



JEE (MAIN) 2024

MEMORY BASED QUESTIONS & SOLUTIONS

SHIFT-1

DATE & DAY: 27th January 2024 & Saturday

PAPER-1

Duration: 3 Hrs.
Time: 09:00 - 12:00 IST

SUBJECT: CHEMISTRY

ADMISSIONS OPEN FOR CLASS 12+
ACADEMIC SESSION 2024-25

<p>TARGET: JEE (ADV.) 2024 For Class XII Passed Student VISHESH COURSE MODE: OFFLINE/ONLINE CLASS STARTS 08th APRIL, 2024</p>	<p>TARGET: JEE (MAIN) 2024 For Class XII Passed Student ABHYAAS COURSE MODE: OFFLINE/ONLINE CLASS STARTS 08th APRIL, 2024</p>
--	--

SCHOLARSHIP ON THE BASIS OF JEE (MAIN) 2024 %ILE/AIR

REGISTERED & CORPORATE OFFICE (CIN: U80302RJ2007PLC024029):
CG Tower, A-46 & 52, IPIA, Near City Mall, Jhalawar Road, Kota (Rajasthan) - 324005

0744-2777777 | 73400 10345 | contact@resonance.ac.in | www.resonance.ac.in | Follow Us: @ResonanceEdu | @Resonance_Edu

This solutions was download from Resonance JEE (Main) 2024 Solution Portal



PERCENTILE BOOSTER COURSE

COURSE COMMENCEMENT: 5th FEBRUARY 2024

TARGET **JEE (Main) 2024**
April Attempt

MODE:
OFFLINE/
ONLINE

COURSE Concept

Percentile Booster Course (PBC) is for those students who want to boost their percentile in JEE-Main 2024 through a systematic complete course revision & practice plan.

In this course, daily chapter wise tests, Full Syllabus Test, JEE Preparatory Test will be conducted and each test will be followed by proper offline/online discussion class.

COURSE FEE

Offline: ₹4999 | Online: ₹2499

COURSE FEATURES

- Complete Course Coverage
- Regular Practice through Daily Online Practice Test
- Full Syllabus Test
- Approx 2500 practice Ques.
- Chapter wise Test
- Joint Preparatory Test
- Back up support of recorded lectures
- Regular Test discussion classes for concept clearance

JEE (Main) 2024 April Attempt में

अधिकतम %ile प्राप्त करने के लिए आज ही Join करें!

SCAN TO
APPLY



*T & C Apply

ADMISSIONS OPEN FOR CLASS 12+

ACADEMIC SESSION 2024-25

TARGET: JEE (ADV.) 2024

For Class XII Passed Student
VISHESH COURSE
MODE: OFFLINE/ONLINE

CLASS STARTS
08TH APRIL, 2024

TARGET: JEE (MAIN) 2024

For Class XII Passed Student
ABHYAAS COURSE
MODE: OFFLINE/ONLINE

CLASS STARTS
08TH APRIL, 2024

SCHOLARSHIP ON THE BASIS OF JEE (MAIN) 2024 %ILE/AIR



JEE(Main) 2024 | DATE : 27-01-2024 (SHIFT-1) | PAPER-1 | MEMORY BASED | CHEMISTRY

PART : CHEMISTRY

- Assertion** : Boron has highest melting point in group 13, that is 2453 K.
Reason : Boron has solid crystalline lattice structure.
(1) Both Assertion & Reason are correct and reason is correct explanation of assertion
(2) Both Assertion & Reason are correct and reason is not the correct explanation of assertion
(3) Assertion is correct and reason is incorrect
(4) Assertion is incorrect and reason is incorrect

Ans. (1)

Sol. Boron is non-metallic in nature. It is extremely hard and black coloured solid. Due to very strong crystalline lattice, boron has unusually high melting point. Rest of the members are soft metals with low melting point and high electrical conductivity.

Property	B	Al	Ga	In	Tl
Melting point / K	2453	933	303	430	576

2. Sum of bond order of NO^+ and CO is _____.

Ans. (6)

Species	Total number of electrons	Bond order
NO^+	14	3
CO	14	3

3. Which of the following will not show variable oxidation state ?

(1) Br (2) Cl (3) F (4) I

Ans. (3)

Sol. Fluorine in its compound shows only -1 oxidation state. As its electronegativity is highest and it has no vacant d-orbital.

4. Among the following, which one is polar molecule _____.

(1) CCl_4 (2) CO_2 (3) CHCl_3 (4) $\text{CH}_2=\text{CH}_2$

Ans. (3)

Sol. CHCl_3 is having permanent dipole moment, therefore it is polar molecule whereas all other given molecules have dipole moment = 0.

5. Which of the following electronic configuration have maximum value of magnetic moment (spin only) ?

(1) $[\text{Ar}]3d^3$ (2) $[\text{Ar}]3d^6$ (3) $[\text{Ar}]3d^6$ (4) $[\text{Ar}]3d^7$

Ans. (3)

Sol.

	Electronic configuration	No. of unpaired electron
1.	$[\text{Ar}]3d^3 \Rightarrow \uparrow \uparrow \uparrow \uparrow \uparrow$	3
2.	$[\text{Ar}]3d^6 \Rightarrow \uparrow \downarrow \uparrow \downarrow \uparrow \uparrow$	2
3.	$[\text{Ar}]3d^6 \Rightarrow \uparrow \downarrow \uparrow \downarrow \uparrow \uparrow$	4
4.	$[\text{Ar}]3d^7 \Rightarrow \uparrow \downarrow \uparrow \downarrow \uparrow \uparrow \uparrow$	3

More are the no. of unpaired electron, more is the magnetic moment (spin only)

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/resowatch | blog.resonance.ac.in

This solution was download from Resonance JEE(Main) 2024 Solution portal

PAGE # 1



JEE(Main) 2024 | DATE : 27-01-2024 (SHIFT-1) | PAPER-1 | MEMORY BASED | CHEMISTRY

6. How many of the following species have sulphur atom in its +4 oxidation state ?

SO_3 , SF_4 , H_2SO_4 , BaSO_4 , $\text{H}_2\text{S}_2\text{O}_7$, SO_2 , SOCl_2

Ans. (3)

Sol.

Species	SO_3	SF_4	H_2SO_4	BaSO_4	$\text{H}_2\text{S}_2\text{O}_7$	SO_2	SOCl_2
Oxidation state of sulphur	+6	+4	+6	+6	+6	+4	+4

7. The correct increasing order of magnetic moment (spin only) of the following species are :

(P) = $[\text{FeF}_6]^{3-}$; (Q) = $[\text{V}(\text{H}_2\text{O})_6]^{2+}$; (R) = $[\text{Fe}(\text{H}_2\text{O})_6]^{2+}$

(1) $Q < R < P$ (2) $P < Q < R$ (3) $P < R < Q$ (4) $R < Q < P$

Ans. (1)

Sol.

	Species	Electronic configuration	No. of unpaired electron
(P)	$[\text{FeF}_6]^{3-}$	$[\text{Ar}]3d^5 \Rightarrow \uparrow \uparrow \uparrow \uparrow \uparrow$	5
(Q)	$[\text{V}(\text{H}_2\text{O})_6]^{2+}$	$[\text{Ar}]3d^3 \Rightarrow \uparrow \uparrow \uparrow$	3
(R)	$[\text{Fe}(\text{H}_2\text{O})_6]^{2+}$	$[\text{Ar}]3d^6 \Rightarrow \uparrow \downarrow \uparrow \downarrow \uparrow \uparrow$	4

More are the no. of unpaired electrons more is the magnetic moment (spin only). H_2O is weak field ligand therefore magnetic properties of central metal ion and complex will be same.

8. $\text{PbCrO}_4 \xrightarrow{\text{HotNaOH}}$ complex
(Yellow)

Complex is having :

(1) $\text{CN} = 4$, Dianion (2) $\text{CN} = 6$, Dianion

- (3) CN = 3, Dianion (4) CN = 5, Dianion
- Ans.** (1)
- Sol.** Yellow ppt. of PbCrO_4 ↓ is soluble in hot NaOH, forming $[\text{Pb}(\text{OH})_4]^{2-}$ as Pb^{2+} is amphoteric in nature.
9. Identify the correct electronic configuration of an element with atomic number (Z) = 60.
- (1) $[\text{Xe}]4f^4 6s^2$ (2) $[\text{Xe}]4d^1 4f^3 6s^2$
 (3) $[\text{Xe}]4d^1 4f^4 6s^1$ (4) $[\text{Xe}]4d^1 4f^5 6s^0$
- Ans.** (1)
- Sol.** $\text{Nd}_{60} = [\text{Xe}]4f^4 6s^2$
10. **Statement-1** : $(\text{NH}_4)_2\text{CO}_3$ is basic in nature.
Statement-2 : Acidic or basic nature of salt of WBWA depends on K_a & K_b .
- (1) Both **Statement-1** & **Statement-2** are correct.
 (2) Both **Statement-1** & **Statement-2** are incorrect.
 (3) **Statement-1** is correct whereas **Statement-2** is incorrect.
 (4) Both **Statement-1** and **Statement-2** are incorrect.
- Ans.** (1)
- Sol.** $\text{pH}_{\text{WBWA}} = 7 + \frac{1}{2}\text{p}K_a - \frac{1}{2}\text{p}K_b$
- The above equation shows that pH depends on K_a & K_b value.

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/resowatch | blog.resonance.ac.in

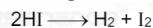
This solution was download from Resonance JEE(Main) 2024 Solution portal

PAGE # 2



| JEE(Main) 2024 | DATE : 27-01-2024 (SHIFT-1) | PAPER-1 | MEMORY BASED | CHEMISTRY

11. In the given reaction :



	[HI]	Rate of reaction
I	0.05 M	$7.5 \times 10^{-4} \text{ M sec}^{-1}$
II	0.1 M	$3 \times 10^{-3} \text{ M sec}^{-1}$
III	0.2 M	$1.2 \times 10^{-2} \text{ M sec}^{-1}$

order of reaction is :

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

Ans. (3)

Sol. As we see, on doubling the concentration, rate becomes four times therefore $n = 2$.

12. Total number of electrons having $n = 4$ and $s = +\frac{1}{2}$.

Ans. (16)

Sol.

Subshell	4s	4p	4d	4f
	$\uparrow\downarrow$	$\uparrow\downarrow\uparrow\downarrow$	$\uparrow\downarrow\uparrow\downarrow\uparrow\downarrow\uparrow\downarrow$	$\uparrow\downarrow\uparrow\downarrow\uparrow\downarrow\uparrow\downarrow\uparrow\downarrow\uparrow\downarrow$
No. of electrons with $+\frac{1}{2}$	1	3	5	7

13. **Statement-1** : f-block is placed separately in periodic table to preserve the basic classification principle of periodic table.

Statement-2 : s-block elements can be found in nature in pure elemental state.

- (1) Both **Statement-1** & **Statement-2** are correct.
 (2) **Statement-1** is correct **Statement-2** is incorrect.
 (3) **Statement-1** is incorrect whereas **Statement-2** is correct.
 (4) Both **Statement-1** and **Statement-2** are incorrect.

Ans. (2)

Sol. **Statement-1** is correct while **Statement-2** is incorrect as s-block elements are found in combined form as they are highly reactive.

14. An ideal gas expands isothermally from 30 dm^3 to 45 dm^3 against constant external pressure of 80 kPa, then heat involved is _____ bar $\times \text{dm}^3$.

Ans. (12)

Sol. As process is isothermal ir-reversible expansion of an ideal gas so $(\Delta U = 0)$ & $(q = -w)$

pressure = 80 kPa = 0.8 bar

$$\begin{aligned}q &= -w = P\Delta V \\ &= 0.8 \times [45-30] \\ &= 0.8 \times 15 \\ &= 12 \text{ bar} \times \text{dm}^3.\end{aligned}$$

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](https://www.facebook.com/ResonanceEdu) | twitter.com/ResonanceEdu | www.youtube.com/resowatch | blog.resonance.ac.in

This solution was download from Resonance JEE(Main) 2024 Solution portal

PAGE # 3

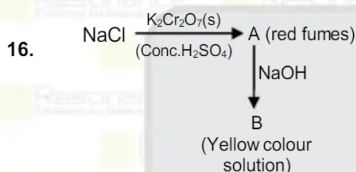


JEE(Main) 2024 | DATE : 27-01-2024 (SHIFT-1) | PAPER-1 | MEMORY BASED | CHEMISTRY

15. In a solution showing, negative deviation.
- (1) Boiling point increases, vapour pressure decreases.
 - (2) Boiling point decreases, vapour pressure increases.
 - (3) Both boiling point and vapour pressure decreases.
 - (4) Both boiling point and vapour pressure increases.

Ans. (1)

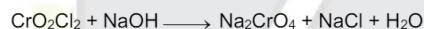
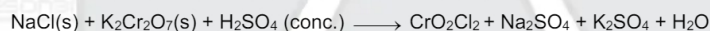
Sol. For solution showing negative deviation VP decreases & BP increases. Because, interparticle attraction increases due to mixing.



- | | [A] | [B] |
|-----|---------------------------|------------------------------------|
| (1) | CrO_2Cl_2 | Na_2CrO_4 |
| (2) | Cr_2O_3 | $\text{Na}_2\text{Cr}_2\text{O}_7$ |
| (3) | CrO_2Cl_2 | $\text{Na}_2\text{Cr}_2\text{O}_7$ |
| (4) | CrO | $\text{Na}_2\text{Cr}_2\text{O}_7$ |

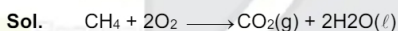
Ans. (1)

Sol. These are reactions of chromyl chloride test for acid react Cl^- .



17. On complete combustion of methane, 22 gram of CO_2 is obtained, then initial mass of methane is _____ gram.

Ans. (8)



$$\left(\frac{22}{44}\right)$$

0.5 mole 0.5 mole
mass of $\text{CH}_4 = 0.5 \times 16 = 8$ gram.

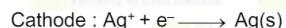
18. On electrolysis 5600 ml of O_2 is produced at NTP at anode, then amount of Ag deposited at cathode by using same charge is _____ gram.

Ans. (108)

Sol. $n_{\text{O}_2} = \frac{5600}{22400} = \frac{1}{4}$ mole



$$\frac{1}{4} \text{ mole} \quad 1\text{F}$$



$$1\text{F} \quad 1 \text{ mole}$$

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/resowatch | blog.resonance.ac.in

This solution was download from Resonance JEE(Main) 2024 Solution portal

PAGE # 4



JEE(Main) 2024 | DATE : 27-01-2024 (SHIFT-1) | PAPER-1 | MEMORY BASED | CHEMISTRY

19. 0.08 kg of an ideal gas is heated from 300 K to 305 K, then change in its internal energy is _____
 $\times 10^{-3}$ kcal [nearest integer].

(given for ideal gas = $0.17 \frac{\text{kcal}}{\text{kg} \times ^\circ\text{C}}$)

Ans. (68)

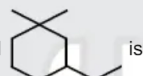
Sol. For ideal gas change in internal energy (ΔU)

$$\Delta U = m.S. \Delta T$$

$$= 0.08 \times 0.17 \times 5$$

$$= 0.068 \text{ kcal} = 68 \times 10^{-3} \text{ kcal}$$

20. IUPAC name of the given compound is



(1) 3-Ethyl-1,1-dimethylcyclohexane

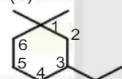
(2) 1-Ethyl-3, 3-dimethylcyclohexane

(3) 1-Ethyl-3-methylcyclohexane

(4) 1,1-Dimethyl-3-Ethylcyclohexane

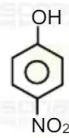
Ans. (1)

Sol.

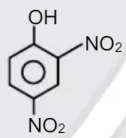


3-Ethyl-1, 1-dimethylcyclohexane

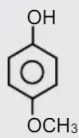
21. Correct order of acidic strength of following compound is :



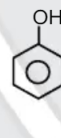
(a)



(b)



(c)



(d)

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

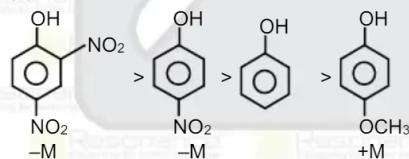
(2) $b > a > c > d$

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

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

Ans. (3)

Sol.

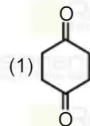


-M

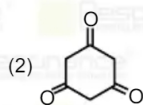
-M

+M

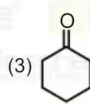
22. Which has maximum enol %



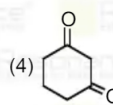
(1)



(2)



(3)



(4)

Ans. (2)

Resonance Eduventures Ltd.

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

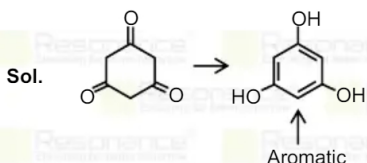
Ph. No.: +91-744-2777777, 2777700 | FAX No. : +91-022-39167222

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/resowatch | blog.resonance.ac.in

This solution was download from Resonance JEE(Main) 2024 Solution portal


PAGE # 5



23. Number of polar solvents in
 $\text{CH}_2=\text{CH}_2$, CCl_4 , CHCl_3 , CO_2 is
 a b c d

Ans. (1)

Sol. Only CHCl_3 is polar solvent whereas $\text{CH}_2=\text{CH}_2$, CCl_4 and CO_2 is non polar.

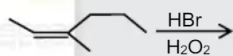
24. Correct statement about  is

- (1) Aromatic (2) Benzoid aromatic
 (3) Non benzoid aromatic (4) Alicyclic

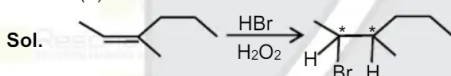
Ans. (4)

Sol. Given compound is cyclic as well as aliphatic, hence it is alicyclic.

25. Count the number of stereoisomers formed in the product :



Ans. (4)



Since the product has two chiral carbon, hence overall 4 stereoisomers [RR, RS, SR and SS] will be formed.

26. Nucleotide pairs are joined together by
 (1) Glycosidic linkage (2) Peptide linkage
 (3) Phosphate diester linkage (4) Hydrogen bond

Ans. (3)

27. Correct option of following is

- (1) SN^1 ----- Racemisation ; SN^2 ----- Inversion
 (2) SN^1 ----- Racemisation ; SN^2 ----- Retention
 (3) SN^1 ----- Inversion ; SN^2 ----- Racemization
 (4) SN^1 ----- Retention ; SN^2 ----- Inversion

Ans. (1)

Sol. Since SN^1 reaction occurs via carbocation intermediate hence racemization takes place, whereas in SN^2 , due to basic side back side attack inversion of configuration takes place.

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

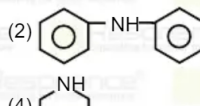
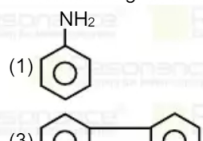
To Know more : sms RESO at 56677 | Website : www.resonance.ac.in | E-mail : contact@resonance.ac.in | CIN : U80302RJ2007PLC024029

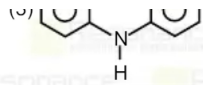
Toll Free : 1800 258 5555 | 7340010333 |  facebook.com/ResonanceEdu |  twitter.com/ResonanceEdu |  www.youtube.com/resowatch |  blog.resonance.ac.in

This solution was download from Resonance JEE(Main) 2024 Solution portal

PAGE # 6

28. Which of the given is most basic.





Ans. (4)

Sol. Lone pair of N is being used in aromatic ring, whereas in A and B, lone pair is being delocalised in aromatic ring, whereas in 'B' lone pair is localised.

29. **Statement-I** : Ethanol gives immediate turbidity in Lucas test.

Statement-II : p-nitro phenol is more acidic than m and o-nitro phenol.

(1) Only Statement-I is correct.

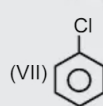
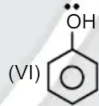
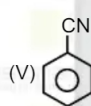
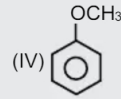
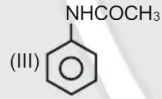
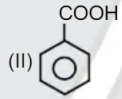
(2) Only Statement-II is correct.

(3) Both Statement-I and II is correct.

(4) Both Statement-I and II is incorrect.

Ans. (2)

30. Number of meta directing group are :



Ans. (3)

Sol. (I), (II) and (V) are classified as meta directing group in electrophilic aromatic substitution reaction.

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) 2024 Solution portal

PAGE # 7



JEE (Advanced) 2023 RESULT

AIR
7



BIKKINA A. CHOWDARY

All India Ranks (AIR-CRL) in
Top 50 : 8 Top 100 : 15

AIR **22**



DESHANK P. SINGH

AIR **26**



MAYANK SONI

AIR **29**



TANISHQ M. MANDHANE

AIR **32**



KRITIN GUPTA

AIR **33**



AIR **37**



AIR **44**



All Students are from our
Offline/Online Classroom Programs

NAMAN GOYAL

S S SUMEDH

KAUSHAL VIJAYVERGIYA

JEE (Main) 2023 RESULT

22 वर्षों से लगातार... श्रेष्ठ शिक्षण, श्रेष्ठ परिणाम...

6 AIRs in TOP-50

AIR **5**

300/300 Marks



KAUSHAL VIJAYVERGIYA

AIR **26**

100%ile



SOHAM DAS

AIR **29**

100%ile



ASHIK STENNY

AIR **31**

100%ile



KRISH GUPTA

AIR **34**

100%ile



MAYANK SONI

AIR **50**

100%ile (Maths)



HARSHAL LASOD

ADMISSIONS OPEN

Academic Session 2024-25

Class: V to XII & XII+



JEE
(Advanced)



JEE
(Main)



NEET
(UG)

SCHOLARSHIP UPTO



100%

Based on ResoNET (Scholarship Test)

REGISTERED & CORPORATE OFFICE (CIN: U80302RJ2007PLC024029)

CG Tower, A-46 & 52, IPIA, Near City Mall, Jhalawar Road, Kota (Rajasthan) - 324005

0744-2777777 | 73400 10345 | contact@resonance.ac.in | www.resonance.ac.in | Follow Us: @ResonanceEdu | @Resonance_Edu