

# NARAYANA'S SENSATIONAL SUCCESS ACROSS INDIA

**7** Students Secured **100 Percentile**  
in All India JEE Main-2020

BELOW 10  
**21**  
RANKS  
All Cat

BELOW 100  
**113**  
RANKS  
All Cat



**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 PROGRAMMES**  
**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 & Advance / NEET (for XI Studying Students)  
**Course Feature** - Complete Coverage of CBSE - Regular Classes - Weekly Test & Regular 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 Classroom model
- Video Solution of Weekly/Fortnightly Test
- Printed Study Material will be sent by us
- n-Learn App
- Counselling 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**  
**7<sup>th</sup> to 12<sup>th</sup> +**





**JEE-MAIN-2021**

**MARCH ATTEMPT**

**18.03.21\_SHIFT - I**

**CHEMISTRY**

**JEE(MAIN) 2021 (18 MARCH ATTEMPT) SHIFT-1**  
**CHEMISTRY**

1. Non reducing sugar which gives two reducing sugar is

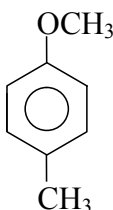
- (1) Glucose (2) Fructose (3) Galactose (4) Sucrose

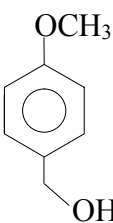
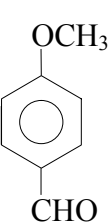
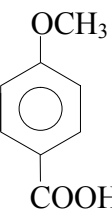
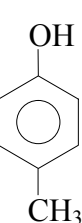
Ans. (4)

Sol. Sucrose  $\xrightarrow{\text{Hydrolysis}}$  Glucose + Fructose

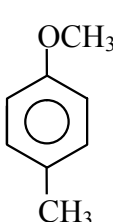
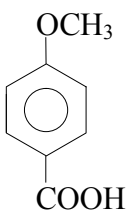
Sucrose is disaccharide and it gives two monosaccharides on hydrolysis.

Sucrose is non-reducing sugar but sugars obtained by hydrolysis are reducing sugars.

2.   $\xrightarrow{\text{KMnO}_4}$  product is :

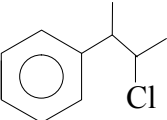
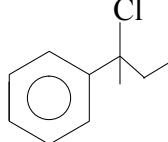
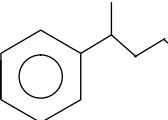
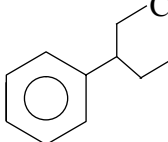
- (1)  (2)  (3)  (4) 

Ans. (3)

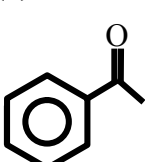
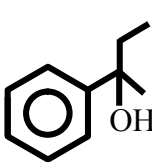
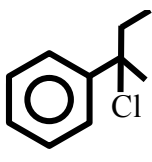
Sol.   $\xrightarrow{\text{KMnO}_4}$    
Oxidation of alkyl side chain of benzene into carboxylic group

3.  $\text{C}_8\text{H}_8\text{O} + \text{CH}_3\text{CH}_2\text{MgBr} \longrightarrow (\text{A}) \xrightarrow[\text{Reagent}]{\text{Lucas}} (\text{B})$  Instant turbidity

Identify product (B).

- (1)  (2)  (3)  (4) 

Ans. (2)

Sol.   $\xrightarrow[\text{(ii) H}_2\text{O}]{\text{(i) C}_2\text{H}_5\text{MgBr}}$    $\xrightarrow[\text{HCl, ZnCl}_2]{\text{Lucas reagent}}$   Instant turbidity

4. Match the following :

**Column-I**

(A) Anti fertility

(B) Antacid

(C) Tranquilizer

(D) Artificial sweetener

**Column-II**

(i) Alitame

(ii) Valium

(iii) Cimetidine

(iv) Novestrol

(1) (A) → (iv) ; (B) → (iii) ; (C) → (ii) ; (D) → (i)

(2) (A) → (i) ; (B) → (ii) ; (C) → (iii) ; (D) → (iv)

(3) (A) → (ii) ; (B) → (iv) ; (C) → (i) ; (D) → (iii)

(4) (A) → (iv) ; (B) → (iii) ; (C) → (i) ; (D) → (ii)

Ans. (1)

5. Which of the following statements is/are true for methane?

Statement-1 : Methane causes both, photochemical smog and global warming.

Statement-2 : Methane is found in paddy fields.

Statement-3 : It is a stronger global warming gas than CO<sub>2</sub>.

Statement-4 : Methane is a part of reducing smog.

(1) S1, S2, S3

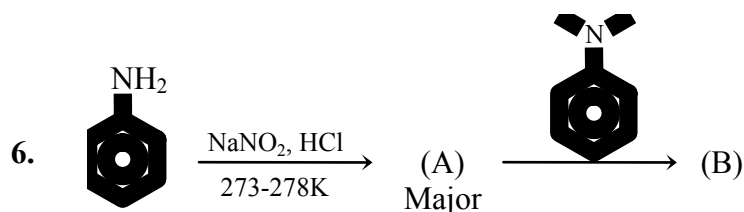
(2) S2, S3

(3) S1, S2, S4

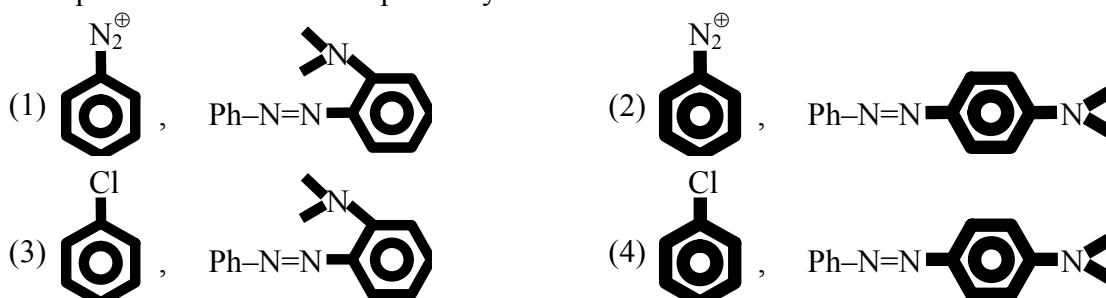
(4) S1, S2

Ans. (1)

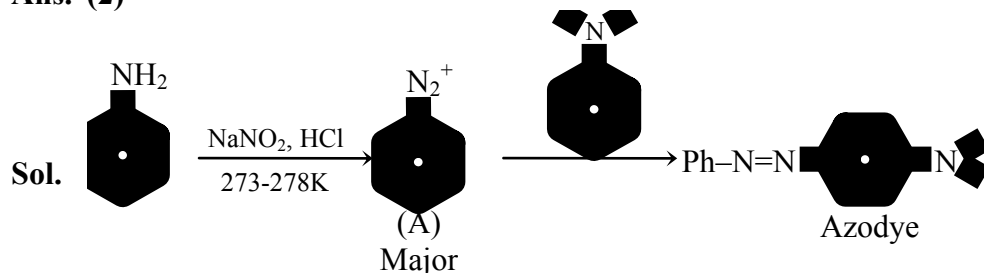
Sol. Methane is a part of oxidising smog not reducing smog.



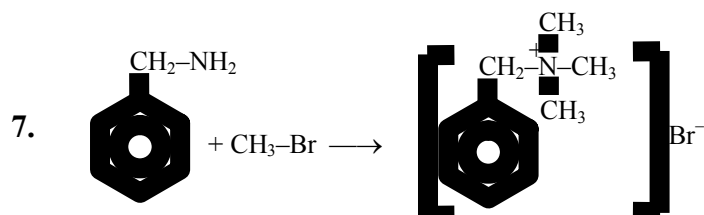
Find product A and B are respectively?



Ans. (2)





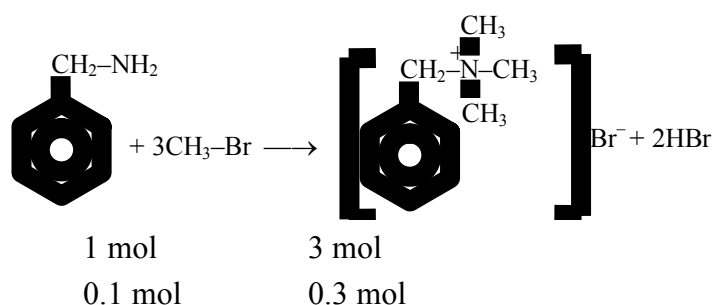


Moles of Methylbromide required to form 23 gm Trimethylbenzyl ammonium bromide is  $n \times 10^{-1}$ . Calculate "n"

**Ans. (3)**

**Sol.** Mole of trimethylbenzyl ammonium bromide =  $\frac{23}{230}$   
 $= 0.1$

Mole of  $\text{CH}_3\text{Br}$  required =  $3 \times 0.1 = 0.3 \text{ mol}$



8.  $\text{C}_3\text{H}_6\text{O}$  can show

- |                        |                                     |
|------------------------|-------------------------------------|
| (1) Chain isomers      | (2) Position isomers                |
| (3) Functional isomers | (4) Metamers and positional isomers |

**Ans. (3)**

**Sol.** Acetone and propanal are functional isomers having same molecular formula  $\text{C}_3\text{H}_6\text{O}$ .

9. Match the following

**Column (I)**

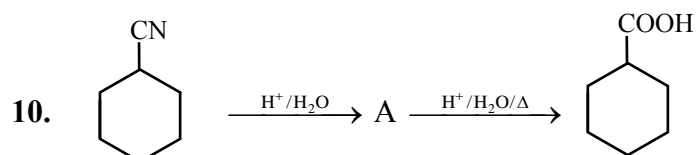
- (A) Alc. KOH  
 (B)  $\text{Pd}/\text{BaSO}_4$   
 (C) BHC  
 (D) Polyacetylene

**Column (II)**

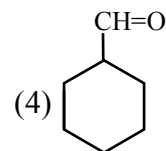
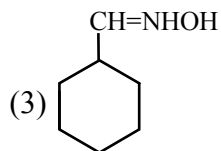
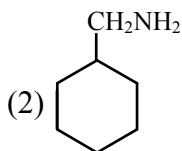
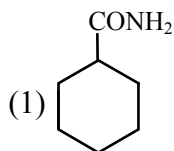
- (I) Electrode formation  
 (II) Lindlar  
 (III)  $\beta$ -Elimination  
 (IV) Addition

- (1)  $\text{A} \rightarrow \text{II}$  ;  $\text{B} \rightarrow \text{III}$  ;  $\text{C} \rightarrow \text{IV}$  ;  $\text{D} \rightarrow \text{I}$   
 (2)  $\text{A} \rightarrow \text{III}$  ;  $\text{B} \rightarrow \text{II}$  ;  $\text{C} \rightarrow \text{I}$  ;  $\text{D} \rightarrow \text{IV}$   
 (3)  $\text{A} \rightarrow \text{III}$  ;  $\text{B} \rightarrow \text{II}$  ;  $\text{C} \rightarrow \text{IV}$  ;  $\text{D} \rightarrow \text{I}$   
 (4)  $\text{A} \rightarrow \text{I}$  ;  $\text{B} \rightarrow \text{III}$  ;  $\text{C} \rightarrow \text{II}$  ;  $\text{D} \rightarrow \text{IV}$

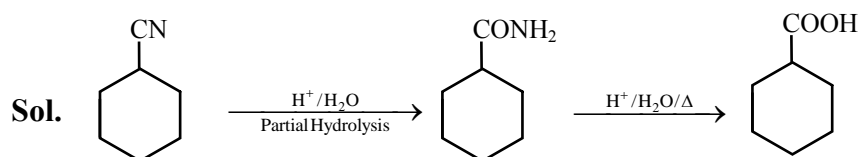
**Ans. (3)**



Compound A is :



Ans. (1)



11. Chemical used to decrease melting point of Alumina is :

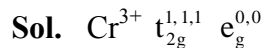
- (1) Bauxite      (2) Cryolite      (3) Calamine      (4) Kaolinite

Ans. (2)

Sol. Fact

12. Number of unpaired electrons in  $K_3[Cr(ox)_3]$  is :

Ans. (3)



So number of unpaired electron = 3

13. A diatomic compound AX has bond order 2.5 Both A and X are elements of 2<sup>nd</sup> period of periodic table. Total number of electrons in 1 molecule of AX is-

Ans. (15)

Sol. Species is NO

Total number of electron = 7 + 8 = 15

14. If  $Na^+$  has ionic radii 1.02 Å, ionic radii of  $Mg^{2+}$  &  $Al^{3+}$  are respectively :

- (1) 0.72 Å, 0.66 Å      (2) 1.05 Å, 0.99 Å  
(3)      (4)

Ans. (1)



15. pH of buffer solution of  $\text{CH}_3\text{COOH}$  and  $\text{CH}_3\text{COONa}$  is 5.74. Concentration of  $\text{CH}_3\text{COOH} = 1\text{M}$ . Find concentration of  $\text{CH}_3\text{COONa}$  in solution.

Given  $\text{p}K_a$  of  $\text{CH}_3\text{COOH} = 4.74$ .

**Ans. (10)**

**Sol.**  $\text{pH} = \text{p}K_a + \log_{10} \frac{[\text{CH}_3\text{COONa}]}{[\text{CH}_3\text{COOH}]}$

$$5.74 = 4.74 + \log_{10} \frac{[\text{CH}_3\text{COONa}]}{1}$$

$$\therefore [\text{CH}_3\text{COONa}] = 10\text{M}$$

16. Match the column

**Column – I**

**Column–II**

(A)  $\text{Ca}(\text{OCl})_2$

(P) Bleach

(B)  $\text{CaO}$

(Q) Antacid

(C)  $\text{CaCO}_3$

(R) Plaster of paris

(D)  $\text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$

(S) Cement

(1)  $\text{A} \rightarrow \text{P}$ ,  $\text{B} \rightarrow \text{S}$ ,  $\text{C} \rightarrow \text{Q}$ ,  $\text{D} \rightarrow \text{R}$

(2)  $\text{A} \rightarrow \text{P}$ ,  $\text{B} \rightarrow \text{Q}$ ,  $\text{C} \rightarrow \text{S}$ ,  $\text{D} \rightarrow \text{R}$

(3)  $\text{A} \rightarrow \text{P}$ ,  $\text{B} \rightarrow \text{S}$ ,  $\text{C} \rightarrow \text{R}$ ,  $\text{D} \rightarrow \text{Q}$

(4)  $\text{A} \rightarrow \text{S}$ ,  $\text{B} \rightarrow \text{Q}$ ,  $\text{C} \rightarrow \text{R}$ ,  $\text{D} \rightarrow \text{P}$

**Ans. (1)**

17. Which subshell has 2 radial nodes & no angular node-

(1) 3s

(2) 2s

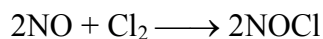
(3) 2p

(4) 3p

**Ans. (1)**

<b>Sol.</b> Subshell	Radial node	Angular node
3s	2	0
2s	1	0
2p	0	1
3p	1	1

18. Find overall order of given reaction using following experimental data



Exp.	[NO]	[Cl <sub>2</sub> ]	Initial rate
1.	0.1	0.1	0.18
2.	0.1	0.2	0.35
3.	0.2	0.2	1.4

**Ans. (3)**

**Sol.**  $\frac{0.18}{0.35} = \frac{K[\text{NO}]^\alpha[\text{Cl}_2]^\beta}{K[\text{NO}]^\alpha[\text{Cl}_2]^\beta}$

$$\frac{0.18}{0.35} = \frac{[0.1]^\alpha[0.1]^\beta}{[0.1]^\alpha[0.2]^\beta}$$

$$\beta = 1$$

$$\frac{0.35}{1.4} = \frac{K[0.1]^\alpha[0.2]^\beta}{K[0.1]^\alpha[0.2]^\beta}$$

$$\alpha = 2$$

$$\text{Rate} = K[\text{NO}]^1[\text{Cl}_2]^2$$

$$\text{Overall order} = 3$$

19. 2 Molal aqueous solution of weak acid freezes at  $-3.885^\circ\text{C}$ .  $K_f$  of water =  $1.85 \text{ K m}^{-1}$ . If degree of dissociation of acid is  $x \times 10^{-2}$ . Determine x.

**Ans. (5)**

**Sol.**  $\Delta T_f = 3.885$ ,  $K_f = 1.85 \text{ K m}^{-1}$

$$i = 1 + \alpha, m = 2$$

Now,

$$\Delta T_f = i \cdot K_f \cdot m$$

$$3.885 = (1 + \alpha) \times 1.85 \times 2$$

$$\alpha = 0.05 = 5 \times 10^{-2}$$

$$\Rightarrow x = 5$$

20. Match the following

**Column - I**

- (A) Anticancer Drug  
(B) Chlorophyll  
(C) Vitamin B<sub>12</sub>  
(D) Grubbs reagent

**Column - II**

- (I) Ru  
(II) Co  
(III) Mg  
(IV) Pt

(1) A  $\rightarrow$  IV ; B  $\rightarrow$  III ; C  $\rightarrow$  II ; D  $\rightarrow$  I

(3) A  $\rightarrow$  III ; B  $\rightarrow$  IV ; C  $\rightarrow$  II ; D  $\rightarrow$  I

(2) A  $\rightarrow$  I ; B  $\rightarrow$  II ; C  $\rightarrow$  III ; D  $\rightarrow$  IV

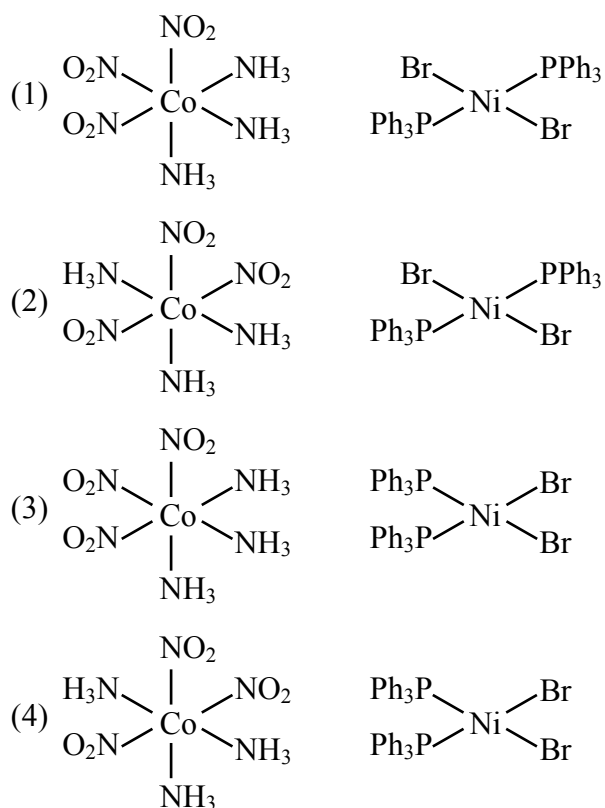
(4) A  $\rightarrow$  I ; B  $\rightarrow$  III ; C  $\rightarrow$  II ; D  $\rightarrow$  IV

**Ans. (1)**



**Sol.**  $\Rightarrow$  Cis-platin  $[\text{Pt}(\text{NH}_3)_2\text{Cl}_2]$  used in treatment of cancer  
 $\Rightarrow$  Chlorophyll is complex of Mg  
 $\Rightarrow$  Vitamin  $\text{B}_{12}$  is a complex of Co  
 $\Rightarrow$  Grubb's catalyst are a series of catalysts containing Ruthenium

**21.** What is the structure of trans isomer of  $[\text{NiBr}_2(\text{PPh}_3)_2]$  & meridional isomer of  $[\text{Co}(\text{NH}_3)_3(\text{NO}_2)_3]$ ?

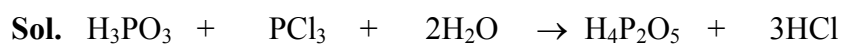


**Ans. (2)**

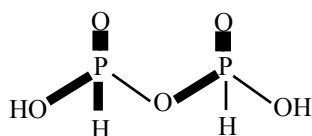
**22.** Phosphoric acid react with  $\text{PCl}_3$  to give A. How many ionisable hydrogen are there in A?

- (1) 2                                      (2) 0                                      (3) 1                                      (4) 3

**Ans. (1)**



Phosphoric acid



Basicity = 2

23. An element 'A' crystallises in HCP lattice. Element 'M' occupies  $\frac{2}{3}$ rd of tetrahedral voids. Determine formula of compound.

- (1)  $M_4A_3$  (2) MA  
 (3)  $M_2A_3$  (4)  $M_4A$

**Ans. (1)**

**Sol.** Effective number of particles in HCP lattice unit cell = 6  
 & number of tetrahedral voids are = 12

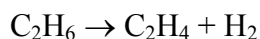
In one unit cell  $A = 6$

$$M = \frac{2}{3} \times 12 = 8$$

Therefore formula of compound  $M_8A_6$

Or  $M_4A_3$

24. Determine  $\Delta_r H$  of the reaction



given : Bond energy (in KJ/mol)

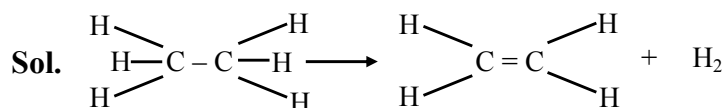
$C - C :$  340

$C = C :$  602

$C - H :$  411

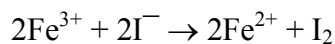
$H - H :$  432

**Ans. (128)**



$$\begin{aligned}
 \Delta_r H &= [E_{C-C} + 6E_{C-H}] - [E_{C=C} + 4E_{C-H} + E_{H-H}] \\
 &= E_{C-C} + 2E_{C-H} - E_{C=C} - E_{H-H} \\
 &= 340 + 822 - 602 - 432 \\
 &= 128 \text{ KJ/mol}
 \end{aligned}$$

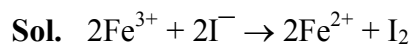
25. Calculate  $\Delta G^\circ$  of reaction.



Given :  $E^\circ_{Fe^{3+}/Fe^{2+}} = 0.77 \text{ V}$

$$E^\circ_{I_2/I^-} = 0.53 \text{ V}$$

**Ans. (46)**



$$\begin{aligned}
 E^\circ_{\text{Cell}} &= E^\circ_c - E^\circ_a \\
 &= 0.77 - 0.53 \\
 &= 0.24 \text{ V}
 \end{aligned}$$



$$\Delta G^\circ = -2 \times 96500 \times 0.24$$

$$= -46320 \text{ J}$$

$$= -46.32 \text{ KJ}$$

Ans. 46

**26. Assertion :**  $\text{Mg}(\text{HCO}_3)_2$  on heating produces  $\text{MgCO}_3$

**Reason :**  $\text{Mg}(\text{OH})_2$  has greater solubility than  $\text{MgCO}_3$ .

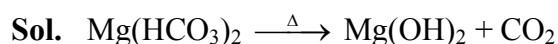
(1) Assertion is correct but reason is wrong

(2) Both assertion and reason are correct and reason is correct explanation of assertion

(3) Both assertion and reason are correct but reason is not correct explanation of assertion

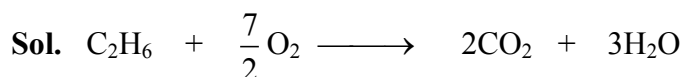
(4) Assertion is wrong but reason is correct.

Ans. (4)



**27.** Number of  $\text{H}_2\text{O}$  molecules produced from complete combustion of 3g ethane =  $N \times 10^{22}$ .  
Determine N. ( $N_A = 6.023 \times 10^{23}$ )

Ans. (18)



$$\text{Moles} = \frac{3}{20} = 0.1$$

$$\text{Moles} = 0.3$$

$$\therefore \text{Molecules} = 0.3 \times 6.022 \times 10^{23}$$

$$= 18.066 \times 10^{22}$$

$$\therefore N = 18$$

**28.** Match the column

**Column – I**

(A) Contact process

(B) Deacon's process

(C) Hydrogenation of vegetable oil

(D) Cracking of hydrocarbon

(1) A–Q ; B–R, C–S, D–P

(3) A–Q ; B–S, C–R, D–P

**Column – II**

(P) ZSM-5

(Q)  $\text{V}_2\text{O}_5$

(R)  $\text{CuCl}_2$

(S) Particle Ni

(2) A–Q ; B–R, C–P, D–S

(4) A–R ; B–Q, C–S, D–P

Ans. (1)