



# NARAYANA'S SENSATIONAL SU

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



# **ADMISSIONS OPEN (2020-21)**

## **OUR REGULAR CLASSROOM PROGRAMME**

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

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

#### **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-Lean 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

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

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

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

**APEX BATCH** Two years school Integrated Classroom Program - 2022 For JEE Main & Advance / NEET (for XI Studying Students)

#### Online Test

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





### TOLL FREE: 1800 102 3344 Visit us at : www.narayanagroup.com







### CHEMISTRY

**1.** The structure of tyrosine amino acid is





Ans. (2)









4. Which of the following reaction is ammonolysis reaction?

(1) R-C=N 
$$\xrightarrow{[H]}$$
 R-CH<sub>2</sub>-NH<sub>2</sub>  
(3) R-C-Cl  $\xrightarrow{NH_3}$  R-C-NH<sub>2</sub>  
 $\parallel 0$  0

(2) 
$$R-CH_2-Cl \xrightarrow{NH_3} R-CH_2-NH_2$$
  
(4)  $R-CH_2-Cl \xrightarrow{KCN} R-CH_2-CN$ 

Ans. (2)

5. Reducing smog contains (1) Smoke + fog + SO<sub>2</sub>

(2) Smoke + fog +CH<sub>3</sub>-C-H 
$$\parallel$$

(4) Smoke + fog + nitrogen oxide

(3) Smoke + fog + hydrocarbon

Ans. (1)

6. Which of the following compound is aromatic in nature?

(1) 
$$\stackrel{\ominus}{\frown}$$
 (2)  $\stackrel{\oplus}{\frown}$  (3)  $\stackrel{\ominus}{\frown}_{\ominus}$  (4)  $\stackrel{\ominus}{\frown}$ 

Ans. (1)

7. 
$$\begin{array}{ccc}
Cl & & ONa \\
\hline
& & & & & \\
\hline
& & & & & \\
\end{array}$$
What is the condition of temperature and pressure in above reaction?  
(1) 623K, Cu, 300 atm (2) 573K, 300 atm  
(3) 573K, Cu, 300 atm (4) 623K and 300 atm  
Ans. (4)

**8.** A benzamide undergoes Hoffman's Bromamide reaction to give (A), which reacts with chloroform and KOH to give (B). Identify compounds (A) and (B) -



Ans. (2)





- 9. What is IUPAC name of Mesityloxide ?
  - (1) 2–Methyl–4–oxopentan–2–ene
  - (2) 4–Methyl–2–oxopent–3–ene
  - (3) 4-Methylpent-3-en-2-one
  - (4) 2-Methylpent-2-en-4-one
- Ans. (3)

Sol. 
$$5 - 4$$
 Mesityloxide (4-Methylpent-3-en-2-one)

- 10. S-1 :  $R_f$  can be measured in the form of metre/centimetre
  - S-2 :  $R_f$  of a compound is same for all solvents
  - (1) Both Statement-1 and Statement-2 are correct
  - (2) Both Statement-1 and Statement-2 are false
  - (3) Statement-1 is correct and Statement-2 is false
  - (4) Statement-1 is false and Statement-2 is correct

#### Ans. (2)

- 11. Which of the following statement is incorrect about allosteric site?
  - (1) Allosteric site changes the shape of active site.
  - (2) Non competitive inhibitor changes the active site of enzyme binding at allosteric site.
  - (3) Some drug bind to a different site of enzyme which is allosteric site.
  - (4) Competitive inhibitors attach to the allosteric site.

Ans. (4)

- 12. Which of the following is false for heavy water?
  - (A) It is a byproduct in some fertilizer industries.
  - (B) It is used in exchange reactions for the study of reaction mechanism.
  - (C) Its dielectric constant is higher than  $H_2O$ .
  - (D) It is used as a moderator in nuclear reactor.
  - (1) A,B,C (2) A,B,C,D (3) C only (4) A,B
- Ans. (3)
- **Sol.** Fact based (Dielectric constant of  $D_2O$  is lesser than  $H_2O$ ).
- 13. Determine number of radial nodes in orbital represented by n = 4 &  $m_{\ell} = -3 \implies \ell = 3$
- Ans. (0)
- **Sol.**  $n = 4 \& m_{\ell} = -3 \Longrightarrow \ell = 3$

 $RN = n - \ell - 1 = 4 - 3 - 1 = 0$ 





- 14. Mole fraction of 100 molal aqueous solution of a solute is x. Given value of  $x \times 10^{-1}$ .
- Ans. (6)
- **Sol.** Let wt. of  $H_2O$  be 1000 g  $\Rightarrow$  moles of solute = 100

& mole of H<sub>2</sub>O =  $\frac{1000}{18}$ 

 $\Rightarrow$  mole fraction of solute =  $\frac{\text{moles of solute}}{\text{total mole}}$ 

- $= \frac{100}{100 + \frac{1000}{18}}$  $= \frac{1800}{2800} = 6.4 \times 10^{-1}$  $\Rightarrow x = 6.4$
- **15.** S-1 : Potassium permanganate on heating decomposes to produce potassium manganate.
  - S-2 : Potassium permanganate and potassium manganate are both paramagnetic.
  - (1) Both S1 and S2 are correct and S2 is a correct explanation of S1.
  - (2) Both S1 and S2 are correct but S2 is not correct explanation of S1.
  - (3) S1 is correct and S2 is incorrect.
  - (4) S1 is incorrect and S2 is correct.

Ans. (3)

- 16. 0.01 mole of weak acid HA ( $K_a = 2 \times 10^{-6}$ ) is mixed in 1L of 0.1 M HCl. Find  $\alpha$  of HA in solution. ( $\alpha \ll 1$ ). Report your answer as 'x' where  $\alpha = x \times 10^{-5}$ .
- Ans. (2)

Sol.

 $\begin{array}{ccccc} HA & \longleftrightarrow & H^{+} & + & A^{-} \\ C_{i} & 0.01 & 0 & 0 \\ C_{eq} & 0.01 & (1-\alpha) & 0.01\alpha + 0.1 & 0.01\alpha \\ & \approx 0.01 & \approx 0.1 \\ \\ \hline \frac{0.1 \times 0.01\alpha}{0.01} = 2 \times 10^{-6} & \therefore \alpha = 2 \times 10^{-5} & \therefore x = 2 \end{array}$ 





17.	Given : $\Delta H_{f}^{\circ}(Al_2O_{3(s)}) = -1596 \text{ KJ/mol}$	
	$\Delta H_{f}^{\circ}$ (CaO <sub>(s)</sub> ) = -635 KJ/mol	
	$3CaO(s) + 2Al(s) \rightarrow 3Ca(s) + Al_2O_3(s); \Delta_r H^o = ? (in KJ)$	
Ans.	(309)	
Sol.	$\Delta_{\rm r} {\rm H}^{\rm o} = \Delta {\rm H}^{\circ}_{\rm f} ({\rm products}) - \Delta {\rm H}^{\circ}_{\rm f} ({\rm reactants})$	
	$= \Delta H_{f}^{\circ}(Al_{2}O_{3(s)}) - 3 \Delta H_{f}^{\circ}(CaO_{(s)})$	
	= (-1596) - 3 (-635)	
	= 309 KJ	

**18.** In a molecule the central atom has 2 lone pairs and makes 3 bonds. What will be the shape of molecule

(1) See-Saw (2) T-shape (3) Trigonal pyramidal (4) Triangular planar

Ans. (2)

**19.** Arrange the following ions in conductivity order in aqueous solution.

$(1) Na^+ < K^+ < Rb^+ < Cs^+$	(2) $Cs^+ < Rb^+ < K^+ < Na^+$
(3) $K^+ < Rb^+ < Cs^+ < Na^+$	(4) $\mathrm{Rb}^+ < \mathrm{Cs}^+ < \mathrm{Na}^+ < \mathrm{K}^+$
(1)	

20. Order of magnitude of electron gain enthalpy  $(\Delta_{eg}H)$  of F, Cl, Br, I is (1) Cl > F > Br > I (2) F > Cl > Br > I

(3) I > Br > Cl > F (4) Cl > F > I > Br

Ans. (1)

Ans.

**Sol.** Electron gain enthalpy decreases down the group but 3<sup>rd</sup> period p-block element has more electron gain enthalpy than 2<sup>nd</sup> period element.

21.Spin magnetic moment of divalent ion (z = 25) in aqueous solution is :<br/>(1) 5.9 BM(2) 5.1 BM(3) 5 BM(4) 0 BMAns.(1)Sol. $Mn^{2+} \Rightarrow 3d^5$  (n = 5)

 $\mu = \sqrt{5(5+2)} = \sqrt{35} = 5.9 \text{ BM}$ 





22. In Ellingham diagram, the intersection point & the point at which graph changes its slope, represent (respectively):



- (1)  $\Delta_r G^\circ = 0$ , Melting point of metal
- (2)  $\Delta_r G^\circ < 0$ , Decomposition of metal oxide
- (3)  $\Delta_r G^\circ > 0$ , Decomposition of metal oxide
- (4)  $\Delta_r G^\circ = 0$ , Reduction of metal oxide
- Ans. (1)
- **23.** A non-reacting gas mixture of 6.4 g CH<sub>4</sub> & 8.8 g CO<sub>2</sub> is present in a 10L container at 27°C. Pressure in KPa =? (R = 8.314 J/K-mol)
- Ans. (150)

Sol.  $PV = n_{total} RT$   $P \times 10 \times 10^{-3} = (0.4 + 0.2) \times 8.314 \times 300$  P = 149652 Pa= 149.652 KPa





24. 
$$O \xrightarrow{HNO_3} O$$

Determine percentage yield of reaction if 0.4 mole of  $C_6H_5NO_2$  is formed by 39 g of  $C_6H_6$ 

**Sol.** Moles of 
$$C_6H_6 = \frac{39}{78} = 0.5$$

By conserving moles of carbon, moles of  $\bigcirc$  formed theoretically are 0.5

$$\Rightarrow \% \text{ yield} = \frac{\text{moles formed actually}}{\text{moles formed theoretically}} \times 100$$
$$= \frac{0.4}{0.5} \times 100 = 80 \%$$

**25.** 
$$Fe^{2+} + Cr_2O_7^{2-} + H^+ \longrightarrow Fe^{3+} + Cr^{3+} + H_2O$$

Molarity of Fe<sup>2+</sup> solution (15 ml), which reacts with 0.03 M, 20 mL  $Cr_2O_7^{2-}$  solution is  $x \times 10^{-2}$  M. Find x.

#### Ans. (24)

Sol. m eq.  $Fe^{2+} = m$  eq.  $Cr_2O_7^{2-}$   $M \times 15 \times 1 = 0.03 \times 6 \times 20$  $\therefore M = 0.24 M \therefore x = 24$