41 YEARS OF EXCELLENCE

NARAYANA EDUCATIONAL INSTITUTIONS

NARAYANA 100 PERCENTILE JEE MAIN - 2020 (JAN)

NARAYANA'S SENSATIONAL SUCCESS ACROSS INDIA

TOTAL / MATHS
PARTH DWIVEDI
200310166791

PHYSICS
D. SANDEEP VARMA
200310233232

MATHS / PHYSICS
M. VIRANCHI
200310512964

MATHS / PHYSICS
M. LIKHITH REDDY
200310574091

MATHS / PHYSICS
RAGHAVENDRA CHOWDARY
200310238062

PHYSICS
MD. RIZAN FAROOQUI
200310153345

and many more...

ADMISSIONS OPEN (2020-21)

OUR REGULAR CLASSROOM PROGRAMME

One Year Classroom Program
JEE/NEET-2021
(for students moving from XI to XII)

Two Year Classroom Program
JEE/NEET-2022
(for students moving from X to XI)

Three Year Integrated Classroom Program
JEE/NEET-2023
(for students moving from IX to X)

Four Year Integrated Classroom Program
JEE/NEET-2024
(for students moving from VIII to IX)

FOUNDATION PROGRAMMS
For NTSE, NSEJS, JSTSE, Olympiads & School/Board Exams
(for students moving to Class VI, VII, VIII, IX & X)

APEX BATCH
Two years school Integrated Classroom Program - 2022
For JEE (Main & Advanced) / NEET [For XI Styding Students]
Course Feature • Complete Coverage of CBSE • Regular Classes • Weekly Test & Result Analysis • Lab facility • Motivation & counseling • Competitive Exam Prep. • Ample time for self study

Online Classes for IIT/NEET/Foundation/Olympiads

- Access Recording of Past Classes on n-Learn App
- Online Parent Teacher Meeting
- Personalized Extra Classes & Live Doubt Solving
- Hybrid/Customized Class room model
- Video Solution of Weekly/Fortnightly Test
- Printed Study Material will be sent by us
- n-Learn App
- Couselling/Motivational sessions
- Affordable Fee
- Doubt Classes / Practice Classes
- Provision to Convert from online to regular classroom programme
- Once Classes resume by just paying nominal fee

Online Test

- Micro & Macro Analysis
- Relative performance (All India Ranking)
- Question wise Analysis
- Unlimited Practice Test
- Grand Test

NARAYANA Digital Classes
STUDY ONLINE FROM HOME

For Class 7th to 12th +

TOLL FREE : 1800 102 3344 | visit us at : www.narayanagroup.com

SRAMAYEVA JAYATHE

THE NARAYANA GROUP

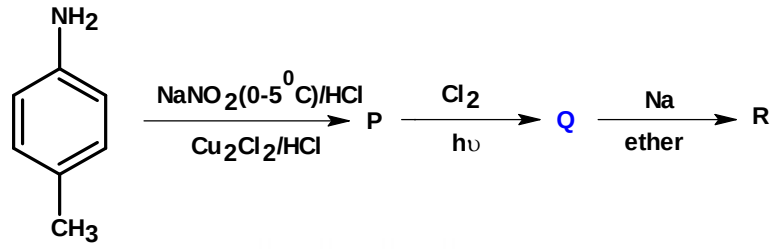
JEE-MAIN-2020

SEPTEMBER ATTEMPT

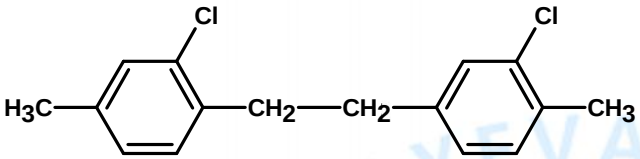
04.09.20_SHIFT-II

CHEMISTRY

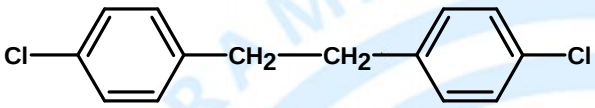
1. Identify end product of following reaction sequence?



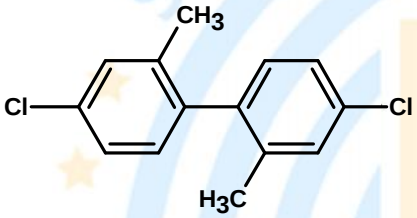
1)



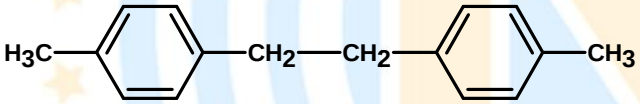
2)



3)

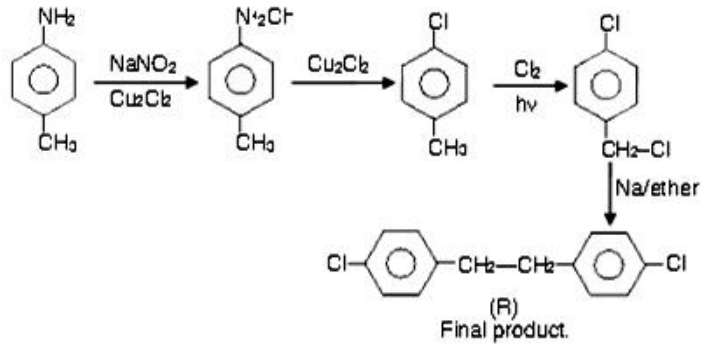


4)



Ans: 2

Sol:



2. During roasting and calcination emitted gases produce which of the following effects.

1) Photochemical smog, acid rain

2) Acid rain, global warming

3) Photochemical smog, global warming

4) Acid Rain, ozone deplition

Ans: 2

Sol: NCERT

3. Synthetic drug (seldane) Terfenadine work Histamine.

1) Increase stimulation of Histamine

2) Drug bind to the receptor site and inhibit natural function of histamine.

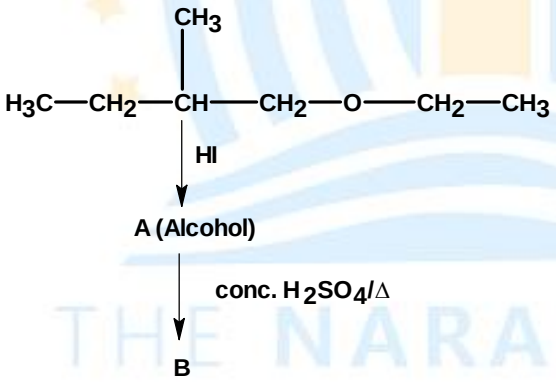
3) Increase reactivity of Histamine

4) This drugs mimic the natural messenger by switching on the receptor

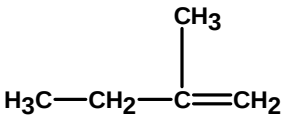
Ans: 2

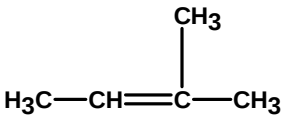
Sol: Seldane act as antihistamines and interfere with the natural action of histamine by competing with histamine for binding sites of receptor.

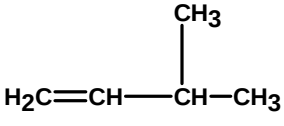
4.

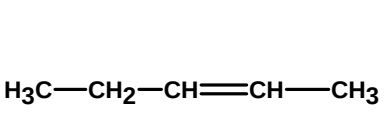


Find out major product of following reaction sequence

1) 

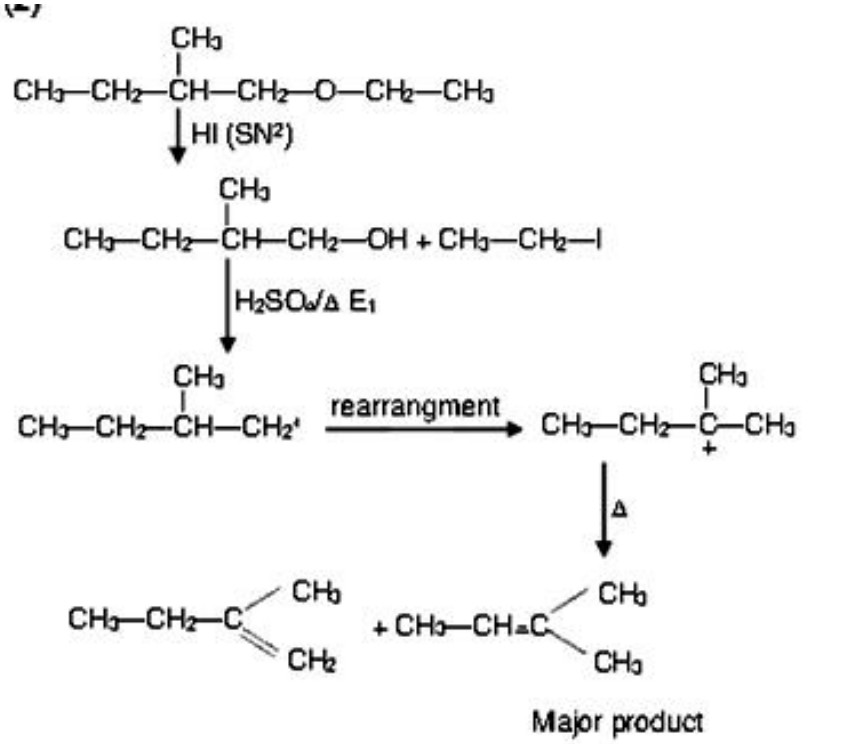
2) 

3) 

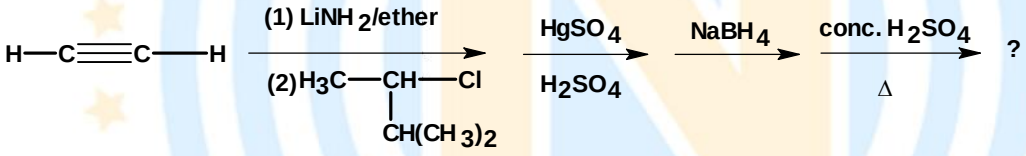
4) 

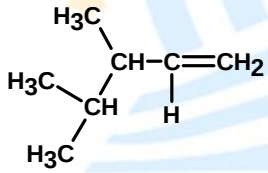
Ans: 2

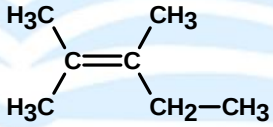
Sol:

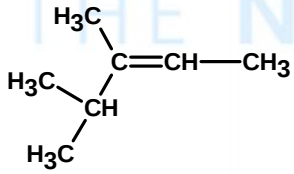


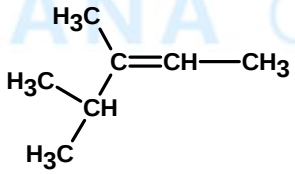
5. Find product of following reaction sequence?



1) 

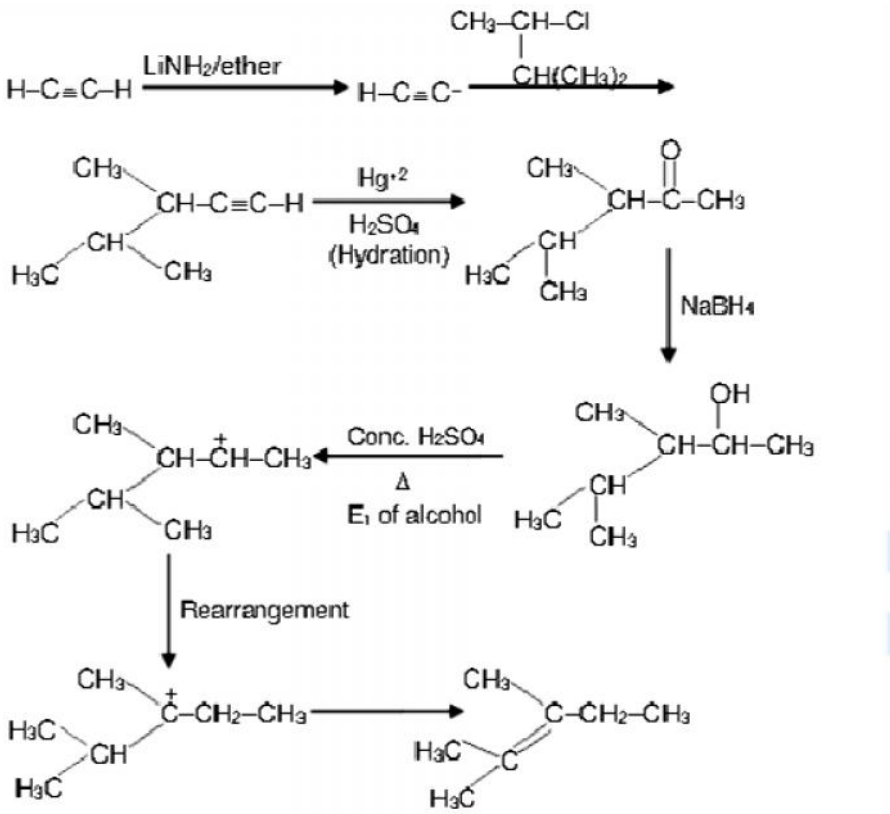
2) 

3) 

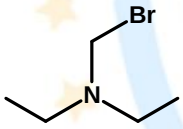
4) 

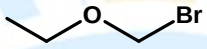
Ans: 2

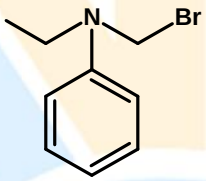
Sol:

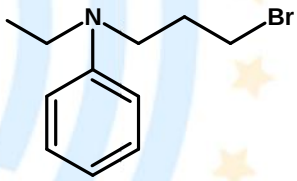


6. Which one is most reactive towards aq. $AgNO_3$?

1) 

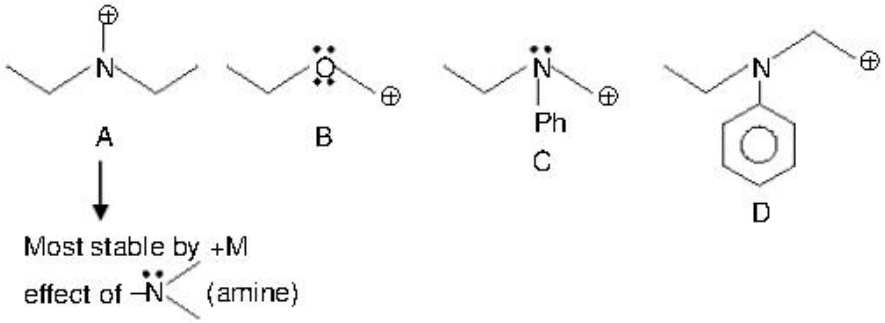
2) 

3) 

4) 

Ans: 1

Sol: Given reaction is an examples of SN^1 reaction. Which depend upon stability of carbocation.



7. In colloidal solution of blue ink following reagent are mixed H_2O, Egg albumin, CH_3COOH and HCl then which of the above reagent ensure the stability of Blue ink.

1) H_2O 2) Egg albumin 3) CH_3COOH 4) HCl

Ans: 2

Sol: Blue ink is a colloidal so, so it can be stabilised by material like natural gum or Egg albumin.

8. Which of the following complex show maximum paramagnetism?

[PPh_3 = triphenyl phosphine, ox = oxalato, gly= glycinato]

1) $\left[Co(ox)_2(NH_3)_2\right]^-$ 2) $\left[Fe(en)(bpy)(NH_3)_2\right]^{2+}$

3) $\left[Pd(gly)(PPh_3)_2\right]^+$ 4) $\left[Ti(H_2O)_6\right]^{3+}$

Ans: 4

Sol:

Complex	Electronic configuration	No. of unpaired electron
1) $\left[Co(OX_2)(NH_3)_2\right]^-$	$Co^{3+} = 3d^6 \Rightarrow t_{2g^6}, e_{g^0}$	0
2) $\left[Fe(en)(bipy)(NH_3)_2\right]^{2+}$	$Fe^{2+} = 3d^6 \Rightarrow t_{2g^6}, e_{g^0}$	0
3) $\left[Pd(gly)(PPh_3)_2\right]^+$	$Pd^{2+} = 4d^8$	0
4) $\left[Ti(H_2O)_6\right]^{3+}$	$Ti^{3+} = 3d^1 \Rightarrow t_{2g^1}, e_{g^0}$	1

9. Identify the complex in which has only one d orbital is used in the hybridisation

1) $\left[Ni(CN)_4\right]^{2-}$ 2) $\left[Fe(CN)_6\right]^{3-}$ 3) $\left[Co(en)_3\right]^{3+}$ 4) $\left[FeF_6\right]^{3-}$

Ans: 1

Sol:

Complex	EC	Hybridisation
1) $\left[Ni(CN)_4\right]^{2-}$	$Ni^{2+} = 3d^8$	dsp^2
2) $\left[Fe(CN)_6\right]^{3-}$	$Fe^{3+} = 3d^5 \Rightarrow t_{2g^{2,2,1}}, e_g^{0,0}$	d^2sp^3
3) $\left[Co(en)_3\right]^{3+}$	$Co^{3+} = 3d^6 \Rightarrow t_{2g^{2,2,2}}, e_g^{0,0}$	d^2sp^3
4) $\left[FeF_6\right]^{3-}$	$Fe^{3+} = 3d^5 \Rightarrow t_{2g^{1,1,1}}, e_g^{1,1}$	sp^3d^2

10. In hydrogen spectrum shortest wave length for Lyman series line is λ, then find longest wave length of Balmer series line in He^+ ion spectrum.

1) λ 2) $\frac{9}{5}\lambda$ 3) $\frac{5}{9}\lambda$ 4) $\frac{4}{9}\lambda$

Ans: 2

Sol: for hydrogen atom:

For Lyman series $n_1 = 1$ & $n_2 = \infty$

$$\frac{1}{\lambda_H} = R_H\left[\frac{1}{1} - \frac{1}{\infty}\right] \text{ so, } \lambda = \frac{1}{R_H}$$

For He^+ ion

Balmer series $n_1 = 2$ & $n_2 = 3$

$$\frac{1}{\lambda_{He}} = R_H \times 4 \times \frac{5}{36}$$

$$\frac{1}{\lambda_{He}} = \frac{5}{9}R_H = \left(\frac{5}{9}\right)\frac{1}{\lambda}$$

$$\left|\lambda_{He}\right| = \frac{9}{5}\lambda$$

11. Which of the following process is not endothermic?

1) $H_{(g)} + e^- \longrightarrow H^-_{(g)}$ 2) $Ar_{(g)} + e^- \longrightarrow Ar^-_{(g)}$

3) $O^-_{(g)} + e^- \longrightarrow O^{2-}_{(g)}$ 4) $Na_{(g)} \longrightarrow Na^+_{(g)} + e^-$

Ans: 1

Sol: $H_{(g)} + e^- \xrightarrow{\text{extermic}} H^-_{(g)}$ $\Delta H_{eg} = -72\,KJ/mol$

$O^-_{(g)} + e^- \xrightarrow{\text{endothermic}} O^{2-}_{(g)}$ $\Delta H_{eg} = +744\,KJ/mol$

$Ar_{(g)} + e^- \xrightarrow{\text{endothermic}} Ar^-_{(g)}$ $\Delta H_{eg} = +96KJ/mol$

$Na_{(g)} \xrightarrow{\text{endothermic}} Na^+_{(g)} + e^-$ $IE = 495.8\,KJ/mol$

12. Calculate CFSE for complex $\left[Co\left(H_2O\right)_3F_3\right]$ [Given $\Delta_0 < P$]

1) $-0.8\Delta_0 + 2P$ 2) $-0.4\Delta_0 + P$ 3) $-0.8\Delta_0$ 4) $-0.4\Delta_0$

Ans: 4

Sol: $\left[Co\left(H_2O\right)_3F_3\right]$ $Co^{3+} = 3d^6 4s^0 \Rightarrow t_{2g^{2,1,1},e_g^{1,1,}}$

$CFSE = \left[-0.4nt_{2g} + 0.6n_{eg}\right]\Delta_0 + n\left(P\right)$

$= \left[-0.4\times 4 + 0.6\times 2\right]\Delta_0 + 0$

$= -0.4\Delta_0$

13. 5 mole of an ideal gas of volume V is expanded against vacuum to make its volume 2 times, then work done by the gas is :

1) $-RT\left(V_2 - V_1\right)$ 2) $-RT\ell n\left(\frac{V_2}{V_1}\right)$ 3) zero 4) $C_V\left[T_2 - T_1\right]$

Ans: 3

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

In expansion against vacuum $P_{ext} = 0$

So work done is zero.

14. 100 ml solution of each 0.1 M AuCl and 0.1 M AgCl is electrolysed by passing 1 amp current for 15 min, then which of the following will be deposited?

[Given $Au^+(aq) + e^- \longrightarrow Au \;\; E^0 = 1.69\,V$]

$Au^+(aq) + e^- \longrightarrow Ag \;\; E^0 = 0.80\,V$]

1) Only Au 2) Only Ag

3) Both Au and Ag 4) None of Au and Ag

Ans: 1

Sol: $\text{Charge (q)} = \frac{it}{96500}F = \frac{1\times15\times60}{96500} = \frac{900}{96500} = \frac{9}{965}F = 0.0093F$

No. of moles of $Au^+ = 0.01$ & No. of moles of $Ag^+ = 0.01$

Species with higher value of SRP will get deposited first at cathode.

(i) $\underset{0.01}{Au^+(aqs)} + e^- \longrightarrow \underset{0.0093\,mole}{Au(s)}$

So only Au will get deposited.

15. An alkaline earth metal, sulphate is soluble in water while its hydroxide is not soluble in water and its oxide does not form rock salt structure, then metal is :

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

Ans: 1

Sol: $BeSO_4$ soluble in water

$Be(OH)_2$ insoluble in water

Structure of BeO is Hexagonal Wurtzite.

16. In which of the following reaction, hybridisation of underline atom gets changed ?

1) $\underline{Xe}F_4 + SbF_5 \longrightarrow$ 2) $H_3\underline{P}O_2 \xrightarrow{\text{dispropotionation}}$

3) $H_2\underline{S}O_4 + NaCl \longrightarrow$ 4) $\underline{N}H_3 + BF_3 \longrightarrow$

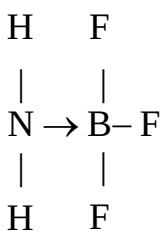
Ans: 1

Sol: 1) $\underset{sp^3d^2}{XeF_4} + SbF_5 \longrightarrow \left[\underset{sp^3d}{XeF_3}\right]^+ \left[SbF_6\right]^-$

2) $\underset{sp^3}{H_3PO_2} \xrightarrow{\text{dispropotionation}} \underset{sp^3}{H_3PO_4} + PH_3$

3) $\underset{sp^3}{H_2SO_4} + 2NaCl \longrightarrow \underset{sp^3}{Na_2SO_4} + 2HCl$

4) $\underset{sp^3}{NH_3} + BF_3 \longrightarrow$



17. Given

(i) $A \rightleftharpoons B + C \qquad K_{eq}(1)$

(ii) $B + C \rightleftharpoons P \qquad K_{eq}(2)$

Then K_{eq} for reaction $A \rightleftharpoons P$ is

1) $K_{eq}(1).K_{eq}(2)$ 2) $\frac{K_{eq}(1)}{K_{eq}(2)}$ 3) $K_{eq}(1) + K_{eq}(2)$ 4) $K_{eq}(1) - K_{eq}(2)$

Ans: 1

Sol: On adding reaction 1st and reaction 2nd we get.

$A \rightleftharpoons P \quad K_{eq} = K_{eq}(1).K_{eq}(2)$

18. Osmotic pressure of NaCl solution is 0.1 atm and Glucose solution is 0.2 atm. If 1 L of NaCl solution and 2 L of Glucose solution is mixed at same temperature, then osmotic pressure of resulting solution is 'X' $\times 10^{-3}$ atm, then value of 'X' in nearest integer is

Ans: 166.66 or 166.67

Sol: $\prod = iCRT = i\left(\frac{n}{N}\right)RT$

$$\prod_{final} = \frac{(\pi_1 V_1) + (\pi_2 V_2)}{V_1 + V_2}$$

$$\prod_{final} = \frac{(0.1 \times 1) + (0.2 \times 2)}{3}$$

$$= \frac{(0.1 + 0.4)}{3} = \frac{0.5}{3} = \frac{500}{3} \times 10^{-3} \text{atm}$$

So X = 166.66 or 166.67

19. If temperature changed from $27°C$ to $42°C$ then no. of molecule having energy greater than threshold energy become five times, then find activation energy (Ea) of reaction (in kJ)

[Given ln 5 = 1.60 & R = 8.314 $\frac{J}{\text{Mole K}}$]

Ans: 88.80

Sol: $k = Ae^{-\frac{Ea}{RT}}$

$$\ln\left(\frac{K_2}{K_1}\right) = \frac{Ea}{R}\left[\frac{1}{T_1} - \frac{1}{T_2}\right]$$

$$\ln(5) = \frac{Ea}{8.314}\left[\frac{1}{300} - \frac{1}{315}\right]$$

$$1.6094 = \frac{Ea}{8.314}\left[\frac{15}{300 \times 315}\right]$$

Ea= 84.30 kJ

20. In 100 mL, 0.1 N $Na_2CO_3.xH_2O$ solution. Mass of solute is 1.43 gram, then value of X is :

Ans: 10.00

Sol: Equivalent of solute $= 0.1 \times 0.1$

Mole of solute $\left(Na_2CO_3.xH_2O\right) = \left[0.1 \times 0.1\right]\frac{1}{2}$

Mass of $Na_2CO_3.xH_2O = \left[0.1 \times 0.1\right]\frac{1}{2} \times \left[106 + 18x\right] = 1.43$

$\Rightarrow 106 + 18x = 286$

x = 10

21. For the following redox reactions

(i) $2Fe^{2+} + H_2O_2 + 2H^+ \longrightarrow xA + yB$

(ii) $2MnO_4^- + 6H^+ + 5H_2O_2 \longrightarrow x'A' + y'B' + z'C'$

Find the sum of coefficient $\left(x + y + x' + y' + z'\right)$

Ans: 19.00

Sol: (i) $2Fe^{2+} + H_2O_2 + 2H^+ \longrightarrow 2Fe^{3+} + 2H_2O$

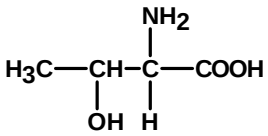
(ii) $2MnO_4^- + 5H_2O_2 + 6H^+ \longrightarrow 2Mn^{2+} + 5O_2 + 8H_2O$

So sum of $(x + y + x' + y' + z')$ = 2 + 2 + 2 + 5 + 8 = 19

22. How many chiral centres are present in Threonine.

Ans: 2

Sol:



Threonine have two chiral carbon atom.