CAREER POINT

NEET Exam. 2019 (5th May 2019)

(Paper & Solution)

Code – S2

Q.136 In which case change in entropy is negative ?

(1) Sublimation of solid to gas

(2) $2H(g) \rightarrow H_2(g)$

(3) Evaporation of water

(4) Expansion of a gas at temperature

Ans. **[2]**

Sol. (1) Evaporation of water $\Delta S = \oplus$

(2) Expansion of gas at constant temperature = $\oplus$

(3) $S \rightarrow g \oplus$

(4) $\underset{(g)}{2H} \longrightarrow \underset{(g)}{H_2}$ Θ

Q.137 For the chemical reaction $N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$

(1) $-\frac{d[N_2]}{dt} = \frac{1}{2}\frac{d[NH_3]}{dt}$

(2) $3\frac{d[H_2]}{dt} = 2\frac{d[NH_3]}{dt}$

(3) $-\frac{1}{3}\frac{d[H_2]}{dt} = -\frac{1}{2}\frac{d[NH_3]}{dt}$

(4) $-\frac{d[N_2]}{dt} = 2\frac{d[NH_3]}{dt}$

Ans. **[1]**

Sol. $N_2 + 3H_2 \rightleftharpoons 2NH_3$

$$-\frac{dN_2}{dt} = -\frac{1}{3}\frac{dH_2}{dt} = +\frac{1}{2}\frac{dNH_3}{dt}$$

$$-\frac{dN_2}{dt} = +\frac{1}{2}\frac{d[NH_3]}{dt}$$

Q.138 Which of the following diatomic molecular species has only π bonds according to Molecular Orbital Theory?

(1) C_2 (2) Be_2 (3) O_2 (4) N_2

Ans. **[1]**

Sol. $C_2 = \sigma 1s^2\ \sigma^* 1s^2\ \sigma 2s^2\ \sigma^* 2s^2\ \pi 2p_x^2\ \pi 2p_y^2$

12 e^- has only π bonds according to M.O.T.

In C_2 molecule, only π electron occupied the bonding molecular orbital.

Q.139 Which of the following is **incorrect** statement ?

(1) GeX_4(X = F, Cl, Br, I) is more stable than GeX_2

(2) SnF_4 is ionic in nature

(3) PbF_4 is covalent in nature

(4) $SiCl_4$ is easily hydrolysed

Ans. **[3]**

Sol. PbF_4 is an ionic compound.

Q.140 Under isothermal condition, a gas at 300 K expands from 0.1 L to 0.25 L against a constant external pressure of 2 bar. The work done by the gas is [Given that 1 L bar = 100 J]

(1) 25 J (2) 30 J (3) –30 J (4) 5 kJ

Ans. **[3]**

Sol. Thermodynamics

$W = -P_{ext}\Delta V$

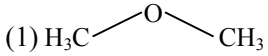
$= -2(bar)\ (0.15\ L)$

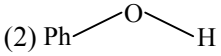
$= -0.3$ bar :

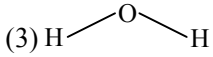
$= -0.3 \times 100$ J

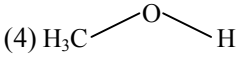
$= -30$ J

Q.141 The compound that is most difficult to protonate is :

(1) 

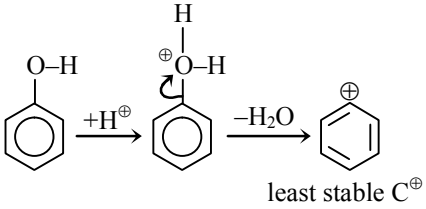
(2) 

(3) 

(4) 

Ans. **[2]**

Sol.



least stable $C^{\oplus}$

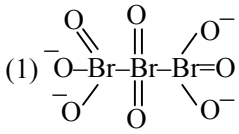
Q.142 Which of the following is an amphoteric hydroxide ?

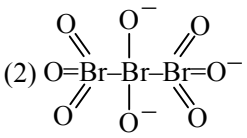
(1) $Mg(OH)_2$ (2) $Be(OH)_2$ (3) $Sr(OH)_2$ (4) $Ca(OH)_2$

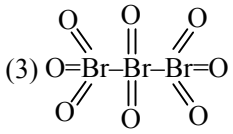
Ans. **[2]**

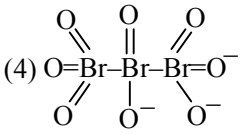
Sol. $Be(OH)_2$ is amphoteric in nature.

Q.143 The correct structure of tribromooctaoxide is -

(1) 

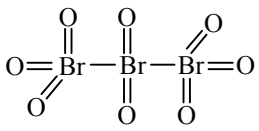
(2) 

(3) 

(4) 

Ans. **[3]**

Sol. Br_3O_8



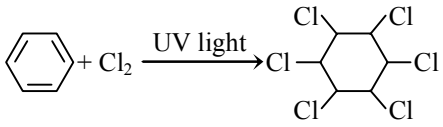
Q.144 The biodegradable polymer is -

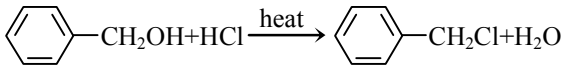
(1) nylon-6 (2) Buna-S (3) nylon-6, 6 (4) nylon 2-nylon 6

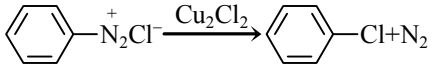
Ans. **[4]**

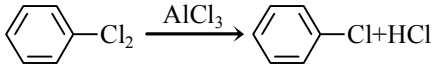
Sol. Biodegradable polymer → Nylon-2-Nylon-6.

Q.145 Among the following, the reaction that proceeds through an electrophilic substitution, is -

(1) 

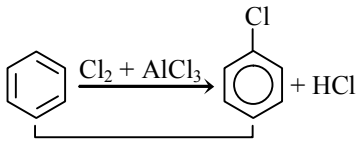
(2) 

(3) 

(4) 

Ans. **[4]**

Sol.



Electrophilic substitution reaction

Q.146 Match the following :

(a)	Pure nitrogen	(i)	Chlorine
(b)	Haber process	(ii)	Sulphuric acid
(c)	Contact process	(iii)	Ammonia
(d)	Deacon's process	(iv)	Sodium azide or Barium azide

Which of the following is the correct option ?

	(a)	**(b)**	**(c)**	**(d)**
(1)	(iii)	(iv)	(ii)	(i)
(2)	(iv)	(iii)	(ii)	(i)
(3)	(i)	(ii)	(iii)	(iv)
(4)	(ii)	(iv)	(i)	(iii)

Ans. **[2]**

Sol. Pure N_2 $BaN_3 \rightarrow Ba + N_2$

Haber process $N_2 + 3H_2 + 2NH_3$

Contact process $2SO_2 + O_2 + 2SO_3$

Deacon's process $HCl + O_2 \xrightarrow{CuCl_2} H_2O + Cl_2$

Q.147 The number of sigma (σ) and pi (π) bonds in pent-2-en-4-yne is -

(1) 11 σ bonds and 2 π bonds (2) 13 σ bonds and no π bond

(3) 10 σ bonds and 3 π bonds (4) 8 σ bonds and 5π bonds

Ans. **[3]**

Sol. H–C≡C – CH = CH–CH_3

10σ + 3 π-Bonds

Q.148 Enzymes that utilize ATP is phosphate transfer require an alkaline earth metal (M) as the cofactor. M is -

(1) Ca (2) Sr (3) Be (4) Mg

Ans. **[4]**

Sol. Mg → In ATP Phosphate transfer

Q.149 Identify the incorrect statement related to PCl_5 from the following -

(1) Axial P–Cl bonds are longer than equatorial P–Cl bonds

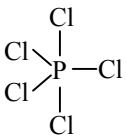
(2) PCl_5 molecule is non-reactive

(3) Three equatorial P–Cl bonds make an angle of 120º with each other

(4) Two axial P–Cl bonds make an angle of 180º with each other

Ans. **[2]**

Sol.



Three equatorial bonds and two axial bonds.

Due to unsymmetry PCl_5 is reactive.

Q.150 If the rate constant for a first order reaction is k, the time (t) required for the completion of 99 % of the reaction is given by -

(1) t = 4.606/k (2) t = 2.303/k (3) t = 0.693/k (4) t = 6.909/k

Ans. **[1]**

Sol. Chemical kinetics

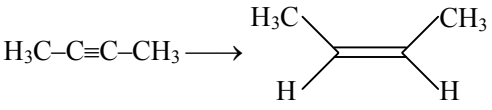
$$t = \frac{2.3}{K}\log\frac{a}{a-x}$$

$$= \frac{2.3}{k}\log\frac{1.0}{1}$$

$$= \frac{2.303\times 2}{k}$$

$$t_{99\%} = \frac{6.606}{k} = 4.606/k$$

Q.151 The most suitable reagent for the following conversion, is :



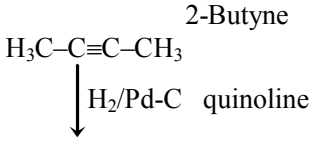
cis-2-butene

(1) Zn / HCl (2) Hg^{2+} / H^+, H_2O

(3) Na / liquid NH_3 (4) H_2, Pd/C, quinoline

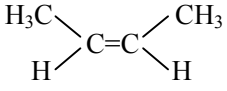
Ans. **[4]**

Sol.



2-Butyne

H_2/Pd-C quinoline



Cis-2-Butene

Q.152 The manganate and permanganate ions are tetrahedral due to -

(1) The π-bonding involves overlap of p-orbitals of oxygen with p-orbtials of manganese

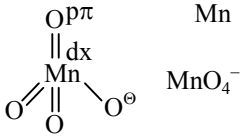
(2) The π-bonding involves overlap of d-orbitals of oxygen with d-orbitals of manganese

(3) The π-bonding involves overlap of p-orbitals of oxygen with d-orbitals of manganese

(4) There is no π-bonding

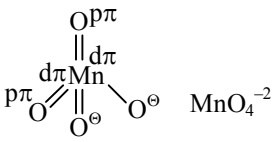
Ans. **[3]**

Sol. Structure of permanganate ion



MnO_4^-

and manganate ion



MnO_4^{-2}

Q.153 For a cell involving one electron $E^{\Theta}_{cell} = 0.59$ V at 298 K, the equilibrium constant for the cell reaction is :

[Given that $\frac{2.303\,kT}{F} = 0.059$ V at T = 298 K]

(1) 1.0×10^{10} (2) 1.0×10^{30} (3) 1.0×10^{2} (4) 1.0×10^{5}

Ans. **[1]**

Sol. $E^{o}_{cell} = \frac{0.06}{n} \log_{10} k$

$0.6 = \frac{0.06}{1} \log_{10} k$

$\log_{10} k = 10$

$k = 10^{10}$

Q.154 pH of a saturated solution of $Ca(OH)_2$ is 9. The solubility product (K_{sp}) of $Ca(OH)_2$ is -

(1) 0.125×10^{-15} (2) 0.5×10^{-10} (3) 0.5×10^{-15} (4) 0.25×10^{-10}

Ans. **[3]**

Sol. $Ca(OH)_2 \rightleftharpoons \underset{s}{Ca^{+2}} + \underset{2s}{2OH^-}$

pH = 9 pOH = 5

$[OH^-] = 10^{-5} = 2s$

$s = \frac{10^{-5}}{2}$

$K_{sp} = (s)\,(OH^-)^2$

$= \frac{10^{-5}}{2} \times (10^{-5})^2$

$= \frac{1}{2} \times 10^{-15}$

$= 0.5 \times 10^{-15}$

Q.155 For an ideal solution, the correct option is -

(1) Δ_{mix} H = 0 at constant T and P

(2) Δ_{min} G = 0 at constant T and P

(3) Δ_{mix} S = 0 at constant T and P

(4) Δ_{mix} V ≠ 0 at constant T and P

Ans. **[1]**

Sol. Liquid solution

For ideal solution

$\Delta H_{mix} = 0$

$\Delta S_{mix} = \oplus$

$\Delta G_{mix} = \ominus$

Q.156 A gas at 350 K and 15 bar has molar volume 20 percent smaller than that for an ideal gas under the same conditions. The correct option about the gas and its compressibility factor (Z) is -

(1) Z < 1 and attractive forces are dominant

(2) Z < 1 and repulsive forces are dominant

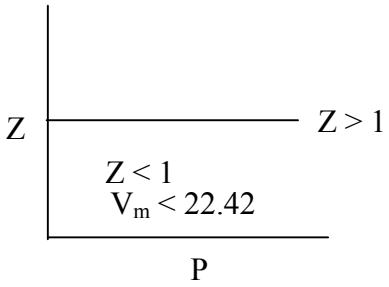
(3) Z > 1 and attractive forces are dominant

(4) Z > 1 and repulsive forces are dominant

Ans. **[1]**

Sol. $Z = \frac{pv}{\eta R_t}$ $Z = \frac{V_{real}}{rideal}$

$V_{real} > Vi_{deal}$



Z < 1 then intenvolealav forcen dominant

Z > 1 then repulsive forces dominate

Q.157 The correct order of the basic strength of methyl substituted amines in aqueous solution is -

(1) $(CH_3)_3N$. $(CH_3)_2NH > CH_3NH_2$

(2) $CH_3NH_2 > (CH_3)_2NH > (CH_3)_3N$

(3) $(CH_3)_2NH > CH_3NH_2 > (CH_3)_3N$

(4) $(CH_3)_3N > CH_3NH_2 > (CH_3)_2NH$

Ans. **[3]**

Sol. $(CH_3)_2$ NH > CH_3 NH_2 > $(CH_3)_3N$

In aqueous sol

Reayon → (i) Hychogen Bonding

(ii) Stenic factor

Q.158 For the second period elements the correct increasing order of first ionization enthalpy is -

(1) Li < B < Be < C < N < O < F < Ne

(2) Li < Be < B < C < O < N < F < Ne

(3) Li < Be < B < C < N < O < F < Ne

(4) Li < B < Be < C < O < N < F < Ne

Ans. **[4]**

Sol. Order of IE

I.E of Be > B

I.E of N > O

∴ Li < B ≤ Be < C < O ≤ N < F < F < < Ne

Q.159 Which mixture of the solution will lead to the formation of negatively charged colloidal [AgI] I^-

(1) 50 mL of 2 M $AgNO_3$ + 50 mL of 1.5 M KI (2) 50 mL of 0.1 M $Ag NO_3$ + 50 mL of 0.1 M KI

(3) 50 mL of 1 M $AgNO_3$ + 50 mL of 1.5 M KI (4) 50 mL of M $Ag NO_3$ + 50 mL of 2 M KI

Ans. **[3,4]**

Sol. $AgNO_3 + KI \rightarrow AgI + KNO_3$

for $[AgI]^{I-}$ colloidal

KI must be in excels

(1), (2) both correct

50 me $AgNO_3$ + 50 me

1.5 m

KI

50 ml $AgNO_3$ + 50 ml

2 m KI

Q.160 For the cell reaction

$2Fe^{3+}(aq) + 2I^-(aq) \rightarrow 2Fe^{2+}(aq) + I_2(aq)$

E^{Θ}_{cell} = 0.24 V at 298 K. The standard Gibbs energy ($\Delta_r G^{\Theta}$) of the cell reaction is :

[Given that Faraday constant F = 96500 C mol^{-1}]

(1) 46.32 kJ mol^{-1} (2) 23.16 kJ mol^{-1} (3) –46.32 kJ mol^{-1} (4) –23.16 kJ mol^{-1}

Ans. **[3]**

Sol. $\Delta G^{\circ} = -nF E^{\Theta}_{cell}$

$= -2(96500)(0.24)$

$= -46320$ J/mole

$= -\frac{46320}{1000}$

$= -46.32$ KJ/mole

Q.161 Which is the correct thermal stability order for H_2E (E = O, S, Se, Te and Po)?

(1) $H_2Po < H_2Te < H_2Se < H_2S < H_2O$ (2) $H_2Se < H_2Te < H_2Po < H_2O < H_2S$

(3) $H_2S < H_2O < H_2Se < H_2Te < H_2Po$ (4) $H_2O < H_2S < H_2Se < H_2Te < H_2Po$

Ans. **[1]**

Sol. As we move downwords stability of Hydrides decreases

$H_2O > H_2S > H_2Se > H_2Te > H_2Po$

Q.162 The number of moles of hydrogen molecules required to produce 20 moles of ammonia through Haber's process is :

(1) 30 (2) 40 (3) 10 (4) 20

Ans. **[1]**

Sol. $N_2 + 3H_2 \longrightarrow 2NH_3$

moles = ? 20 moles

$2 \times$ moles H_2 $= 3 \times$ moles NH_3

$2 \times x = 3 \times 20$

$x = 30$ moles

Q.163 Which of the following series of transitions in the spectrum of hydrogen atom falls in visible region?

(1) Paschen series (2) Brackett series (3) Lyman series (4) Balmer series

Ans. **[4]**

Sol. Visible region

Balmer series

Q.164 A compound is formed by cation C and anion A. The anions form hexagonal close packed (hcp) lattice and the cations occupy 75% of octahedral voids. The formula of the compound is :

(1) C_3A_4 (2) C_4A_3 (3) C_2A_3 (4) C_3A_2

Ans. **[1]**

Sol. Solid state

C	:	A
75% O.V.	:	(HCP)
$6 \times \frac{75}{100}$	:	6
$\frac{3}{4}$	:	1
3	:	4

C_3A_4

Q.165 The non-essential amino acid among the following is :

(1) alanine (2) lysine (3) valine (4) leucine

Ans. **[1]**

Sol. Non Essential amino acid $\rightarrow$ Alanine

Q.166 An alkene "A" on reaction with O_3 and Zn + H_2O gives propanone and ethanal in equimolar ratio. Addition of HCl to alkene "A" gives "B" as the major product. The structure of product "B" is :

(1) $H_3C-CH_2-\underset{\underset{Cl}{|}}{\overset{\overset{CH_3}{|}}{C}}-CH_3$

(2) $H_3C-\underset{\underset{Cl}{|}}{CH}-\underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{CH}}$

(3) $Cl-CH_2-CH_2-\underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{CH}}$

(4) $H_3C-CH_2-\underset{\underset{CH_3}{|}}{\overset{\overset{CH_2Cl}{|}}{CH}}-CH_3$

Ans. **[1]**

Sol.

$$CH_3-\underset{(A)}{\overset{\overset{CH_3}{|}}{C}}=CH-CH_3 \xrightarrow{O_3/Zn+H_2O} CH_3-\underset{\underset{CH_3}{|}}{C}=O + CH_3-CH=O$$

$\downarrow$ HCl

$$CH_3-\underset{\underset{Cl}{|}}{\overset{\overset{CH_3}{|}}{C}}-CH_2-CH_3 \quad (B)$$

Q.167 Which of the following species is not stable?

(1) $[Sn(OH)_6]^{2-}$ (2) $[SiCl_6]^{2-}$ (3) $[SiF_6]^{2-}$ (4) $[GeCl_6]^{2-}$

Ans. **[2]**

Sol. $SiCl_6^{-2}$ does not exist due to small size of Si and steric linderance of 6 Cl atoms

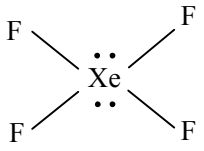
Q.168 Match the Xenon compounds in Column-I with its structure in column-II and assign the correct code :

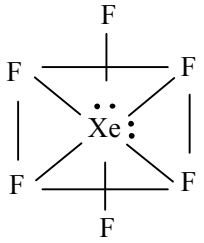
Column-I	Column-II
(a) XeF_4	(i) pyramidal
(b) XeF_6	(ii) square planar
(c) $XeOF_4$	(iii) distorted octahedral
(d) XeO_3	(iv) square pyramidal

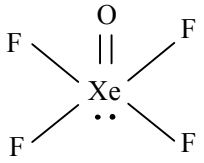
Code :

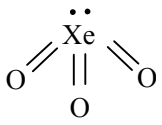
	(a)	(b)	(c)	(d)
(1)	(ii)	(iii)	(i)	(iv)
(2)	(iii)	(iv)	(i)	(ii)
(3)	(i)	(ii)	(iii)	(iv)
(4)	(ii)	(iii)	(iv)	(i)

Ans. **[4]**

Sol. XeF_4  Squre planar

XeF_6  Distorted or irregular octahedral

$XeOF_4$  Squre pyramidal

XeO_3  Pyramidal

Q.169 Among the following, the one that is not a green house gas is :

(1) ozone (2) sulphur dioxide (3) nitrous oxide (4) methane

Ans. **[2]**

Sol. Sulphurdioxide SO_2

Q.170 Which of the following reactions are disproportionation reaction?

(a) $2Cu^{+} \rightarrow Cu^{2} + Cu^{0}$

(b) $3MnO_4^{2+} + 4H^{+} \rightarrow 2MnO_4^{-} + MnO_2 + 2H_2O$

(c) $2KMnO_4 \xrightarrow{\Delta} K_2MnO_4 + MnO_2 + O_2$

(d) $2MnO_4^{-} + 3Mn^{2+} + 2H_2O \rightarrow 5MnO_2 + 4H^{\oplus}$

Select the correct option from the following :

(1) (a), (c) and (d) (2) (a) and (d) only (3) (a) and (b) only (4) (a), (b) and (c)

Ans. **[3]**

Sol. $\overset{+7}{K}Mn\overset{+6}{O_4} \longrightarrow K_2\overset{+6}{Mn}O_4 + \overset{+4}{Mn}O_4$

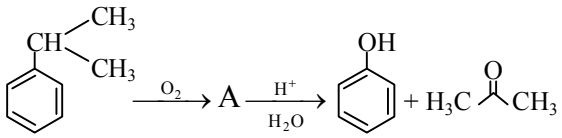
$Cu^{+1} \longrightarrow Cu^{+2} + Cu^{0}$

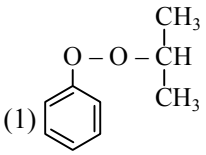
Disproportionate Rx^{n}

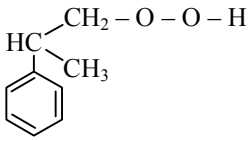
$\overset{+6}{Mn}O_4^{-2} \longrightarrow \overset{+7}{Mn}O_4^{-} + \overset{+4}{Mn}O_2$

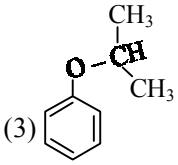
(a), (b) only

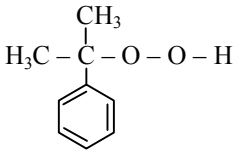
Q.171 The structure of intermediate A in the following reaction, is :



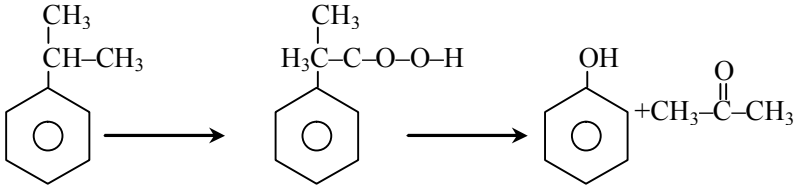
(1) 

(2) 

(3) 

(4) 

Ans. **[4]**

Sol. 

Q.172 The mixture that forms maximum boiling azeotrope is :

(1) Acetone + Carbon disulphide

(2) Heptane + Octane

(3) Water + Nitric acid

(4) Ethanol + Water

Ans. **[3]**

Sol. Liquid solution

$\Rightarrow$ Max. bpt. Azeotrope

$\Rightarrow$ Negative deviation

$H_2O + HNO_3$

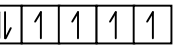
Q.173 What is the correct electronic configuration of the central atom in $K_4[Fe(CN)_6]$ based on crystal field theory?

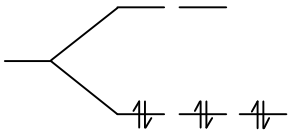
(1) $e^3t_2^3$ (2) $e^4t_2^2$ (3) $t_{2g}^4e_g^2$ (4) $t_{2g}^6e_g^0$

Ans. **[4]**

Sol. $k_4[Fe(CN)_6]$

has $Fe^{+2} = [Ar]\ 3d^6$

$= [Ar]$ 



$\therefore\ t_{2g}^6\ e_g^0$

Q.174 Conjugate base for Bronsted acids H_2O and HF are :

(1) OH^- and F^-, respectively (2) H_3O^+ and H_2F^+, respectively

(3) OH^- and H_2F^+, respectively (4) H_3O^+ and F^-, respectively

Ans. **[1]**

Sol. Bronsted Acids or H_2O & HF

Base $\xleftarrow{H^+}$

$\downarrow$

Bronsted Acid

H_3O^+, H_2F^+

Bronsted Base

$\xrightarrow{-H^+}$

OH^-, F^-

Q.175 Which will make basic buffer?

(1) 100 mL of 0.1 M HCl + 200 mL of 0.1 M NH_4OH

(2) 100 mL of 0.1 M HCl + 100 mL of 0.1 M NHOH

(3) 50 mL of 0.1 M NaOH + 25 mL of 0.1 M CH_3COOH

(4) 100 mL of 0.1 M CH_3COOH + 100 mL of 0.1 M NaOH

Ans. **[1]**

Sol. Weak Acid > Strong Base

Weak Base > Strong Acid

0.1 M 200 Ml NH_4OH > 0.1 M 100 Ml HCl

Q.176 4d, 5p, 5f and 6p orbitals are arranged in the order of decreasing energy. The correct option is :

(1) 6p > 5f > 4d > 5p (2) 5f > 6p > 4d > 5p (3) 5f > 6p > 5p > 4d (4) 6p > 5f > 5p > 4d

Ans. **[3]**

Sol. 4d, 5p, 5f, 6p

$n+\ell$ = 4+2, 5+1, 5+3, 6+1

6, 6, 8, 7

5f > 6p > 5p > 4d

Q.177 Among the following, the narrow spectrum antibiotic is :

(1) amoxycillin (2) chloramphenicol

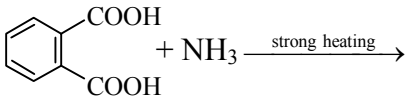
(3) penicillin G (4) ampicillin

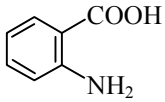
Ans. **[3]**

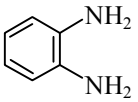
Sol. Penicillin – G

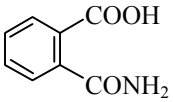
Narrow Spectrum antibiotics

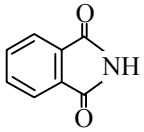
Q.178 The major product of the following reaction is :



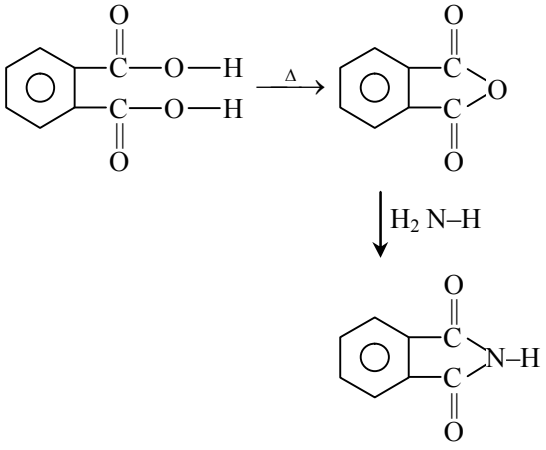
(1) 

(2) 

(3) 

(4) 

Ans. **[4]**

Sol. 

phthalamide

Q.179 The method used to remove temporary hardness of water is :

(1) Ion-exchange method (2) Synthetic resins method

(3) Calgon's method (4) clark's method

Ans. **[4]**

Sol. Clark's method is used to remove temporary hardness

$Ca(HCO_3)_2 + Ca^{+2}$ or $Mg^{+2} \longrightarrow CaCO_3$ or $MgCO_3 + H_2O$

Q.180 Which one is malachite from the following?

(1) Fe_3O_4 (2) $CuCO_3 \cdot Cu(OH)_2$ (3) $CuFeS_2$ (4) $Cu(OH)_2$

Ans. **[2]**

Sol. Malachite = $CuCO_3 \cdot Cu(OH)_2$