Sri Chaitanya IIT Academy.,India.

A.P T.S KARNATAKA TAMILNADU MAHARASTRA DELHI RANCHI

A right Choice for the Real Aspirant

ICON Central Office - Madhapur - Hyderabad

SEC: Sr.Super60_STERLING BT	**JEE-MAIN**	**Date: 06-09-2025**
Time: 09:00AM to 12:00PM	**RPTM-05**	**Max. Marks: 300**

IMPORTANT INSTRUCTION:

1. Immediately fill in the Admission number on this page of the Test Booklet with **Blue/Black** Ball Point **Pen** only.
2. The candidates should not write their Admission Number anywhere (except in the specified space) on the Test Booklet/ Answer Sheet.
3. The test is of **3 hours** duration.!
4. The Test Booklet consists of **75 Questions.** The maximum marks are **300.**
5. There are **three** parts in the question paper 1,2,3 consisting of **Mathematics, Physics** and **Chemistry** having **25 Questions** in each subject and subject having **two sections.**
   (I) Section –I contains **20 Multiple Choice Questions** with only one correct option.
   Marking scheme: +4 for correct answer, **0** if not attempt and **-1** in all other cases.
   (II) Section-II contains **05 Numerical Value Type Questions.**
   - The Answer should be within **0 to 9999.** If the Answer is in **Decimal** then round off to the **Nearest Integer** value (Example i,e. If answer is above **10** and less than **10.5** round off is **10** and If answer is from **10.5** and less than **11** round off is **11).**

   To cancel any attempted question bubble on the question number box.
   For example: To cancel attempted Question 21. Bubble on 21 as shown below

   Question Answered for Marking Question Cancelled for Marking
   Marking scheme: +4 for correct answer, **0** if **not attempt** and **-1** in all other cases.
6. Use **Blue / Black Point Pen only** for writing particulars / marking responses on the Answer Sheet. **Use of pencil is strictly prohibited.**
7. No candidate is allowed to carry any textual material, printed or written, bits of papers, mobile phone any electron device etc, except the Identity Card inside the examination hall.
8. Rough work is to be done on the space provided for this purpose in the Test Booklet only.
9. On completion of the test, the candidate must hand over the Answer Sheet to the invigilator on duty in the Hall. **However, the candidate are allowed to take away this Test Booklet with them.**
10. **Do not fold of make any stray marks on the Answer Sheet**

Name of the Candidate (in Capital): _____

Admission Number: | | | | | | | | | |

Candidate's Signature:_____ **Invigilator's Signature:** _____

06-09-25_Sr.Super60_STERLING BT_Jee-Main_RPTM-05_Test Syllabus

MATHEMATICS : Definite Integration

PHYSICS : Gravitation: Law of gravitation, Gravitational potential and field, Acceleration due to gravity, Kepler's law, Motion of planets and satellites in circular orbits, Escape velocity, Geostationary orbits (Important for ADVANCED)

Electrostatics: Coulomb's law, Electric field and potential, Electrical potential energy of a system of point charges and of electrical dipoles in a uniform electrostatic field, Electric field lines.

(In Phy & Che Each Out of 25Qs, 10 Qs From NCERT is Mandatory)

CHEMISTRY : Aldehydes & Ketones: Preparation of aldehydes and ketones from acid chlorides and nitriles, aldehydes from esters, benzaldehyde from toluene and benzene, conversion of alcohols into aldehydes and ketones Reactions: oxidation, reduction, oxime and hydrazone formation, Aldol condensation and Family aldol reactions, . Cannizzaroreaction, haloform reaction and nucleophilic addition reactions with RMgX, NaHSO3, HCN, water, alcohol, RSH, amine and derivatives

(In Phy & Che Each Out of 25Qs, 10 Qs From NCERT is Mandatory)

MATHEMATICS **Max Marks: 100**

SECTION-I (SINGLE CORRECT ANSWER TYPE)

This section contains **20 Multiple Choice Questions.** Each question has 4 options (1), (2), (3) and (4) for its answer, out of which ONLY ONE option can be correct.

Marking scheme: +4 for correct answer, 0 if not attempted and –1 in all other cases.

1. Let $f(x)=\int_0^x t\left(t^2-9t+20\right)dt, (1\le x\le 5)$ then the range of '$f(x)$' is

1) $\left[\frac{29}{4},30\right]$ 2) $\left[\frac{29}{4},32\right]$ 3) $\left[\frac{21}{4},32\right]$ 4) $[29,120]$

2. $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \frac{96x^2\cos^2 x}{\left(1+e^x\right)}dx=$

1) $\left(2\pi^2-12\right)$ 2) $\pi\left(\pi^2-6\right)$ 3) $\frac{\pi}{3}\left(2\pi^2-12\right)$ 4) $\pi\left(2\pi^2-12\right)$

3. Let $J=\int_0^1 \frac{x}{1+x^8}dx$ consider the following Statements :

Statement-I : $J>\frac{1}{4}$ Statement-II : $J<\frac{\pi}{4}$ then

1) Only Statement-I is true
2) Only Statement-II is true
3) Both Statement-I and Statement-II are true
4) Both Statement-I and Statement-II are false

4. $4.\int_0^1 \frac{1}{\sqrt{3+x^2}+\sqrt{1+x^2}}dx-3\log_e\sqrt{3}$ is equal to

1) $2+\sqrt{2}+\log_e\left(1+\sqrt{2}\right)$ 2) $2-\sqrt{2}-\log_e\left(1+\sqrt{2}\right)$

3) $2+\sqrt{2}-\log_e\left(1+\sqrt{2}\right)$ 4) $2-\sqrt{2}+\log_e\left(1+\sqrt{2}\right)$

5. $\int_{-1}^{1} \frac{\left(1+\sqrt{|x|-x}\right)e^x+\left(\sqrt{|x|-x}\right)e^{-x}}{e^x+e^{-x}}dx=$

1) $3-\frac{2\sqrt{2}}{3}$ 2) $2+\frac{2\sqrt{2}}{3}$ 3) $1-\frac{2\sqrt{2}}{3}$ 4) $1+\frac{2\sqrt{2}}{3}$

6. Let $f(x)+2f\left(\frac{1}{x}\right)=x^2+5$ and $2g(x)-3g\left(\frac{1}{2}\right)=x,(x>0)$ if $\alpha=\int_1^2 f(x)dx$ and $\beta=\int_1^2 g(x)dx$, then $18\alpha-2\beta=$

1) 22 2) 11 3) 1 4) 0

7. Match the following

LIST-I		LIST-II	
A	If $'\theta_1'$ and $'\theta_2'$ be respectively the smallest and largest vales of θ in $(0,2\pi)-\{\pi\}$ which satisfy $2\cot^2\theta-\frac{5}{\sin\theta}+4=0$ then $\int_{\theta_1}^{\theta_2}\cos^2 3\theta\, d\theta=$	P	$\frac{\pi}{2}$
B	$\frac{1}{2}\cdot\int_0^{2\pi}\frac{x\sin^8 x}{\sin^8 x+\cos^8 x}dx=$	Q	π^2
C	$\int_{-\pi}^{\pi}\lvert\pi-\lvert x\rvert\rvert dx=$	R	$\frac{\pi^2}{2}$
D	$\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}}\frac{1}{1+e^{\sin x}}dx=$	S	$\frac{\pi}{6}$
		T	$\frac{\pi}{3}$

1) $A\to S,B\to Q,C\to R,D\to T$ 2) $A\to T,B\to R,C\to Q,D\to P$

3) $A\to T,B\to R,C\to Q,D\to S$ 4) $A\to P,B\to Q,C\to R,D\to S$

8. If $n.(2n+1).\int_0^1 \left(1-x^n\right)^{2n} dx = 1177.\int_0^1 \left(1-x^n\right)^{2n+1} dx \ (n \in N)$ then sum of divisors of 'n' is

1) 24 2) 60 3) 59 4) 120

9. For $0<c<1$, the value of the integral $\int_0^{\pi} \frac{dx}{1-2c\cos x+c^2} =$

1) $\frac{\pi}{1+c^2}$ 2) $\frac{\pi^2}{1+c^2}$ 3) $\frac{\pi}{1-c^2}$ 4) $\frac{\pi^2}{\pi+c^2}$

10. If (a,b) be the ortho-centre of triangle whose vertices are $(1,2),(2,3),(3,1)$ and $I_1 = \int_a^b x\sin\left(4x-x^2\right)dx$, $I_2 = \int_a^b \sin\left(4x-x^2\right)dx$ then $18.\left(\frac{I_1}{I_2}\right) =$

1) 72 2) 88 3) 54 4) 36

11. The value of $\lim_{n\to\infty} 8.\sum_{k=1}^{n} \frac{n^3}{\left(n^2+k^2\right)\left(n^2+3k^2\right)}$ is

1) $\frac{13\pi}{8\left(4\sqrt{3}+3\right)}$ 2) $\frac{13\pi}{4\sqrt{3}+3}$ 3) $13\left(2\sqrt{3}-3\right)$ 4) $\frac{\pi}{2\sqrt{3}+3}$

12. Let 'a' and 'b' be real constants such that the function 'f' is defined by $f(x) = \begin{cases} x^2+3x+a & x\le 1 \\ bx+2 & x>1 \end{cases}$ be differentiable on $\mathbb{R}$ then $3+\int_{-2}^{2} f(x)\,dx =$

1) 17 2) 20 3) $\frac{11}{3}$ 4) $\frac{37}{6}$

13. Let $y=f(x)$ be a twice differentiable function in $(-5,5)$. Let the tangents to the curve $y=f(x)$ at $(1,f(1))$ and $(3,f(3))$ make angles $\frac{\pi}{6},\frac{\pi}{4}$ respectively with positive X-axis, then $\int_1^3 \left(\left(f'(t)\right)^2+1\right)\cdot f''(t)dt =$

1) $\frac{12\sqrt{3}+10}{9\sqrt{3}}$ 2) $\frac{36-10\sqrt{3}}{27}$ 3) $\frac{36-10\sqrt{3}}{9\sqrt{3}}$ 4) $\frac{10-36\sqrt{3}}{27}$

14. Let $f:\mathbb{R}\to\mathbb{R}$ be a function defined by $f(x)=\dfrac{4^x}{4^x+2}$ and

$M=\displaystyle\int_{f(a)}^{f(1-a)} x\,\sin^4\left(x(1-x)\right)dx, N=\int_{f(a)}^{f(1-a)}\sin^4\left(x(1-x)\right)dx, \left(a\neq\frac{1}{2}\right)$, then $\dfrac{M}{N}=$

1) 2 2) $\frac{1}{3}$ 3) 3 4) $\frac{1}{2}$

15. The value of $\displaystyle\int_1^5 f(x)dx$ (where $f(x)=|x-1|+|x-2|+|x-3|$) is

1) 30 2) 15 3) 17 4) 3

16. The slope of the tangent to the curve $y=y(x)=\displaystyle\int_{\sin^{-1}x}^{\cos^{-1}x}\sqrt{1+4\sin^2 t}\;dt, (0\le x\le 1)$ at the point $\left(\dfrac{1}{\sqrt{2}},0\right)$ on the curve is

1) $4\sqrt{3}$ 2) $-2\sqrt{6}$ 3) $2\sqrt{6}$ 4) $-4\sqrt{3}$

17. Let $[t]$ is greatest integer function $\le t$, then $10-10\displaystyle\int_{-2}^{2}\left[x+x^3\right]dx=$

1) -2 2) -10 3) 30 4) -30

18. Let the function $f:[0,2]\to R$ be defined as $f(x)=\begin{cases} e^{\min\left\{x^2,x-[x]\right\}} & x\in[0,1) \\ e^{[x-\log_{10}x]} & x\in[1,2]\end{cases}$, then

$\displaystyle\int_0^2 x f(x)dx+1=$ ($[x]$ is greatest integer function $\le x$)

1) $2e-\frac{1}{2}$ 2) $2+\frac{3e}{2}$ 3) $2e+\frac{1}{2}$ 4) $e\left(e^2+\frac{1}{2}\right)$

19. Let 'f' be a real valued continuous function on $[0,1]$ and $f(x)=x+\int_0^1 (x-t).f(t)\,dt$.

Then which of the following points (x,y) lies on the curve $y=f(x)$

1) $(2,4)$ 2) $(1,2)$ 3) $(4,17)$ 4) $(6,8)$

20. Let $f:\mathbb{R}\to\mathbb{R}$ be continuous function satisfying $f(x)+f(x+k)=n$ for all $x\in\mathbb{R}$

where $k>0$, n is a positive integer. If

$I_1=\int_0^{4nk} f(x)dx, I_2=\int_{-k}^{3k} f(x)dx$ then

1) $I_1+2I_2=4nk$ 2) $I_1+2I_2=2nk$ 3) $I_1+nI_2=4n^2k$ 4) $I_1+nI_2=6n^2k$

SECTION-II (NUMERICAL VALUE TYPE)

This section contains **5 Numerical Value Type Questions.** The Answer should be within **0 to 9999.** If the Answer is in **Decimal** then round off to the **Nearest Integer** value (Example i,e. If answer is above **10** and less than **10.5** round off is **10** and If answer is from **10.5** and less than **11** round off is **11).**

Marking scheme: +4 for correct answer, 0 if not attempt and -1 in all other cases.

21. Let 'α' and 'β' be real numbers such that $\lim_{x\to 0}\frac{1}{x^3}\left(\frac{\alpha}{2}\int_0^x \frac{1}{1-t^2}dt+\beta x\cos x\right)=2$ then the value of $5(\alpha+\beta)$ is

22. If $L=\int_{\frac{1}{2}}^{2}\frac{\tan^{-1}x}{2x^2-3x+2}dx$ then value of $\frac{\tan\left(\frac{2L\sqrt{7}}{\pi}\right)}{\sqrt{7}}$ is ____ (Here inverse trigonometric function $\tan^{-1}x$ assumes values in $\left(\frac{-\pi}{2},\frac{\pi}{2}\right)$)

23. Let $f:(0,\infty)\to\mathbb{R}$ and $F(x)=\int_0^x t.f(t)dt, F(x^2)=x^4+x^5$ then $\sum_{r=1}^{16} f(r^2)=$__

24. Let the domain of the function $f(x)=\log_2\left(\log_4\left(\log_6\left(3+4x-x^2\right)\right)\right)$ be (α,β). If

$$\int_0^{\beta-\alpha}\left[x^2\right]dx=p-\sqrt{q}-\sqrt{r}, p,q,r\in N, \text{ g.c.d of } (p,q,r)=1,$$

($[x]$ is greatest integer function $\le x$), then $p+q+r$ is

25. Let $f(x)=7\tan^8 x+7\tan^6 x-3\tan^4 x-3\tan^2 x$, $I_1=\int_0^{\frac{\pi}{4}} f(x)dx, I_2=\int_0^{\frac{\pi}{4}} x\, f(x)dx$ then

$2025\, I_1+24312\, I_2=$

PHYSICS **Max Marks: 100**

SECTION-I (SINGLE CORRECT ANSWER TYPE)

This section contains **20 Multiple Choice Questions.** Each question has 4 options (1), (2), (3) and (4) for its answer, out of which ONLY ONE option can be correct.

Marking scheme: +4 for correct answer, 0 if not attempted and –1 in all other cases.

26. Statement I: If three point charges are placed at the corners of an equilateral triangle, then the system can never be in equilibrium.

Statement II: the system of three point charges lying on a straight line can be in equilibrium

1) Statement I is true and Statement II is false
2) Statement I is false and Statement II is true
3) Both the statements are true
4) Both the statement are false

27. Assertion (A): Inside a satellite orbiting very close to the earth's surface, water does not fall out of a glass when it is inverted.

Reason (R): The reaction force of glass on the water balances Earth's gravitational force on the water.

1) Both A and R are true, R is the correct explanation of A
2) Both A and R are true, R is not the correct explanation of A
3) A is true, but R is false
4) A is false, But R is true

28. Statement I: The escape velocity for a planet at a point is V_e. A body is projected at that point horizontally with a speed V. This particle moves as satellite around the planet for any value of V satisfies the condition $\frac{V_e}{4} < V < V_e$

Statement Ii: The escape velocity of body at any point is always equal to $\sqrt{2}$ times to orbital velocity at that point in planets gravitational field.

1) Statement I is true but statement II is false
2) Statement I is false, but Statement II is true
3) Both the statements are true
4) Both the statement are false

29. Two positively charged particles X and Y of equal mass m are initially far away from each other and at rest. X begins to move towards Y with some initial velocity u.
The total linear momentum and energy of the system are P and E.
Read the following statements and choose the correct option.
A) If Y is fixed, E is conserved but not P
B) If Y is fixed, P is conserved but not E
C) If Y is free to move, finally X will stop and Y will move with velocity u
D) If Y is free to move, the maximum electrostatic potential energy of the system is $\frac{mu^2}{4}$

1) A, C are only true
2) B, D are only true
3) A, C, D only are true
4) A, B, C, D all are true

30. A planet of mass M has two natural satellites with masses m_1 and m_2 the radii of their circular orbits are R_1 and R_2 respectively. Ignore the gravitational force between the satellites. Define V_1, L_1, U_1 and T_1 to be respectively, the escape velocity, angular momentum, potential energy and time period of revolution of satellite -1 and V_2, L_2, U_2 and T_2 to be the corresponding quantities of satellite-2.

Given $\frac{m_1}{m_2}=3$ and $\frac{R_1}{R_2}=\frac{1}{9}$. Match the ratios in List-I to the numbers in List-II.

List-I		List-II	
P	$\frac{V_1}{V_2}$	I	3
Q	$\frac{L_1}{L_2}$	II	$\frac{1}{27}$
R	$\frac{U_1}{U_2}$	III	1
S	$\frac{T_1}{T_2}$	IV	27

1) $P-II, Q-III, R-I, S-II$
2) $P-I, Q-III, R-IV, S-II$
3) $P-I, Q-IV, R-III, S-II$
4) $P-III, Q-IV, R-I, S-II$

31. Two spherical planets P and Q have the same uniform density and have surface area A and 4A respectively. Given V_P and V_Q are the escape velocities from the planets P and Q then

1) $\frac{V_P}{V_Q}=\frac{1}{2}$ 2) $\frac{V_P}{V_Q}=2$ 3) $\frac{V_P}{V_Q}=1$ 4) $\frac{V_P}{V_Q}=\frac{1}{3}$

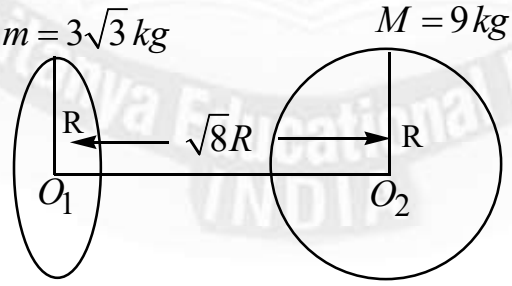
32. Two satellites A and B are moving in different circular orbits around the Earth of radius R. The heights of A and B from the Earth's surface are $\frac{R}{3}$ and $\frac{3R}{5}$. The ratio of acceleration of A and B is

1) 16:25 2) 25:36 3) 25:16 4) 36:25

33. Two starts of masses $3\times10^{31}kg$ each and at a distance $4\times10^{11}m$ rotate in a plane about their common centre of mass O. A meteorite passes through O moving perpendicular to the plane of star's rotation. In order to escape from the gravitational field of this double star system the minimum speed that meteorite should have at O is. Take $G=6.67\times10^{-11}Nm^2kg^{-2}$

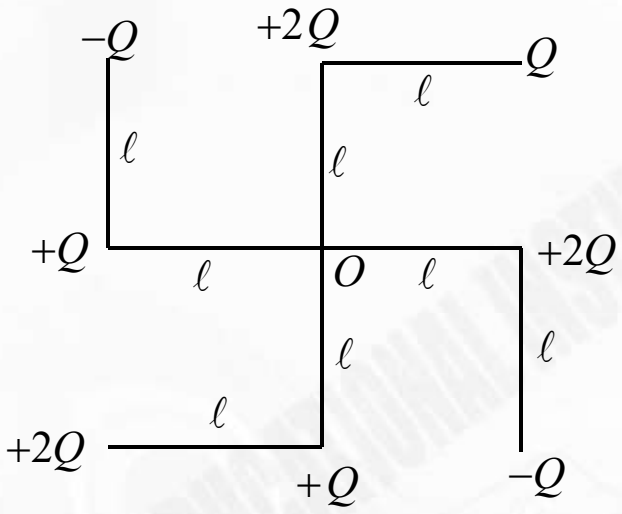
1) 300 km/s 2) 400 km/s 3) 200 km/s 4) 250 km/s

34. Find the gravitational force of attraction between the ring and sphere as shown is the figure where the plane of ring is perpendicular to the line joining the centres of ring and sphere. (G = universal gravitational constant and $R=1m$)



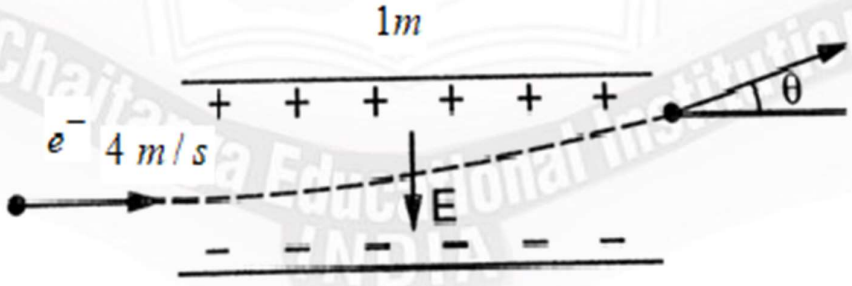
1) 10 G 2) 16 G 3) $\sqrt{12}G$ 4) $\sqrt{24}G$

35. Find the magnitude of electric field at point O due to the group of point charges as shown in fig. Each side of the figure is ℓ perpendicular to each other. (Given $K = \frac{1}{4\pi\varepsilon_0}$)



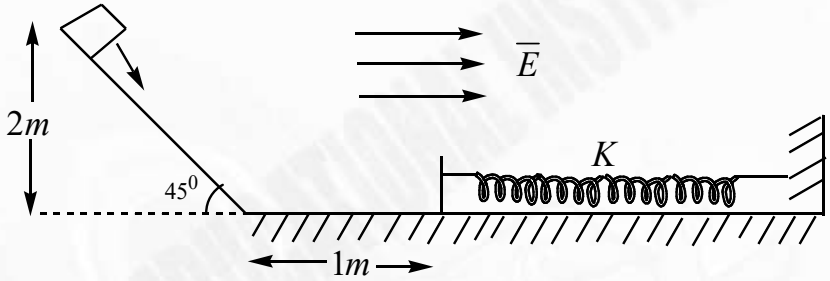
1) $\frac{KQ}{\ell^2}$ 2) $\frac{KQ}{4\ell^2}$ 3) $\frac{KQ}{2\ell^2}\left(2\sqrt{2}-1\right)$ 4) $\sqrt{2}\frac{KQ}{\ell^2}$

36. A uniform electronic filed E is created between two parallel plates of length 1 metre as shown in fig. An electron of mass m, charge e enters the field symmetrically between the plates with a speed of $4ms^{-1}$. The angle of deviation θ of the path of electron as it comes out of the field is 37^0. The value of E is $\left(in\ NC^{-1}\right)$



1) $\frac{15m}{e}$ 2) $\frac{8m}{e}$ 3) $\frac{10m}{e}$ 4) $\frac{12m}{e}$

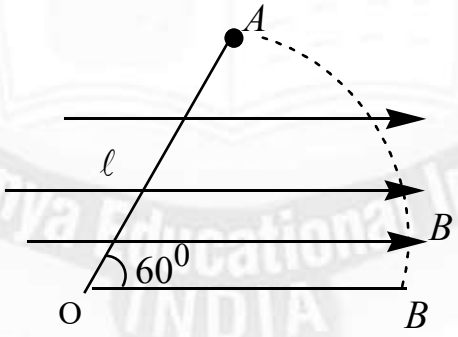
37. A small black of mass 200 g with charge 2C is allowed to slide down from the top of smooth inclined plane in the presence of uniform horizontal electric filed $10\,NC^{-1}$ as shown in fig. The block slides on the horizontal rough floor after reaching the bottom of incline and strikes the free end of an unstrained spring whose other end is rigidly fixed as shown. The coefficient of friction is 0.5 and the spring constant is $400\,Nm^{-1}$. The free end of spring is initially at distance 1m from the bottom of incline. If the maximum compression of spring is x (in metres), then (Assume electric field is present during the entire motion and $g = 10\ ms^{-2}$)



1) $200x^2 - 16x + 79 = 0$ 2) $200x^2 - 19x - 63 = 0$

3) $100x^2 - 19x + 52 = 0$ 4) $100x^2 - 13x + 79 = 0$

38. A particle of mass m and charge q is fastened to one end of a string of length ℓ. The other end of the string is fixed to the point O. The whole system lies on frictionless horizontal plane. Initially the particle is at rest at A. Now an uniform electric field E in the direction shown is switched on, then the tension in the string when the particle is at B is

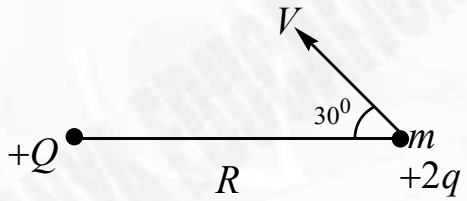


1) zero 2) Eq 3) $2Eq$ 4) $\frac{Eq}{2}$

39. A uniform electric field exists in XY-plane. The potential at points $A(2m,2m), B(-2m,2m)$ and $C(2m,4m)$ are 4V, 16V, 12V respectively. The electric field is $\left(in\ Vm^{-1}\right)$

1) $4\hat{i}+5\hat{j}$ 2) $3\hat{i}+4\hat{j}$ 3) $-3\hat{i}-4\hat{j}$ 4) $3\hat{i}-4\hat{j}$

40. In the diagram shown the charge +Q is fixed. A particle of charge +2q and mass m is projected at a distance R from the fixed charge. Find the least separation between the two charges, if the velocity of particle becomes $\frac{1}{\sqrt{3}}$ times of the projected velocity at this seperation is (Assume gravity is absent)



1) $\frac{R}{\sqrt{3}}$ 2) $\frac{\sqrt{3}R}{2}$ 3) $\frac{R}{2}$ 4) $\frac{R}{2\sqrt{3}}$

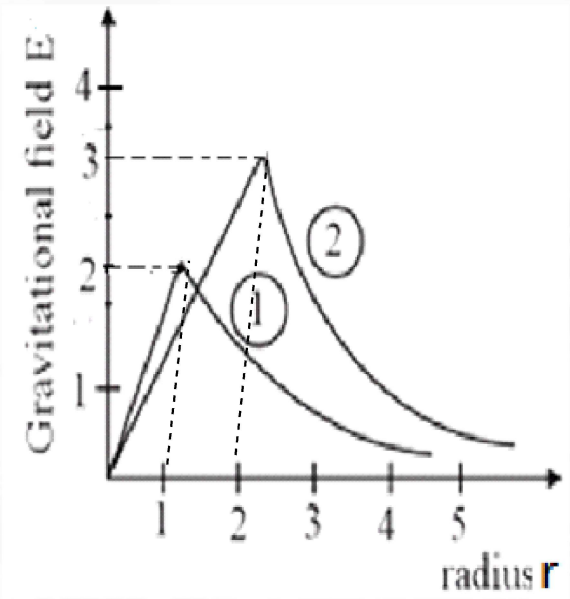
41. A metal wire of uniform mass density having length L and mass M is bent to semicircular arc. The ratio of the magnitude of gravitational field intensity to gravitational potential at the centre of arc is

1) $\frac{1}{\sqrt{2}L}$ 2) $\frac{2}{3L}$ 3) $\frac{2}{L}$ 4) $\frac{1}{L}$

42. A rock is moving around Earth in an circular orbit with speed V. The rock exploded in to two equal pieces in its orbit due to internal forces. If the velocity of one piece is zero just after the explosion, then the velocity of second piece just after explosion and its velocity at infinite distance from Earth are respectively

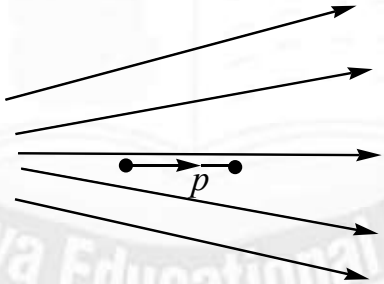
1) $2V,\sqrt{2}V$ 2) $\sqrt{2}V,V$ 3) $3V,V$ 4) 2V, zero

43. The plots gravitational field E versus distance 'r' from the centre are shown below for two uniform solid spheres of unequal mass. The ratio of gravitational potential on the surface of sphere -1 to that on sphere -2 is



1) $\frac{1}{6}$ 2) $\frac{1}{3}$ 3) $\frac{1}{4}$ 4) $\frac{1}{2}$

44. Figure shows electric field lines in which an electric dipole of dipole moment p is placed as shown and left free to move. The correct statement is



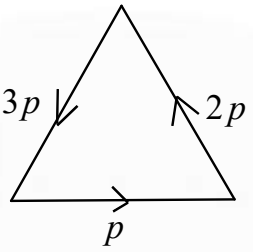
1) Net force on dipole is zero

2) Net force on dipole acts towards left

3) Net force on dipole acts towards right

4) Dipole rotates at the position shown

45. Three electric dipoles of dipole moment p, 2p and 3p are placed along the sides of an equilateral triangle as shown in fig. the net dipole moment is



1) zero 2) 6p 3) $\sqrt{2}p$ 4) $\sqrt{3}p$

SECTION-II (NUMERICAL VALUE TYPE)

This section contains **5 Numerical Value Type Questions.** The Answer should be within **0 to 9999.** If the Answer is in **Decimal** then round off to the **Nearest Integer** value (Example i,e. If answer is above **10** and less than **10.5** round off is **10** and If answer is from **10.5** and less than **11** round off is **11).**

Marking scheme: +4 for correct answer, 0 if not attempt and -1 in all other cases

46. A proton is moved in xy-plane along a straight line $2x+3y=1$ inside uniform electric field $\left(2\hat{i}+3\hat{j}+\hat{k}\right)NC^{-1}$ which is also existing in that region. Find the work done by electric field on proton when moved from the point $\left(\frac{1}{2}m,0\right)$ to $\left(0,\frac{1}{3}m\right)$. (Given the charge of proton = $1.6\times10^{-19}C$).

47. A geostationary satellite is orbiting around the Earth. Assume that if the motion of satellite is reversed in that orbit, then its orbital time period would become___(in hours)

48. A person brought a stationary object of mass 10 kg from a point at outside of gravitational field to a point inside field where the gravitational potential is $-4J\ kg^{-1}$. Assuming all other forces are absent except gravity, the minimum work done by person is (-10 p) joules then $p=$____

49. A light planet is revolving around a massive star in a circular orbit of radius R with a period of revolution T. If the force of attraction between planet and star is proportional to $R^{\frac{-3}{2}}$, then $T^2\propto R^{\frac{N}{2}}$. The value of $N=$____

50. If the angular speed of self rotation of earth is increased to N times to that present value, the weight of body at equator will become zero. The value of $N=$ (approx) take $g=10ms^{-2}$ at the poles and radius of the Earth =6400km.

CHEMISTRY

Max Marks: 100

SECTION-I (SINGLE CORRECT ANSWER TYPE)

This section contains **20 Multiple Choice Questions.** Each question has 4 options (1), (2), (3) and (4) for its answer, out of which ONLY ONE option can be correct.

Marking scheme: +4 for correct answer, 0 if not attempted and –1 in all other cases.

51. Acetophenone is

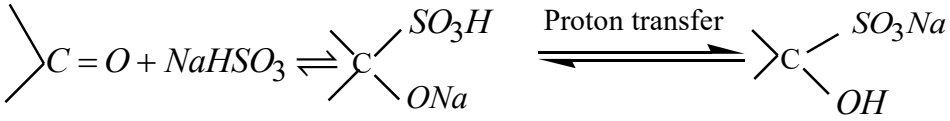
1) Alkyl & aryl groups are attached to keto group
2) It does not give cannizzaro reaction
3) It gives aldol condensation and halo form test
4) All

52. Match the following

1	hexan-1-ol to hexanal	a	$K_2Cr_2O_7$ in acidic medium
2	Cyclohexanol to cyclohexanone	b	$C_5H_5NH^+CrO_3C\ell^-[PCC]$
3	p-fluorotoluene to p-fluoro benzaldehyde	c	CrO_3 in presence of acetic anhydride & H_3O^+
4	ethanenitrile to ethanal	d	$DIBAL-H$ & H_2O

1) $1-b,2-a,3-c,4-d$ 2) $1-c,2-d,3-a,4-b$
3) $1-b,2-a,3-d,4-c$ 4) $1-b,2-d,3-a,4-c$

53. **Statement-I:**



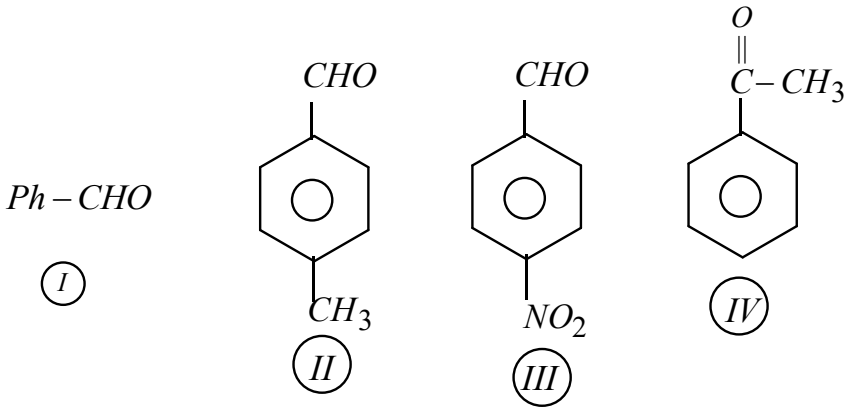
Statement –II: The position of the equilibrium lies largely to the right hand side for most aldehydes and to the left for most ketone due to steric reasons.

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

54. Arrange the following compounds is the correct order of their boiling points.

I) $CH_3-CH_2-CH_3$ II) CH_3-O-CH_3
III) CH_3-CHO IV) CH_3-CH_2-OH
1) $IV<III<II<I$ 2) $I<II<III<IV$
3) $III>IV>II>I$ 4) $II>III>IV>I$

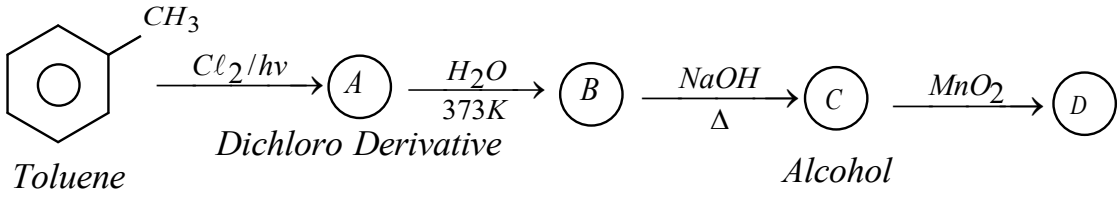
55. Arrange the following compounds the correct order of their reactivity in Nucleophilic addition reactions.



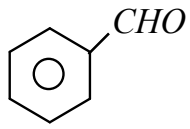
1) $IV > I > II > III$ 2) $II > I > IV > III$

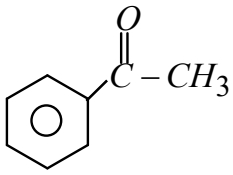
3) $III > I > II > IV$ 4) $III < I < II < IV$

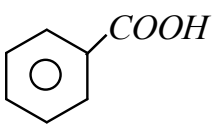
56.

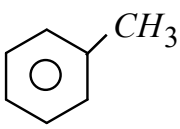


Then find "D"

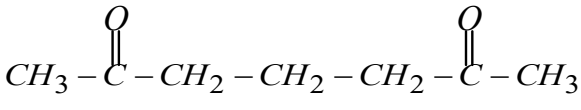
1) 

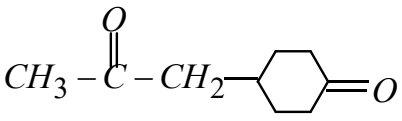
2) 

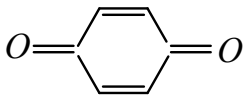
3) 

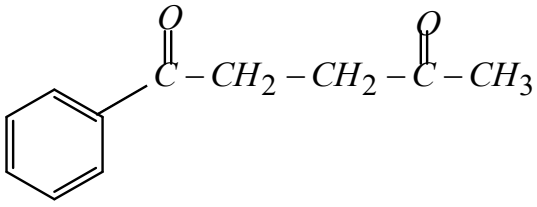
4) 

57. Which of the following is an example of conjugated diketone

1) 

2) 

3) 

4) 

58.

$$R-X \xrightarrow[II)H_2O]{I)DIBAL-H} R-CHO$$

Consider the above reaction and identify "X"

1) $-CONH_2$ 2) $-COOC_2H_5$ 3) $-COOH$ 4) $-CH_2-NH_2$

59. **Statement-I:-** Aldehydes and ketones react with hydrogen cyanide (HCN) to yield cyanohydrins.

Statement-II:- This reaction occurs very fast with pure HCN

Choose the most appropriate answer from the option given below

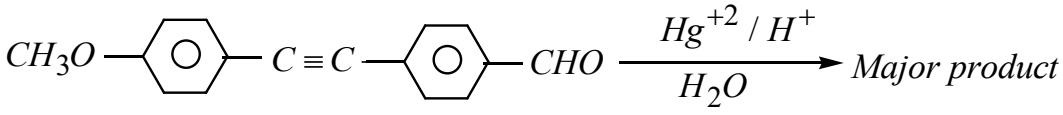
1) Statement-I is correct and Statement-II is incorrect

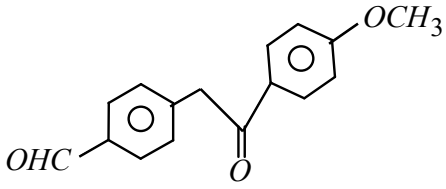
2) Both Statement-I and Statement-II are incorrect

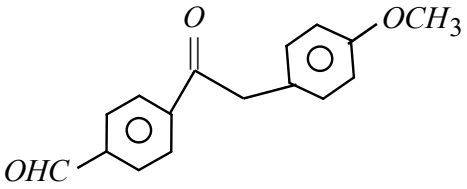
3) Both Statement-I & statement-II are correct

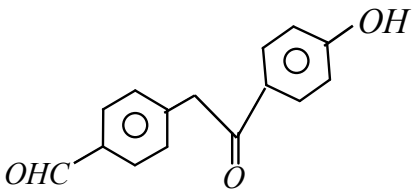
4) Statement I is incorrect & statement-II is correct

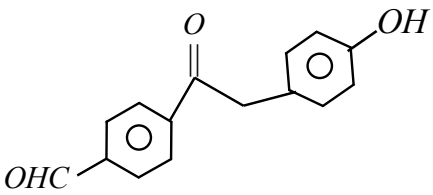
60. The major product obtained from the following reaction is



1) 

2) 

3) 

4) 

61. **Assertion(A):** Benzaldehyde undergoes Cannizzaro reaction with conc- $NaOH$

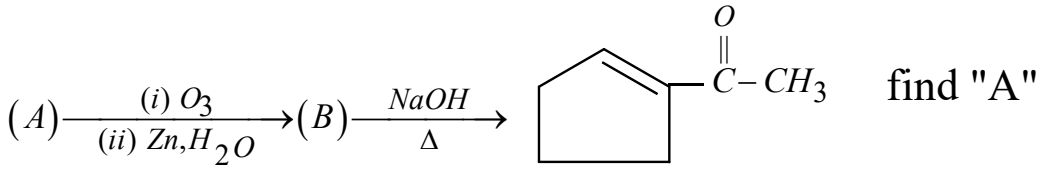
Reason(R): Cannizzaro reaction is a disproportionation reaction

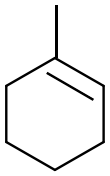
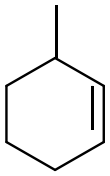
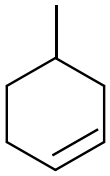
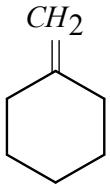
1) Both (A) and (R) are true and (R) is the correct explanation of (A)

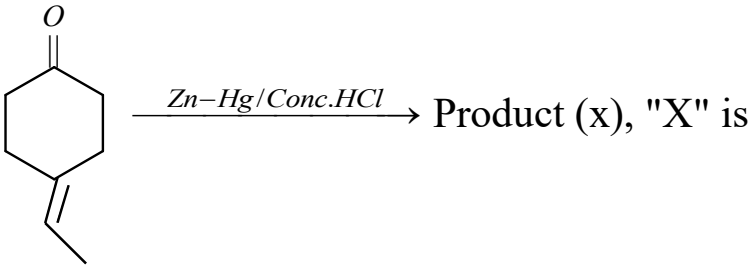
2) Both (A) and (R) are true and (R) is the not correct explanation of (A)

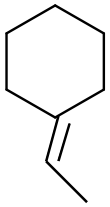
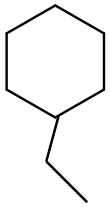
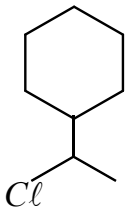
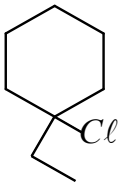
3) (A) is true but (R) is false

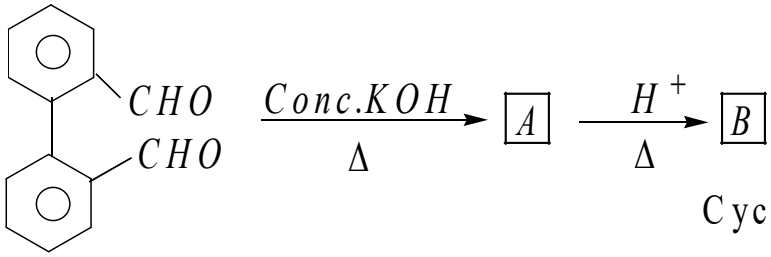
4) If (A) false and (R) is true

62.  find "A"

1) 
2) 
3) 
4) 

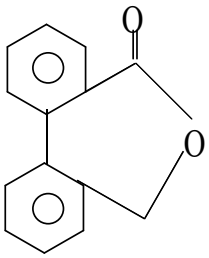
63.  Product (x), "X" is

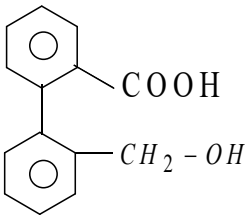
1) 
2) 
3) 
4) 

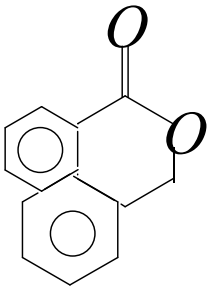
64. 

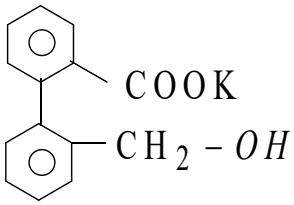
Cyclic Product

Structure of "B" is

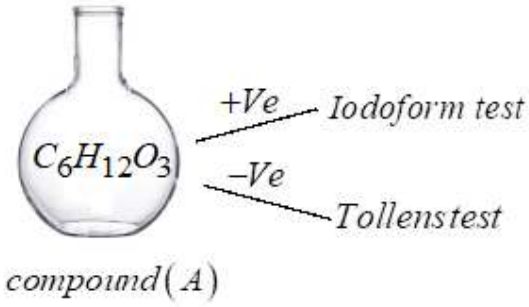
1) 

2) 

3) 

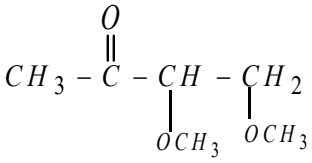
4) 

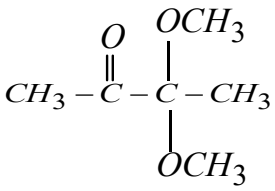
65. **Assertion(A):** Benzaldehyde to be less reactive in nucleophilic addition reactions than propanal.
Reason(R): The carbon atom of the carbonyl group of benzaldehyde is less electrophilic than carbon atom of the carbonyl group present in propanal.
1) Both (A) and(R) are true and (R) is the correct explanation of (A)
2) Both (A) and(R) are true and (R) is the not correct explanation of (A)
3) (A) is true but (R) is false
4) If (A) false and (R) is true

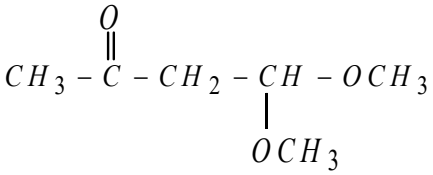
66. 

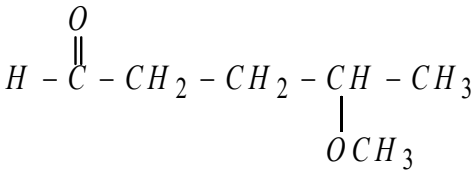
$$A \xrightarrow[\text{drop Of } H_2SO_4]{H_2O} +Ve \text{ Tollens test}$$

Compound A is _____

1) 

2) 

3) 

4) 

67. Which compound is oxidized to prepare ethyl methyl ketone

1) 2-Propanol 2) 1-Butanol 3) 2-Butanol 4) $2-methylpropan-2-ol$

68. C_2H_5CHO & $Ph-CHO$ can be distinguished by testing with

1) Phenyl hydrazine 2) Hydroxylamine

3) Fehling's solution 4) Tollen's solution

69. An organic compound contains 69.77% Carbon, 11.63% hydrogen and rest oxygen. The molecular mass of the compound is 86. It does not reduce Tollen's reagent but forms sodium hydrogen sulphite adduct and gives +Ve iodo form test. On Vigorous oxidation forms ethanoic and propanoic acids. The organic compound is

1) 2-Pentanone 2) 3-Pentanone 3) Pentanal 4) 2-pentanol

70.

$$C_6H_6 \xrightarrow[Anhy,AlCl_3]{CO,HCl} "X" \underset{Product}{}$$

Find incorrect match of given reaction

1) "X" is $ph-COCl$

2) "X" is benzene carbaldehyde

3) "X" has seven sp^2 hybridised carbons

4) This reaction is known as Gattermann Koch reaction

SECTION-II (NUMERICAL VALUE TYPE)

This section contains **5 Numerical Value Type Questions.** The Answer should be within **0 to 9999.** If the Answer is in **Decimal** then round off to the **Nearest Integer** value (Example i,e. If answer is above **10** and less than **10.5** round off is **10** and If answer is from **10.5** and less than **11** round off is **11).**

Marking scheme: +4 for correct answer, 0 if not attempt and -1 in all other cases

71.

$$R-\overset{\overset{O}{\|}}{C}-CH_3 \xrightarrow{NaOBr} R-\overset{\overset{O}{\|}}{C}-ONa + \boxed{A}$$

molecular weight of 'A' is _____

72. An organic compound (A) with Moleculer formula C_8H_8O forms an orange-red precipitate with 2, 4-DNP reagent and gives yellow precipate on heating with iodine in the presence of sodium hydroxide. It neither reduces Tollen's (or) Fehlings reagent. Nor does it decolourise bromine water or Baeyer's reagent. On drastic oxidation with chromic acid it gives carboxylic acid (B) having molecular formula $C_7H_6O_2$. Total number of $\pi-$ bonds in A & B are_____

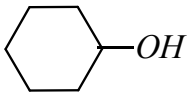
73. R-CHO + Tollens Reagent $\rightarrow$ salt of carboxylate + Silver ppt

In this Reaction Silver oxidation state change is "x". Then "x" is_____

74.

$$\begin{matrix} Ethanaldehyde \\ + \\ Propanaldehyde \end{matrix} \xrightarrow[(2)\Delta]{(1)\,NaOH}$$ Number of products are _____ (excluding stereo isomers)

75.



$$\xrightarrow[\begin{matrix}(ii)\,C_6H_5MgBr \\ (iii)\,H_2O \\ (iv)\,H^+/\Delta\end{matrix}]{(i)\,K_2Cr_2O_7/H^+}$$ Product (x)

Number of sp^2 hybridized carbons in "X" is _____

Sri Chaitanya Educational Institutions | Infinity Learn

Sri Chaitanya Techno School
The right mentor for IIT (JEE), NEET, Olympiad & all Other Competitive exams

40 Years of Excellence 1986-2025

JEE MAIN 2025

31 STUDENTS BELOW 100 AIR

VANGALA AJAY REDDY
APP. NO. 250302555192
CLASSROOM STUDENT FROM GRADE IX - XII

DEVDUTTA MAJHI
APP. NO. 250310016185
DLP/AITS STUDENT

TOSHNIWAL SHIVEN
APP. NO. 250310391420
DLP/AITS STUDENT

SAKSHAM JINDAL
APP. NO. 250310236696
DLP/AITS STUDENT

BELOW 100 ALL INDIA OPEN CATEGORY RANKS	BELOW 500 ALL INDIA OPEN CATEGORY RANKS	BELOW 10 ALL INDIA CATEGORY RANKS COUNT	BELOW 100 ALL INDIA CATEGORY RANKS COUNT	BELOW 1000 ALL INDIA CATEGORY RANKS COUNT
31	95	10	98	579

TOTAL QUALIFIED RANKS FOR JEE ADVANCED-2025 22,094

*DLP/AITS

JEE 2025 STARS SHINE BRIGHT

Sri Chaitanya Tops JEE ADVANCED

ALL INDIA OPEN CATEGORY RANKS

RUTVIK SAI
H.T.No. 256055278 (OBC-NCL)

MAJID MUJAHID HUSAIN
H.T.No. 251134112*

UJJWAL KESARI
H.T.No. 252016104*

AKSHAT KUMAR CHAURASIA
H.T.No. 254065055*

BELOW 100 ALL INDIA OPEN CATEGORY RANKS	BELOW 500 ALL INDIA OPEN CATEGORY RANKS	BELOW 1000 ALL INDIA OPEN CATEGORY RANKS	BELOW 1000 ALL INDIA CATEGORY RANKS COUNT
29	113	205	745

NUMBER OF QUALIFIED RANKS 4,212

*DLP/AITS