



QUESTION PAPER WITH SOLUTIONS OF MPPET - 2013 (HELD ON 21TH APRIL SUNDAY, 2013)

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[CHEMISTRY] SET - A

- 151.** The enthalpies of combustion of carbon and carbon monoxide are -393.5 kJ and $-283 \text{ kJ mole}^{-1}$ respectively. The enthalpy of formation of carbon monoxide is :
- (A) $110.5 \text{ kJ mole}^{-1}$ (B) $676.5 \text{ kJ mole}^{-1}$
(C) $-676.5 \text{ kJ mole}^{-1}$ (D) $-110.5 \text{ kJ mole}^{-1}$
- 151. (D)** $\Delta H = H_p - H_R$
- $$= -393.5 - (-283)$$
- $$= -110.5 \text{ kJ / mole}$$
- 152.** The quantity of K in a rate of expression :
- (A) is independent of concentration of reactants
(B) is called Arrhenius constant
(C) is dimensionless
(D) is independent of temperature
- 152. (A)** is independent of concentration of reactants
- 153.** The half-life of radioactive sodium is 15.0 hours. How many hours would it take for 64gm of sodium to decay one-eighth of its original value ?
- (A) 3 (B) 15
(C) 30 (D) 45
- 153. (D)** In radioactivity, always first order reaction
- $$K = \frac{0.693}{t_{1/2}} = \frac{0.693}{15}$$
- Now, $t = \frac{2.303}{k} \log \left(\frac{A_0}{A_0 - x} \right)$
- $$= \frac{2.303}{0.693} \times 15 \log \left(\frac{64}{8} \right)$$
- $$= \frac{2.303}{0.693} \times 15 \times 3 \log 2$$
- $$= 45 \text{ hrs.}$$
- [$\therefore 2.303 \times \log 2 = 0.693$]
- 154.** Which of the following is not true for the reaction $\text{Fe}^{3+} + \text{e}^- \rightarrow \text{Fe}^{2+}$?
- (A) Fe^{3+} being reduced
(B) Oxidation state of Fe has changes
(C) Fe^{3+} could be referred to an oxidising agent in this reaction
(D) both Fe^{3+} and Fe^{2+} are called acid radicals
- 154. (D)** both Fe^{3+} and Fe^{2+} are called acid radicals
- 155.** In the reaction $\text{Pb}(s) + \text{Cu}^{2+} \rightarrow \text{Pb}^{2+}(aq) + \text{Cu}(s)$ which is reducing agent ?
- (A) $\text{Pb}^{2+}(aq)$ (B) $\text{Cu}^{2+}(aq)$
(C) $\text{Pb}(s)$ (D) $\text{Cu}(s)$
- 155. (C)** $\text{Pb}(s)$
- 156.** The phenomenon of negative catalysis is :
- (A) autocatalysis (B) induced catalysis
(C) inhibition (D) enzyme catalysis
- 156. (C)** inhibition
- 157.** is the gold number of hydrophilic colloid then greater is its protective power.
- (A) higher (B) lower
(C) constant (D) none of these
- 157. (B)** lower
- 158.** Metallurgy of iron when limestone is added to blast furnace calcium ion ends up in :
- (A) Slag (B) Gangue
(C) Metallic calcium (D) Calcium carbonate
- 158. (A)** Slag
- 159.** Identify the least stable ion amongst the following:
- (A) Be^- (B) Li^-
(C) B^- (D) C^-



159. (B) Li^-
160. Transition metals have general electronic configuration :
- (A) ns^2nd^{1-10} (B) $ns^2nd^1(n-1)d^{1-10}$
 (C) $ns^{1-2}(n-1)d^{1-10}$ (D) $ns^2np^6(n-1)d^{1-10}$
- 160.(C) $ns^{1-2}(n-1)d^{1-10}$
161. Variable valency is a general feature of :
- (A) S-block elements (B) p-block elements
 (C) d-block elements (D) (B) and (C) both
- 161.(D) (B) and (C) both
162. The amount of energy released when 10^6 atoms of iodine in vapour state are converted to I^- ions is $4.9 \times 10^{-13} J$. What will be electron affinity of iodine in eV per atoms ?
- (A) 2.0 (B) 2.5
 (C) 2.75 (D) 3.06
- 162.(D) $I + e^- \rightarrow I^-$
- For, 10^6 atoms - $4.9 \times 10^{-13} J$
- $$1 \text{ atom} - \left(\frac{4.9 \times 10^{-13}}{10^6} \right) J$$
- $$1 \text{ atom} - \left(4.9 \times \frac{1.6}{1.6} \times 10^{-19} \right) J$$
- $$1 \text{ eV} = 1.6 \times 10^{-19} J$$
- $$1 \text{ atom} - \left(\frac{4.9}{1.6} = 3.06 \right) eV$$
163. Sodium hydride when dissolved in water produces:
- (A) acidic solution (B) basic solution
 (C) neutral solution (D) cannot say
- 163.(B) basic solution
164. When zinc reacts with very dilute nitric acid, it produces :
- (A) NH_4NO_3 (B) NO
 (C) NO_2 (D) H_2
164. (A) NH_4NO_3
165. A black sulphide when reacts with ozone becomes white. The white compound is :
- (A) $ZnSO_4$ (B) $PbSO_4$

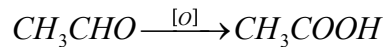


165. (D) $CaSO_4$
166. Strongest reducing agent is :
- (A) F^- (B) Cl^-
 (C) Br^- (D) I^-
166. (A) F^-
167. The formula of haematite is :
- (A) Fe_3O_4 (B) Fe_2O_3
 (C) $FeCO_3$ (D) FeS_2
- 167.(B) Fe_2O_3
168. Which of the following forms with an excess of CN^- ion, a complex having coordination number two :
- (A) Cu^{2+} (B) Ag^+
 (C) Ni^{2+} (D) Fe^{2+}
- 168.(B) Ag^+
169. The IUPAC name of $Ni(CO)_4$ is :
- (A) tetracarbonylnickelate (O)
 (B) tetracarbonylnickelate (II)
 (C) tetracarbonylnickel (O)
 (D) tetracarbonylnickel (II)
- 169.(C) tetracarbonylnickel (O)
170. A 5 molar solution of H_2SO_4 acid is diluted from 1 litre to 10 litre. What is normality of solution ?
- (A) 0.25 N (B) 1 N
 (C) 2 N (D) 7 N
- 170.(B) Initial mole = Final mole
- $$M \times V = M_{new} \times V$$
- $$5 \times 1 = M_{new} \times 10$$
- $$M_{new} = \frac{1}{2} = 0.5$$
- $$N = M_{new} \times n - \text{factor}$$
- $$N = 0.5 \times 2 = 1 N$$
171. Ferric ions form prussian blue coloured precipitate due to
- (A) $KMnO_4$ (B) $K_4Fe(CN)_6$
 (C) $Fe(OH)_3$ (D) $Fe_4[Fe(CN)_6]_3$



- 171.(D) $Fe_4 [Fe(CN)_6]_3$
172. The volume of water to be added to 100 ml of 0.5N H_2SO_4 acid solution to get decinormal concentration is :
 (A) 400 ml (B) 450 ml
 (C) 500 ml (D) 100 ml
- 172.(A) $N = M \times n - factor$
 $0.5 = M \times 2$
 $M = \frac{0.5}{2}$
- Similarly, $M_{new} = \frac{0.1}{2}$
- Initial mmole = final mmole
- $$\frac{0.5}{2} \times 100 = \frac{0.1}{2} \times (100 + x)$$
- $x = 400 \text{ ml}$ (Since $x \text{ ml}$ water is added)
173. Which of the following is formed when CO_2 gas is passed through aqueous solution sodium chromate ?
 (A) $Cr(OH)_3$ is precipitated
 (B) Yellow solution of $Cr_2(CO_3)_3$ is formed
 (C) Orange solution of $Na_2Cr_2O_7$ is formed
 (D) No reaction
- 173.(C) Orange solution of $Na_2Cr_2O_7$ is formed
174. Compound contains 38.8% C, 16% H, 42.5% N. The formula of compound will be :
 (A) CH_3NH_2 (B) CH_3CN
 (C) C_2H_5CN (D) $CH_2(NH_2)_2$
- 174.(A)
- | Element | % | Mole | No. of atom |
|---------|------|---------------|-------------|
| C | 38.8 | $38.8/12=3.2$ | $3.2/3=1$ |
| H | 16 | $16/1=16$ | $16/3=5$ |
| N | 42.5 | $42.5/14=3$ | $3/3=1$ |
175. Compound containing only carbon, hydrogen and oxygen has a molecular weight 44.0. On complete oxidation it is converted into a compound of molecular weight of 60.0. The compound is :
 (A) an aldehyde (B) an acid
 (C) an alcohol (D) an ether

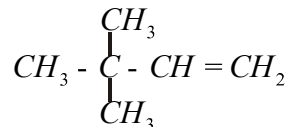
- 175.(A) Aldehyde



M.wt 44

M.w. 60

176. The IUPAC name of the following compound is :



- (A) 3,3,3-trimethyl-1-propene
 (B) 3,3-dimethyl-1-butene
 (C) 1,1,1-trimethyl-2-propene
 (D) 2,2-dimethyl-3-butene

176. (B) 3,3-dimethyl-1-butene

177. Which type of isomerism is shown by diethyl ether and methyl propyl ether ?

- (A) chain (B) functional
 (C) metamerism (D) position

177. (C) metamerism

178. That which is not used as gaseous fuel :

- (A) gasoline (B) acetylene
 (C) carbon monoxide (D) methane

178. (B) acetylene

179. The petrol of octane number 80 has :

- (A) 80% n-heptane+20% iso-octane
 (B) 20% n-heptane+80% iso-octane
 (C) 20% n-heptane+80% n-octane
 (D) 80% n-heptane+20% n-octane

179. (B) 20% n-heptane+80% iso-octane

180. Structure of diethyl ether is confirmed by :

- (A) Kolbe's synthesis
 (B) Frankland's synthesis
 (C) Williamson's synthesis
 (D) Wurtz synthesis

180. (C) Williamson's synthesis

181. CH_3CHO gives 1,1-Dichloroethane with is :

- (A) PCl_5 (B) S_2Cl_2
 (C) Cl_2 (D) HCl

181. (A) PCl_5

182. Which of the following acids cannot be prepared by Grignard reagent ?

- (A) Acetic acid (B) Succinic acid
 (C) Formic acid (D) All of these



- 182.(C) Formic acid
183. Chlorobenzene is prepared commercially by :
 (A) Friedal-Craft's reaction
 (B) Rasching process
 (C) Grignard's reagent
 (D) Wurtz-Fittig reaction
183. (B) Rasching process
184. Phenol $\xrightarrow[\Delta]{Zn}$ x . The compound x on acylation gives aliphatic aromatic ketone. The reaction is :
 (A) Gatterman's reaction
 (B) Friedal-Craft's reaction
 (C) Wurtz reaction
 (D) none of these
- 184.(B) Friedal-Craft's reaction
185. Which of the following reduces Tollen's reagent?
 (A) Cane sugar (B) Starch
 (C) Glucose (D) All of these
- 185.(C) Glucose
186. Glucose converts into alcohol by action of enzyme :
 (A) Zymase (B) Invertase
 (C) Maltose (D) Diastase
- 186.(A) Zymase
187. Amino acids are formed from the hydrolysis of
 (A) nucleic acid (B) carbohydrates
 (C) fats (D) proteins
- 187.(D) proteins
188. Which of the following called polyamide ?
 (A) Rayon (B) Nylon
 (C) Orlon (D) Terylene
- 188.(B) Nylon
189. Which of the following is an example of condensation polymer ?
 (A) Nylon
 (B) Bakelite
 (C) Urea formaldehyde resin
 (D) All of these
- 189.(D) All of these
190. Which has maximum number of atoms ?
 (A) 24 gms of $C_{(12)}$ (B) 56 gms of $Fe_{(56)}$
 (C) 27 gms of $Al_{(27)}$ (D) 108 gms of $Ag_{(108)}$

190.(A) (a) Mole of carbon = $\frac{24}{12} = 2$

So, no. of atom = $2N_A$

(b) No. of atom = N_A

(c) No. of atom = N_A

(d) No. of atom = N_A

191. Which has the maximum number of unpaired d-electrons ?

(A) Ni^{3+} (B) Cu^+

(C) Zn^{2+} (D) Fe^{2+}

191.(D) $Ni^{3+} - 3$ unpair e^-

$Cu^+ - 0$ unpair e^-

$Zn^{2+} - 0$ unpair e^-

$Fe^{2+} - \dots\dots\dots 4s^0 3d^6$



4 unpair e^-

192. Bond order of species is as following :

(A) $O_2 > O_2^+ > O_2^-$ (B) $O_2^+ > O_2 > O_2^-$

(C) $O_2^- > O_2 > O_2^+$ (D) $O_2^+ > O_2^- > O_2$

- 192.(B) Use bond order > 14

$\sigma 1s, \sigma^* 1s, \sigma 2s, \sigma^* 2s, \sigma 2p_z,$

$\pi 2p_x = 2\pi p_y, \pi^* 2p_x = \pi^* 2p_y, \sigma^* 2p_z$

For $O_2 = 2.0, O_2^+ = 2.5, O_2^- = 1.5$

So $O_2^+ > O_2 > O_2^-$

193. Which compound has electrovalent bond ?

(A) H_2O_2 (B) CCl_4

(C) $NaBr$ (D) $CHCl_3$

- 193.(C) $NaBr$

194. Weight of urea required to prepare 200ml of 2M solution will be :

(A) 12 gm (B) 24 gm

(C) 20 gm (D) 60 gm



194.(B) Urea (NH_2CONH_2)

$$\text{mmole of urea} = 200 \times 2$$

$$\text{mole} = 0.4$$

$$\text{wt of urea} = 0.4 \times 60 = 24 \text{ gm}$$

195. In Bragg's equation $n\lambda = 2d \sin \theta$; represents:

- (A) Number of moles
(B) The principal quantum number
(C) Avogadro's number
(D) Order of reflection

195. (D) Order of reflection

196. The difference between number of Neutrons and Protons is positive for:

- (A) Hydrogen atom (B) Deuterium atom
(C) Tritium atom (D) None of these

196. (C) Tritium atom

197. For the reaction $2NO_{(g)} + Cl_{2(g)} \rightleftharpoons 2NOCl_{(g)}$ which is true?

(A) $K_p = K_c \times RT$ (B) $K_p = K_c (RT)^2$

(C) $K_p = \frac{K_c}{RT}$ (D) $K_p = \frac{K_c}{(RT)^2}$

197.(C) $\Delta n_g = 2 - 3 = -1$

$$K_p = K_c (RT)^{\Delta n_g} = K_c (RT)^{-1}$$

$$K_p = \frac{K_c}{RT}$$

198. $CaCO_3(s) \rightleftharpoons CaO(s) + CO_2(g)$,

$$\Delta H = 110 \text{ kJ}$$
 The pressure of CO_2

- (A) increases on adding catalyst
(B) decreases if T is raised
(C) increases if T is raised
(D) increases if inert gas is passed keeping T constant

198.(C) $\Delta H = 110 \text{ KJ}$ endothermic reaction

If we increase temperature in this reaction. Reaction will proceed in forward direction.

199. pH of water is 7.0 at 25°C , if water is heated to 80°C :

- (A) pH will increase (B) pH will decrease
(C) pH remains 7.0
(D) H^+ ion concentration will increase but OH^- ion concentration will decrease

199.(B) On increasing temperature, conc. of H^+ ion in solution increases.

$$\therefore pH = -\log[H^+]$$

so pH will decrease.

200. In the reaction $H_2O + HCl \rightarrow H_3O^+ + Cl^-$, the species that acts as Bronsted base is:

- (A) H_2O (B) HCl
(C) H_3CO^+ (D) Cl^-

200.(A) H_2O