



JEE (Main)

PAPER-1 (B.E./B. TECH.)

2022

COMPUTER BASED TEST (CBT) Memory Based Questions & Solutions

Date: 29 July, 2022 (SHIFT-2) | TIME : (3.00 p.m. to 6.00 p.m)

Duration: 3 Hours | Max. Marks: 300

SUBJECT: CHEMISTRY

Resonance Eduventures Ltd.

Reg. Office & Corp. Office : CG Tower, A-46 & 52, IPIA, Near City Mall, Jhalawar Road, Kota (Raj.) - 324005

Ph. No.: +91-744-2777777, 2777700 | FAX No.: +91-022-39167222

To Know more : sms RESO at 56677 | Website : www.resonance.ac.in | E-mail : contact@resonance.ac.in | CIN : U80302RJ2007PLC024029

Toll Free : 1800 258 5555 | 7340010333 | [facebook.com/ResonanceIndia](https://www.facebook.com/ResonanceIndia) | twitter.com/ResonanceIndia | www.youtube.com/resonanceindia | blog.resonance.ac.in

This solution was download from Resonance JEE (MAIN) 2022 Solution portal

Resonance Eduventures Ltd. | JEE MAIN-2022 | DATE : 29-07-2022 (SHIFT-2) | PAPER-1 | MEMORY BASED | CHEMISTRY

PART : CHEMISTRY

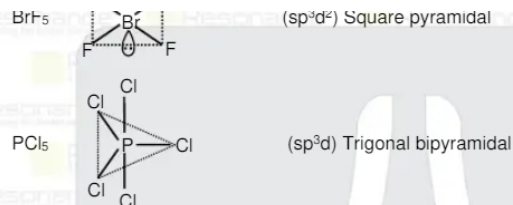
1. How many of the following species have sp^3d^2 hybridisation.

BrF_5 , PCl_5 , $[ICl_4]^-$, PCl_3 , SF_6 , ClF_3 , IF_5

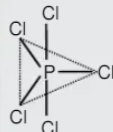
Ans. (4)



Sol. BrF_5 (sp³d²) Square pyramidal



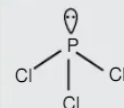
PCl_5 (sp³d) Trigonal bipyramidal



ICl_4^- (sp³d²) Square planar



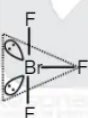
PCl_3 (sp³) Pyramidal



SF_6 (sp³d²) Octahedral



ClF_3 (sp³d) T-shape



IF_5 (sp³d²) Square pyramidal



Resonance Eduventures Ltd.

Reg. Office & Corp. Office : CG Tower, A-46 & 52, IPIA, Near City Mall, Jhalawar Road, Kota (Raj.) - 324005

Ph. No.: +91-744-2777777, 2777700 | FAX No. : +91-022-39167222

To Know more : sms RESO at 56677 | Website : www.resonance.ac.in | E-mail : contact@resonance.ac.in | CIN : U80302RJ2007PLC024029

Toll Free : 1800 258 5555 | 7340010333 | facebook.com/Resonanceedu | twitter.com/Resonanceedu | www.youtube.com/resonance | blog.resonance.ac.in

This solution was download from Resonance JEE (MAIN) 2022 Solution portal

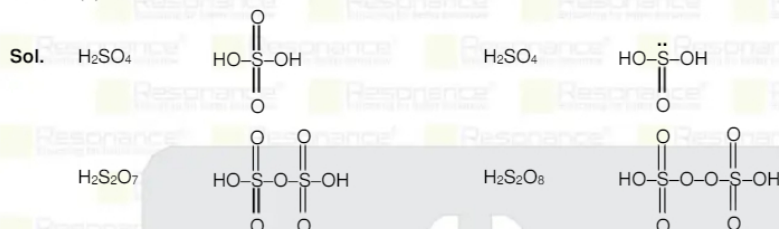
PAGE # 1

Resonance® Educating for better tomorrow | JEE MAIN-2022 | DATE : 29-07-2022 (SHIFT-2) | PAPER-1 | MEMORY BASED | CHEMISTRY

2. How many of the following have peroxo (O—O) bond.

H_2SO_4 , H_2SO_5 , $\text{H}_2\text{S}_2\text{O}_7$, $\text{H}_2\text{S}_2\text{O}_8$

Ans. (1)



3. **Statement-I** : Stannane is a molecular hydride.

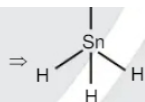
Statement-II : Stannane has planar structure.

- (1) Both Statement I and Statement II are correct
- (2) Statement I is correct but Statement II is incorrect
- (3) Statement I is incorrect but Statement II is correct.
- (4) Both Statement I and Statement II are incorrect

Ans. (2)

Sol. Stannane $\Rightarrow \text{SnH}_4$

H



\Rightarrow It is tetrahedral molecule

4. Correct increasing order of energy of following is :

(a) $n = 4, \ell = 2, m = 1, s = -\frac{1}{2}$

(b) $n = 4, \ell = 1, m = 1, s = +\frac{1}{2}$

(c) $n = 3, \ell = 2, m = -2, s = +\frac{1}{2}$

(d) $n = 3, \ell = 1, m = 1, s = +\frac{1}{2}$

(1) $d < c < b < a$

(3) $d < b < c < a$

(2) $a < b < c < d$

(4) $a < c < b < d$

Ans. (1)

Sol. Greater the value of $(n + \ell)$ greater is energy.

Resonance Eduventures Ltd.

Reg. Office & Corp. Office : CG Tower, A-46 & 52, IPIA, Near City Mall, Jhalawar Road, Kota (Raj.) - 324005

Ph. No.: +91-744-2777777, 2777700 | FAX No.: +91-022-39167222

To Know more : sms RESO at 56677 | Website : www.resonance.ac.in | E-mail : contact@resonance.ac.in | CIN : U80302RJ2007PLC024029

Toll Free : 1800 258 5555 | 7340010333 | facebook.com/ResonanceEdu | twitter.com/ResonanceEdu | www.youtube.com/resonance | blog.resonance.ac.in

This solution was download from Resonance JEE (MAIN) 2022 Solution portal

PAGE # 2



JEE MAIN-2022 | DATE : 29-07-2022 (SHIFT-2) | PAPER-1 | MEMORY BASED | CHEMISTRY

5. A gaseous mixture contain x gram of oxygen. 200 gram of Ne and have total pressure 25 bar and partial pressure of Ne is 20 bar. Then value of x is _____.
[Atomic mass of Ne = 20]

Ans. (80)

Sol. $P_{\text{Ne}} = [P_{\text{Total}}] X_{\text{Ne}}$
 $20 = 25 [X_{\text{Ne}}]$

$$[X_{\text{Ne}}] = \frac{4}{5}$$

$$\Rightarrow \left[\frac{\frac{200}{20}}{\frac{200}{20} + \frac{x}{32}} \right] = \frac{4}{5}$$

$$\frac{10}{10 + \left(\frac{x}{32} \right)} = \frac{4}{5}$$

$$50 = 40 + \frac{x}{8}$$

$$400 = 320 + x$$

$$x = 80 \text{ gram}$$

6. 200 ml, 0.01 M HCl solution is mixed with 400 ml, 0.01 M H_2SO_4 . Then pH of resulting is :
(1) 1.78 (2) 3.18 (3) 2.22 (4) 2.78

Ans. (1)

Sol. $[H^+] = \frac{0.01 \times 200 + 2 \times 0.01 \times 400}{600}$

$$= \frac{0.01 + 2 \times 0.01 \times 2}{3}$$

$$= \frac{0.01 + 0.04}{3}$$

$$= \frac{5}{3} \times 10^{-2}$$

$$\text{pH} = -\log [H^+]$$

$$= -\log \left(\frac{5}{3} \times 10^{-2} \right)$$

$$= -\left[\log \frac{5}{3} + \log 10^{-2} \right]$$

$$\begin{aligned}
 &= -[\log 5 - \log 3 - 2] \\
 &= -0.7 + 0.48 + 2 \\
 &= 2.48 - 0.7 \\
 &= 1.78
 \end{aligned}$$

Resonance Eduventures Ltd.

Reg. Office & Corp. Office : CG Tower, A-46 & 52, IPIA, Near City Mall, Jhalawar Road, Kota (Raj.) - 324005

Ph. No.: +91-744-2777777, 2777700 | FAX No.: +91-022-39167222

To Know more : sms RESO at 56677 | Website : www.resonance.ac.in | E-mail : contact@resonance.ac.in | CIN : U80302RJ2007PLC024029

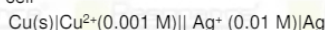
Toll Free : 1800 258 5555 | 7340010333 | facebook.com/ResonanceEdu | twitter.com/ResonanceEdu | www.youtube.com/reswatch | blog.resonance.ac.in

This solution was download from Resonance JEE (MAIN) 2022 Solution portal

PAGE # 3

Resonance
Educating for better tomorrow | JEE MAIN-2022 | DATE : 29-07-2022 (SHIFT-2) | PAPER-1 | MEMORY BASED | CHEMISTRY

7. For the cell



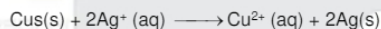
E_{cell} is 0.43 V and $E_{\text{Ag}^+/\text{Ag}}^0 = 0.80$ then value $E_{\text{Cu}^+/\text{Cu}}^0$ is $\times 10^{-2}$ V

$$\left(\text{Given } \frac{2.303RT}{F} = 0.6\right)$$

Ans. (34)

Sol. Anode : $\text{Cu(s)} \longrightarrow \text{Cu}^{2+}(\text{aq}) + 2\text{e}^-$

Cathode : $\text{Ag}^+ + \text{e}^- \longrightarrow \text{Ag(s)}$ 2



$$E_{\text{cell}} = E_{\text{cell}}^0 - \frac{0.06}{2} \log \frac{[\text{Cu}^{2+}]}{[\text{Ag}^+]^2}$$

$$0.43 = E_{\text{cell}}^0 - \frac{0.06}{2} \log \left(\frac{10^{-3}}{(10^{-2})^2} \right)$$

$$0.43 = E_{\text{cell}}^0 - 0.03 \log 10$$

$$E_{\text{cell}}^0 = 0.46 \text{ V}$$

$$E_{\text{cell}}^0 = E_{\text{Ag}^+/\text{Ag}}^0 - E_{\text{Cu}^{2+}/\text{Cu}}^0$$

$$E_{\text{Cu}^{2+}/\text{Cu}}^0 = (0.80 - 0.46) = 0.34 \text{ V} = 34 \times 10^{-2}$$

8. Which of the following ion have lowest hydration enthalpy (ΔH_{Hyd}).

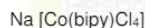
- (1) Mn^{2+} (2) Co^{2+} (3) Fe^{2+} (4) Cr^{2+}

Ans. (1)

Sol.

	Ion	ΔH_{Hyd} (kJ/mole)
(i)	Cr^{2+}	- 1925
(ii)	Mn^{2+}	- 1862
(i)	Fe^{2+}	- 1998
(i)	Co^{2+}	- 2079

9. Find sum of oxidation number and co-ordination number for complex.



Ans. (9)

Sol. $\text{Na}[\text{Co}(\text{bipy})\text{Cl}_4]$



$$1 + x + 0 - 4 = 0$$

$$x = +3$$

Co-ordination number = 6

Resonance Eduventures Ltd.

Reg. Office & Corp. Office : CG Tower, A-46 & 52, IPIA, Near City Mall, Jhalawar Road, Kota (Raj.) - 324005

Ph. No.: +91-744-2777777, 2777700 | FAX No.: +91-022-39167222

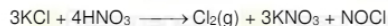
To Know more : sms RESO at 56677 | Website : www.resonance.ac.in | E-mail : contact@resonance.ac.in | CIN : U80302RJ2007PLC024029

Toll Free : 1800 258 5555 | 7340010333 | facebook.com/ResonanceEdu | twitter.com/ResonanceEdu | www.youtube.com/reswatch | blog.resonance.ac.in

This solution was download from Resonance JEE (MAIN) 2022 Solution portal

PAGE # 4

10. How many gram of NHNO_3 is used to from 110 gran KNO_3 according to following reaction :



- (1) 92 gram (2) 68 gram (3) 132 gram (4) 75 gram

Ans. (1)



$$\frac{4}{3} \left[\frac{110}{101} \right] \text{ mole} \quad \left(\frac{110}{101} \right) \text{ mole}$$

$$\text{Mass of HNO}_3 \text{ used} = \left[\frac{4}{3} \times \frac{110}{101} \right] \times 63$$

$$= 91.485$$

11. To increase setting time of portland cement which of the following compound is added.

- (1) CaSO_4 (2) $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ (3) $\text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$ (4) CaSO_3

Ans. (2)

Sol. Gypsum is added in portland cement to slow down the process of setting of the cement so that it gets sufficient time to hardened.

12. What happen in liquation process of Sn.

- (1) In liquation a low melting metal like tin can be made to flow on a slopping surface.
(2) Metal made to boil
(3) Metal is made to electrolysed
(4) NaOH is added to metal.

Ans. (1)

Sol. **Liquation**

In this method a low melting metal like tin can be made to flow on a sloping surface. In this way it is separated from higher melting impurities

13. 1.8 gram of a non-volatile solute is added to 62.5 cm^3 of a solvent (having freezing point 156 K). If freezing point of solution is 155.1 K , then molar mass of solute is _____.

$$[\text{Given } K_f(\text{solvent}) = 2 \frac{\text{K.Kg}}{\text{mole}} \text{ \& density of solvent} = 0.8 \text{ gram/cm}^3]$$

Ans. (80)

Sol. Mass of solvent = $d \times v = 0.8 \times 62.5 = 50 \text{ gram}$

$$\Delta T_f = K_f \times m$$

$$0.9 = 2 \left[\frac{1.8 \times 1000}{M_{\text{Solute}} \times 50} \right]$$

$$M_{\text{Solute}} = \left(\frac{2 \times 1.8 \times 1000}{0.9 \times 50} \right) = 80$$

Resonance Eduventures Ltd.

Reg. Office & Corp. Office : CG Tower, A-46 & 52, IPIA, Near City Mall, Jhalawar Road, Kota (Raj.) - 324005

Ph. No.: +91-744-2777777, 2777700 | FAX No.: +91-022-39167222

To Know more : sms RESO at 56677 | Website : www.resonance.ac.in | E-mail : contact@resonance.ac.in | CIN : U80302RJ2007PLC024029

Toll Free : 1800 258 5555 | 7340010333 | facebook.com/ResonanceEdu | twitter.com/ResonanceEdu | www.youtube.com/resonance | blog.resonance.ac.in

This solution was download from Resonance JEE (MAIN) 2022 Solution portal

PAGE # 5

14. 1 gram of radioactive substance (Half life = 30 year) is absorbed by a plant. After 100 year amount of radioactive substance left is $[X] \times 10^{-1}$ gram.

[Report your answer to nearest integer]

Ans. (1)

Sol. $t = \frac{1}{\lambda} \ln \left(\frac{a}{a-x} \right)$

$$100 = \left(\frac{30}{\ln 2} \right) \left[\ln \left(\frac{1}{w} \right) \right]$$

$$\left[\frac{100 \times \log 2}{30} \right] = \log \left(\frac{1}{w} \right)$$

$$1 = \log \left(\frac{1}{w} \right)$$

$$\frac{1}{w} = 10$$

$$\text{So } w = 0.1 \text{ gram}$$

15. 0.6 kg coal which contain 60% on carbon on combustion in presence of insufficient oxygen give CO and CO₂ according to following reaction.



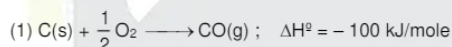
If 60% of carbon convert in CO, then calculate amount of heat released.

- (1) 6600 kJ (2) 4400 kJ (3) 5500 kJ (4) 7700 kJ

Ans. (1)

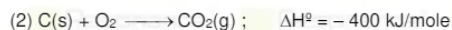
Sol. Mass of carbon = $(0.6 \times 10^3) \frac{60}{100} = \frac{600 \times 60}{100} = 360 \text{ gram}$

$$60\% \text{ of carbon} \Rightarrow \frac{360 \times 60}{100} = 216 \text{ gram}$$



$$\left(\frac{216}{12} \right) \Delta H = (-100) \frac{216}{12}$$

$$= -1800 \text{ kJ}$$



$$\left(\frac{144}{12} \right) \Delta H = (-400) \times \frac{144}{12} = -4800 \text{ kJ}$$

$$\text{Total heat released} = (1800 + 4800) = 6600 \text{ kJ}$$

Resonance Eduventures Ltd.

Reg. Office & Corp. Office : CG Tower, A-46 & 52, IPIA, Near City Mall, Jhalawar Road, Kota (Raj.) - 324005

Ph. No.: +91-744-2777777, 2777700 | FAX No.: +91-022-39167222

To Know more : sms RESO at 56677 | Website : www.resonance.ac.in | E-mail : contact@resonance.ac.in | CIN : U80302RJ2007PLC024029

Toll Free : 1800 258 5555 | 7340010333 | Facebook.com/ResonanceEdu | Twitter.com/ResonanceEdu | www.youtube.com/resowatch | blog.resonance.ac.in

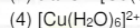
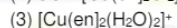
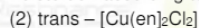
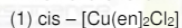
This solution was download from Resonance JEE (MAIN) 2022 Solution portal

PAGE # 6



| JEE MAIN-2022 | DATE : 29-07-2022 (SHIFT-2) | PAPER-1 | MEMORY BASED | CHEMISTRY

16. Which of the following compound show maximum distortion according to John teller effect.



Ans. (2)

Sol. According to John teller any nonlinear molecular system in a degenerate electronic state will be unstable and will undergo some kind of distortion which will lower its symmetry and energy and split the degenerate state.

In case of octahedral d⁹ configuration, the last electron may occupy either dz² or d_{x²-y²} orbitals of e_g set.

If it occupies dz² orbital most of the electron density will be concentrated between the metal and the two ligands on the z axis. Thus there will be greater electrostatic repulsion associated with these ligands than with the other four on xy plane.

The Jahn Teller effect is mostly observed in octahedral environments. The considerable distortions are usually observed in high spin d⁴, low spin d⁷ and d⁹ configuration.

17. Value of critical temperature of four gases He, CH₄, NH₃ and CO₂ is 4 K, 190 K, 408 K and 304 K respectively, then which gas is adsorb least on activated charcoal.

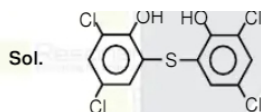


Ans. (1)

Sol. Greater the value of critical temperature greater is adsorption as He has least critical temperature so it adsorb least.

18. Number of chlorine atom in Bithionol is

Ans. (4)

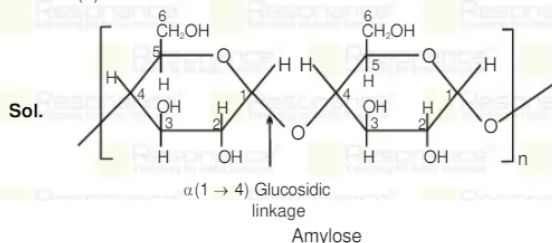


19. **Statement-I** : Amylose is insoluble in water.

Statement-II : Amylose is long unbranched chain with more than 200 glucose unit.

- (1) Statement-I is correct only.
 (2) Statement-II is correct only.
 (3) Both statement-I & II are correct.
 (4) Statement-I is incorrect and Statement-II is correct.

Ans. (4)



Resonance Eduventures Ltd.

Reg. Office & Corp. Office : CG Tower, A-46 & 52, IPIA, Near City Mall, Jhalawar Road, Kota (Raj.) - 324005

Ph. No.: +91-744-2777777, 2777700 | FAX No. : +91-022-39167222

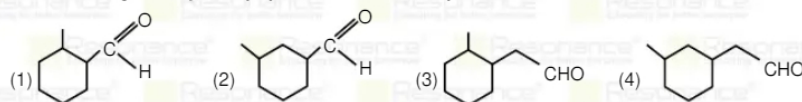
To Know more : sms RESO at 56677 | Website : www.resonance.ac.in | E-mail : contact@resonance.ac.in | CIN : U80302RJ2007PLC024029

Toll Free : 1800 258 5555 | 7340010333 | Facebook.com/ResonanceEdu | Twitter.com/ResonanceEdu | www.youtube.com/reswatch | blog.resonance.ac.in

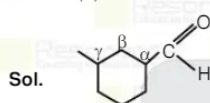
This solution was download from Resonance JEE (MAIN) 2022 Solution portal

PAGE # 7

20. Which of the given is γ -Methylcyclohexanecarbaldehyde.



Ans. (2)



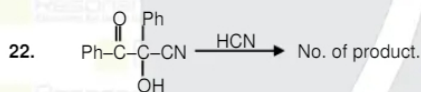
21. Which of the following is not a natural polymer.

- (1) Rayon (2) Starch (3) Protein (4) Rubber

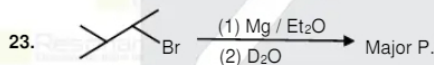
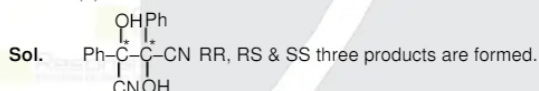
Ans. (1)

Sol. Starch, Protein, Rubber are natural polymer.

Rayon is a semi-synthetic fiber, made from natural sources of regenerated cellulose, such as wood and related agricultural products.

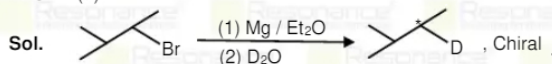


Ans. (3)



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

Ans. (1)



24. Which of the following oxides of nitrogen damage plant leaves and retard photosynthesis

- (1) NO_3^- (2) NO_2 (3) NO (4) NO_2^+

Ans. (2)

Sol. Nitrogen oxide (NO_2) damage plant leaves and retard photosynthesis.

Resonance Eduventures Ltd.

Reg. Office & Corp. Office : CG Tower, A-46 & 52, IPIA, Near City Mall, Jhalawar Road, Kota (Raj.) - 324005

Ph. No.: +91-744-2777777, 2777700 | FAX No. : +91-022-39167222

To Know more : sms RESO at 56677 | Website : www.resonance.ac.in | E-mail : contact@resonance.ac.in | CIN : U80302RJ2007PLC024029

Toll Free : 1800 258 5555 | 7340010333 | [facebook.com/ResonanceEdu](https://www.facebook.com/ResonanceEdu) | twitter.com/ResonanceEdu | www.youtube.com/resonance | blog.resonance.ac.in

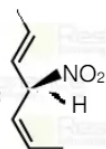
This solution was download from Resonance JEE (MAIN) 2022 Solution portal

PAGE # 8



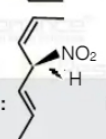
| JEE MAIN-2022 | DATE : 29-07-2022 (SHIFT-2) | PAPER-1 | MEMORY BASED | CHEMISTRY

25. Statement-I :



(A) is optically active.

Statement-II :

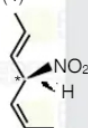


is mirror image of (A).

- (1) Statement-I is correct only.
(2) Statement-II is correct only.
(3) Both statement-I & II are correct.
(4) Statement-I is correct and Statement-II is incorrect.

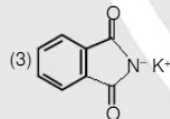
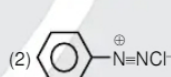
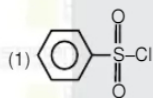
Ans. (4)

Sol.



(A) is optically active.

26. Which of the following is Hinsberg reagent.

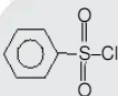


(4) I_2 / OH^-

Ans. (1)

Sol.

Hinsberg reagent is



27. With sodium 1.82 gram of an organic compound with molar mass 182 evolve 0.672 liter of hydrogen gas at STP. Total number of hydroxyl group in the compound is

Ans. (6)

Sol. Volume of H_2 gas = 0.672 L.

$$\text{Mole of } \text{H}_2 \text{ gas} = \frac{0.672}{22.4} = 3 \times 10^{-2}$$

No of H atoms per molecule of $\text{H}_2 = 2$.

$$\text{No. of } -\text{OH} \text{ (hydroxyl group in one molecule)} = \frac{3 \times 10^{-2}}{1 \times 10^{-2}} \times 2 = 6$$

Resonance Eduventures Ltd.

Reg. Office & Corp. Office : CG Tower, A-46 & 52, IPIA, Near City Mall, Jhalawar Road, Kota (Raj.) - 324005

Ph. No.: +91-744-2777777, 2777700 | FAX No. : +91-022-39167222

To Know more : sms RESO at 56677 | Website : www.resonance.ac.in | E-mail : contact@resonance.ac.in | CIN : U80302RJ2007PLC024029

Toll Free : 1800 258 5555 | 7340010333 | [facebook.com/ResonanceEdu](https://www.facebook.com/ResonanceEdu) | twitter.com/ResonanceEdu | www.youtube.com/resonance | blog.resonance.ac.in

This solution was download from Resonance JEE (MAIN) 2022 Solution portal

PAGE # 9

**Resonance®**
Educating for better tomorrow**JEE (Main) 2022**

JUNE (SESSION-1) RESULT

लगातार दूसरे वर्ष, कोटा का **श्रेष्ठ परिणाम, रेजोनेंस के नाम**JEE (Main) 2022
JUNE (Session-1)OVERALL NTA SCORE#
99.998%ile

NTA SCORE (%ile)

100

In CHEMISTRY

**VARDAN VERMA**
Classroom Student**CHAITANYA AGGARWAL**
Classroom Student

JEE (Adv.) 2021

AIR

8**BEST RANK**
from Kota Classroom among
all Institutes of KotaHighest Marks (114/120)
In Chemistry in India

"वर्दान वर्मा का %ile Score कोटा में रहकर JEE की तैयारी करने वाले सभी संस्थानों के सभी क्लासरूम विद्यार्थियों में से **HIGHEST %ile** है"

#As per logical information available in Public Domain till 16th July**ADMISSIONS OPEN: 2022-23**

— For Class XII Passed Students —

TARGET

JEE (Main+Advanced) 2023

COURSE

VIJAY (JR)CLASS STARTS
1st & 16th Aug**TARGET**

JEE (Main) 2023

COURSE

AJAY (ER)CLASS STARTS
1st, 16th & 29th Aug**Scholarship* upto 100%**

on the basis of JEE (Main) Percentile Score

अपनी **स्कॉलरशिप** जानने के लिए **अपनी जेईई (मेन) परसेंटाइल वाट्सअप करें: 73400-10345****Resonance Eduventures Ltd.**Kota Study Centre & Registered Corporate Office: CG Tower, A-46 & 52, IPIA, Near City Mall, Jhalawar Road, Kota (Raj.) - 324005
Tel. No.: 0744-2777777, 2777700 | CIN: U80302RJ2007PLC024029 | www.resonance.ac.in | contact@resonance.ac.in