) $\left[CaF_2\right]$

(4) $\left[3(CaF_2) \cdot Ca(OH)_2\right]$

**82.** The compound that does not produce nitrogen gas by the thermal decomposition is :

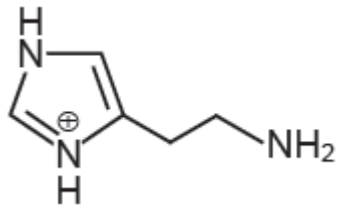
(1) $NH_4NO_2$

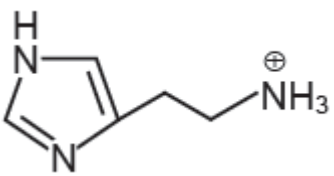
(2) $(NH_4)_2SO_4$

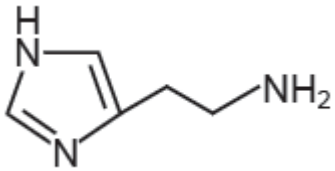
(3) $Ba(N_3)_2$

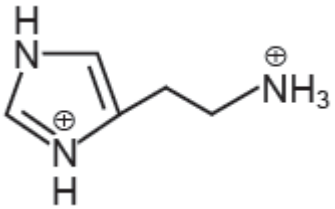
(4) $(NH_4)_2Cr_2O_7$

**83.** The predominant form of histamine present in human blood is ( $pK_a$, Histidine $= 6.0$ )

(1) 

(2) 

(3) 

(4) 

**84.** The oxidation states of Cr in $\left[Cr(H_2O)_6\right]Cl_3$, $\left[Cr(C_6H_6)_2\right]$, and $K_2\left[Cr(CN)_2(O)_2(O_2)(NH_3)\right]$ respectively are :

(1) $+3, 0, \text{and} +6$

(2) $+3, 0, \text{and} +4$

(3) $+3, +4, \text{and} +6$

(4) $+3, +2, \text{and} +4$

**85.** Which type of 'defect' has the presence of cations in the interstitial sites ?

(1) Frenkel defect

(2) Metal deficiency defect

(3) Schottky defect

(4) Vacancy defect

**86.** The combustion of benzene (I) gives $CO_2(g)$ and $H_2O(l)$. Given that heat of combustion of benzene at constant volume is $-3263.9 kJ\,mol^{-1}$ at $25°C$; heat of combustion $\left(\text{in } kJ\,mol^{-1}\right)$ of benzene at constant pressure will be : $\left(R = 8.314 JK^{-1}mol^{-1}\right)$

(1) 3260

(2) –3267.6

(3) 4152.6

(4) –452.46

**87.** Which of the following are Lewis acids?

(1) $PH_3$ and $SiCl_4$

(2) $BCl_3$ and $AlCl_3$

(3) $PH_3$ and $BCl_3$

(4) $AlCl_3$ and $SiCl_4$

**88.** Which of the following compounds contain(s) no covalent bond(s) ?

$KCl, PH_3, O_2, B_2H_6, H_2SO_4$

(1) KCl

(2) $KCl, B_2H_6$

(3) $KCl, B_2H_6, PH_3$

(4) KCl, $H_2SO_4$

**89.** For 1 molal aqueous solution of the following compounds, which one will show the highest freezing point ?

(1) $\left[Co\left(H_2O\right)_4 Cl_2\right]Cl.2H_2O$

(2) $\left[Co\left(H_2O\right)_3 Cl_3\right]3H_2O$

(3) $\left[Co\left(H_2O\right)_6\right]Cl_3$

(4) $\left[Co\left(H_2O\right)_5 Cl\right]Cl_2.H_2O$

**90.** According to molecular orbital theory, which of the following will not be a viable molecule ?

(1) $H_2^-$

(2) $H_2^{2-}$

(3) $He_2^{2+}$

(4) $He_2^+$