Resonance®
Educating for better tomorrow

DIVISION: PRE-MEDICAL
Academic session: 2023-24

PERIODIC ASSESSMENT TEST (PAT)

STUDENT SUPPORT BOOKLET (SSB)

Answer Key (AK) | Standard Hints (SH) | Text Solutions (TS) | Weightage Sheet (WS)

CLASS	XI	COURSE NAME	SAKSHAM	COURSE CODE	MA
PHASE CODE(S)	02 MA	TOTAL PAGES	1	BATCH CODE(S)	02 MA

Target Examination & Year:

NEET 2025

TEST PATTERN	TEST TYPE	TEST CODE & SEQUENCE
NEET	PART TEST	PT-3

DATE & DAY:
27th Aug 2023 | Sunday

Duration & Time:
200 Minutes | 11:30 AM to 02:50 PM

Contents:

- Weightage Sheet (WS) ✓
- Answer Key (AK) ✓
- Standard Hints (SH) ☐
- Text Solutions (TS) ✓
- Resonance Student's Critical Analysis of Learning for Excellence (ResoSCALE) ☐
- Student Self Assessment Sheet (SAS) ✓
- Video Solutions (VS) ✓

Scan QR Code for Video Solutions

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

ANSWER KEY (AK)

PAPER											
PART-A : CHEMISTRY	Q.No.	1	2	3	4	5	6	7	8	9	10
	Ans.	2	1	1	1	4	4	1	4	1	1
	Q.No.	11	12	13	14	15	16	17	18	19	20
	Ans.	3	3	2	1	2	1	4	4	1	4
	Q.No.	21	22	23	24	25	26	27	28	29	30
	Ans.	2	2	2	1	2	1	4	1	3	1
	Q.No.	31	32	33	34	35	36	37	38	39	40
	Ans.	1	1	2	1	2	1	1	4	4	2
	Q.No.	41	42	43	44	45	46	47	48	49	50
	Ans.	2	2	4	4	1	3	4	2	3	1
PART-B : PHYSICS	Q.No.	51	52	53	54	55	56	57	58	59	60
	Ans.	3	1	1	3	2	3	4	2	4	3
	Q.No.	61	62	63	64	65	66	67	68	69	70
	Ans.	3	1	2	3	4	1	4	3	2	2
	Q.No.	71	72	73	74	75	76	77	78	79	80
	Ans.	4	4	1	1	3	1	3	2	1	2
	Q.No.	81	82	83	84	85	86	87	88	89	90
	Ans.	2	1	2	4	4	2	1	1	2	1
	Q.No.	91	92	93	94	95	96	97	98	99	100
	Ans.	1	3	1	1	4	1	1	4	1	2
PART-C : BIOLOGY	Q.No.	101	102	103	104	105	106	107	108	109	110
	Ans.	2	4	1	3	3	1	2	4	2	4
	Q.No.	111	112	113	114	115	116	117	118	119	120
	Ans.	3	4	4	2	3	4	1	4	4	4
	Q.No.	121	122	123	124	125	126	127	128	129	130
	Ans.	2	2	3	1	4	2	2	4	1	4
	Q.No.	131	132	133	134	135	136	137	138	139	140
	Ans.	2	2	4	2	2	3	3	3	1	3
	Q.No.	141	142	143	144	145	146	147	148	149	150
	Ans.	1	4	2	2	3	3	2	4	4	1
	Q.No.	151	152	153	154	155	156	157	158	159	160
	Ans.	2	4	2	4	1	4	2	2	4	2
	Q.No.	161	162	163	164	165	166	167	168	169	170
	Ans.	3	1	1	3	3	1	3	4	1	1
	Q.No.	171	172	173	174	175	176	177	178	179	180
	Ans.	2	3	2	2	2	2	3	4	2	2
	Q.No.	181	182	183	184	185	186	187	188	189	190
	Ans.	3	4	4	4	4	3	3	3	1	2
	Q.No.	191	192	193	194	195	196	197	198	199	200
	Ans.	3	1	2	3	1	3	3	1	1	1

STUDENT'S SPACE

TEXT SOLUTIONS (TS)

PAPER

PART-A: CHEMISTRY

2. $[H^+] = 0.016$ M

$[H^+][OH^-] = 10^{-14} \Rightarrow [OH^-]$

$= \dfrac{100\times10^{-16}}{16\times10^{-3}} = 6.25 \times 10^{-13}$ M

3. The reaction in which number of gaseous products (n_p) is equal to number of gaseous reactants, is not affected by change in pressure.

For reaction, $H_2 + I_2 \rightleftharpoons 2HI$

Number of products = 2 ;

Number of reactants = 2

Hence, it is not affected by change in pressure.

5. Refer to answer key

7. $Q_C = \dfrac{\left(\frac{6}{2}\right)^2}{\left(\frac{2}{2}\right)\left(\frac{4}{2}\right)^3} = \dfrac{9}{8}$

$Q_C < K_C$ so reaction will proceed in forward direction.

8. Time can not be calculated by equilibrium constant.

9. A catalyst does not influences the values of equilibrium constant but Catalysts influence the rate of both forward and backward reactions equally.

10. $2Ag_2O_{(s)} \rightleftharpoons 4Ag_{(s)} + O_{2(g)}$ For this reaction

$K_P = P_{O_2}$ (Ag_2O and Ag are in solid state)

Same for both

11. K_p of all gases reactions is not equal to K_c.

It's depends on Δn value.

13. $K_C = \dfrac{[HI]^2}{[H_2]\quad[I_2]}$; $64 = \dfrac{x^2}{0.03 \quad \times 0.03}$

$x^2 = 64 \times 9 \times 10^{-4}$

$x = 8 \times 3 \times 10^{-2} = 0.24$

x is the amount of HI at equilibrium amount of I_2 at equilibrium will be

$0.30 - 0.24 = 0.06$

15. Refer to answer key

16. Refer to answer key

18. Refer to answer key

20. At Constant volume. There is no change in concentration (closed container).

38. From Le-chatelier principle.

39. Refer to answer key

41. K_p will remain same.

44. For given equilibrium,

Increase in temperature causes backward shift in equilibrium.

Adding inert gas at constant pressure causes forward shift in equilibrium.

Doubling the volume of the container causes forward shift in equilibrium.

PART-B: PHYSICS

51. $H = \dfrac{u^2\sin^2\theta}{2g} \therefore H \propto u^2$. If initial velocity be doubled then maximum height reached by the projectile will quadrupled.

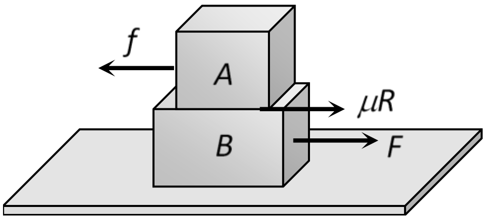
52. Refer to answer key

53. There is no friction between the body B and surface of the table. If the body B is pulled with force F then

$F = (m_A + m_B)a$

Due to this force upper body A will feel the pseudo force in a backward direction.

$f = m_A \times a$



But due to friction between A and B, body will not move. The body A will start moving when pseudo force is more than friction force.

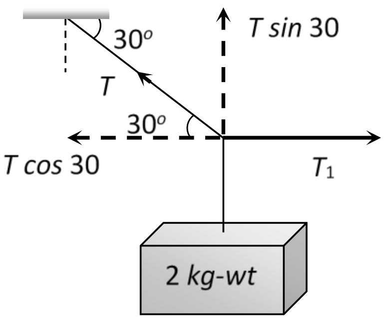
i.e. for slipping, $m_A a = \mu\, m_A g \;\therefore\; a = \mu g$

54. 5N force will not produce any tension in spring without support of other 5N force. So here the tension in the spring will be 5N only.

55. Range is given by $R = \frac{u^2 \sin 2\theta}{g}$

On moon $g_m = \frac{g}{6}$. Hence $R_m = 6R$

56.



$T\sin 30 = 2\text{kgwt}$

$\Rightarrow T = 4\text{kgwt}$

$T_1 = T\cos 30°$

$= 4\cos 30°$

$= 2\sqrt{3}$

57. Refer to answer key

58. $F = m \times a$, If force is constant then $a \propto \frac{1}{m}$.

So If mass is doubled then acceleration becomes half.

59. $\mu_S = \frac{m_B}{m_A} \Rightarrow 0.2 = \frac{m_B}{2} \Rightarrow m_B = 0.4\,\text{kg}$

60. Refer to answer key

61. $\frac{2u\sin\theta}{g} = 2\sec \Rightarrow u\sin\theta = 10$

$\therefore\; H = \frac{u^2\sin^2\theta}{2g} = \frac{100}{2g} = 5\text{m}$

62. Applied force $= 2.5\text{ N}$

Limiting friction

$= \mu mg = 0.4 \times 2 \times 9.8 = 7.84\text{ N}$

For the given condition applied force is very smaller than limiting friction.

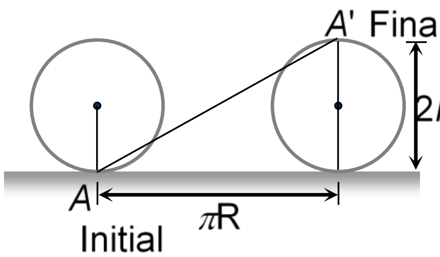
$\therefore$ Static friction on a body

= Applied force = 2.5 N

63. Since downward force along the inclined plane

$= mg\sin\theta = 5 \times 10 \times \sin 30° = 25N$

64. Horizontal distance covered by the wheel in half revolution = πR.



So the displacement of the point which was initially in contact with ground

$= AA' = \sqrt{(\pi R)^2 + (2R)^2}$

$= R\sqrt{\pi^2 + 4} = \sqrt{\pi^2 + 4}$

$(\text{As } R = 1\text{m})$

65. Reading on the spring balance

= m (g – a)

and since a = g

$\therefore$ Force = 0

66. Refer to answer key

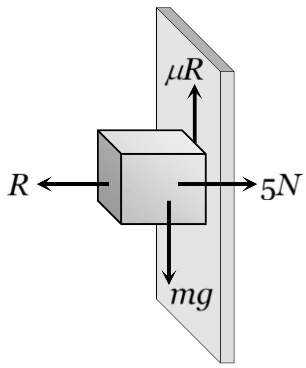
67. We know that a

$= \mu g = 0.2 \times 9.8 = 1.96 \text{ m/s}^2$

68. Refer to answer key

69. Limiting friction $F_l = \mu_s R = 0.5 \times (5) = 2.5 \text{ N}$

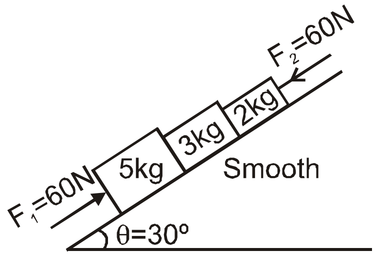
Since downward force is less than limiting friction therefore block is at rest so the static force of friction will work on it.



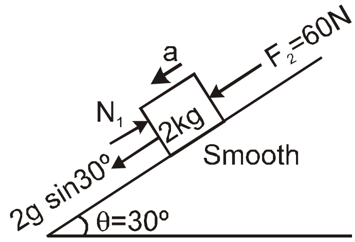
F_s = downward force = Weight

$= 0.1 \times 9.8 = 0.98 \text{ N}$

70.

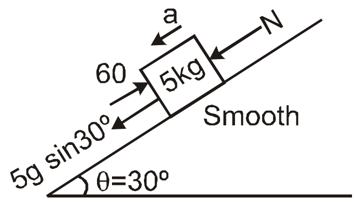


$a_{system} = \dfrac{(5+3+2)g\sin 30^\circ}{10} = 5 \text{ m/s}^2$



$60 + 10 - N_1 = 2 \times 5$

$N_1 = 60$ N



$N_2 + 25 - 60 = 25$

$N_2 = 60$ N.

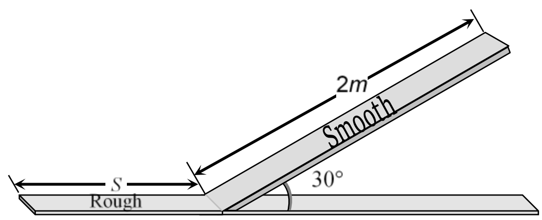
71. Net downward force = Weight – Friction

$\therefore \; ma = 25 \times 9.8 - 2$

$\Rightarrow \; a = \dfrac{25 \times 9.8 - 2}{25} = 9.72 \text{ m/s}^2$

72. $T = \dfrac{2 \times m_B m_C}{m_A + m_B + m_C} \times g = \dfrac{2 \times 1 \times 5}{3+1+5} \times g = \dfrac{10}{9} g.$

73.



$v^2 = u^2 + 2as = 0 + 2 \times g\sin 30 \times 2$

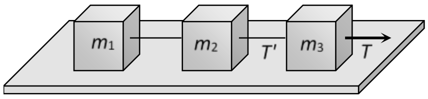
$\Rightarrow \; v = \sqrt{20}$

Let it travel distance 'S' before coming to rest

$S = \dfrac{v^2}{2\mu g} = \dfrac{20}{2 \times 0.25 \times 10} = 4\text{m}$

74. $\mu = \tan\theta\left(1-\frac{1}{n^2}\right) = \tan 30\left(1-\frac{1}{2^2}\right) = \frac{\sqrt{3}}{4}$

75.



$T' = (m_1 + m_2) \times \frac{T}{m_1 + m_2 + m_3}$

76. Angle of repose

$\alpha = \tan^{-1}(\mu) = \tan^{-1}(0.8) = 38.6^\circ$

Angle of inclined plane is given $\theta = 30^\circ$. It means block is at rest therefore,

Static friction = component of weight in downward direction $= mg\sin\theta = 10\,N$ $\therefore$

$m = \frac{10}{9 \times \sin 30^\circ} = 2\ kg$

77. Rate of change of momentum of the bullet in forward direction

= Force required to hold the gun.

$F = nmv = 4 \times 20 \times 10^{-3} \times 300 = 24N$

78. From the relation $F - \mu mg = ma$

$a = \frac{F - \mu mg}{m} = \frac{129.4 - 0.3 \times 10 \times 9.8}{10} = 10\,m/s^2$

79. $F = u\left(\frac{dm}{dt}\right) \Rightarrow \frac{dm}{dt} = \frac{F}{u} = \frac{210}{300} = 0.7\ kg/s$

80. $a = \frac{\text{Applied force} - \text{Kinetic friction}}{\text{mass}}$

$= \frac{100 - 0.5 \times 10 \times 10}{10} = 5m/s^2$

81. $S = \frac{u^2}{2\mu g} = \frac{(10)^2}{2 \times 0.2 \times 10} = 25\,m$

82. An aeroplane flies 400 m north and 300 m south so the net displacement is 100 m towards north.

Then it flies 1200 m upward so

$r = \sqrt{(100)^2 + (1200)^2}$

$= 1204m \simeq 1200m$

The option should be 1204 m, because this value mislead one into thinking that net displacement is in upward direction only.

83. $s = \frac{u^2}{2\mu g} = \frac{(20)^2}{2 \times 0.5 \times 10} = 40\,m$

84. Limiting friction

$= \mu_s R = \mu_s mg = 0.5 \times 60 \times 10 = 300\,N$

Kinetic friction

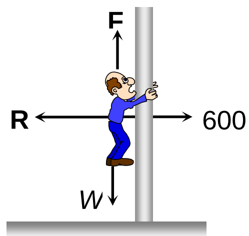
$= \mu_k R = \mu_k mg = 0.4 \times 60 \times 10 = 240\,N$

Force applied on the body = 300 N and if the body is moving then, Net accelerating force

=Applied force – Kinetic friction

$\Rightarrow ma = 300 - 240 = 60$ $\therefore$ $a = \frac{60}{60} = 1\,m/s^2$

85. Net downward acceleration



$= \frac{\text{Weight} - \text{Friction force}}{\text{Mass}}$

$= \frac{(mg - \mu R)}{m}$

$= \frac{60 \times 10 - 0.5 \times 600}{60}$

$= \frac{300}{60} = 5\ m/s^2$

86. The apparent weight of man,

$R = m(g + a) = 80(10 + 6) = 1280N$

87. Limiting friction $F_l = \mu\ mg\cos\theta$

$F_l = 0.7 \times 2 \times 10 \times \cos 30^\circ = 12\ N$

(approximately)

But when the block is lying on the inclined plane then component of weight down the plane $= mg\sin\theta$

$= 2 \times 9.8 \times \sin 30^\circ = 9.8\ N$

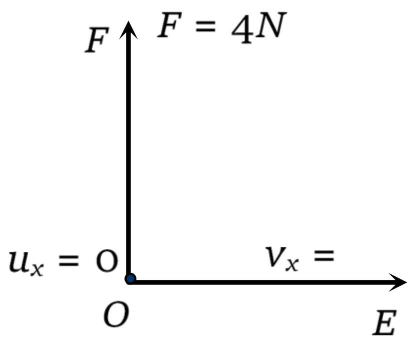
It means the body is stationary, so static friction will work on it

$\therefore$ Static friction = Applied force = 9.8 N

88. $S = kt^3$ $\therefore$ $a = \frac{d^2S}{dt^2} = 6kt$ i.e $a \propto t$

89. Displacement of body in 4 sec along OE

$s_x = v_x t = 3 \times 4 = 12\ m$



Force along OF (perpendicular to OE)=4 N

$\therefore$ $a_y = \frac{F}{m} = \frac{4}{2} = 2\ m/s^2$

Displacement of body in 4 sec along OF

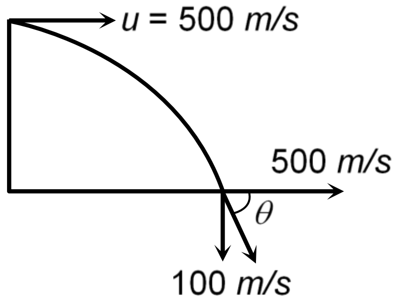
$\Rightarrow s_y = u_y t + \frac{1}{2} a_y t^2 = \frac{1}{2} \times 2 \times (4)^2 = 16\ m$

[As $u_y = 0$]

$\therefore$ Net displacement

$s = \sqrt{s_x^2 + s_y^2} = \sqrt{(12)^2 + (16)^2} = 20\ m$

90. Horizontal component of velocity v_x= 500 m/s



and vertical components of velocity while striking the ground.

$v_y = 0 + 10 \times 10 = 100\ m/s$

$\therefore$ Angle with which it strikes the ground.

$\theta = \tan^{-1}\left(\frac{v_y}{v_x}\right) = \tan^{-1}\left(\frac{100}{500}\right) = \tan^{-1}\left(\frac{1}{5}\right)$

91. According to Newton's second law of motion $a = \frac{F}{m}$ i.e. magnitude of the acceleration produced by a given force is inversely proportional to the mass of the body. Higher is the mass of the body, lesser will be the acceleration produced i.e. mass of the body is a measure of the opposition offered by the body to change a state, when the force is applied i.e. mass of a body is the measure of its inertia.

92. Impulse = Change in momentum = m(v_2 – v_1) …(i)

Again impulse = Area between the graph and time axis

$= \frac{1}{2} \times 2 \times 4 + 2 \times 4 + \frac{1}{2}(4 + 2.5) \times 0.5 + 2 \times 2.5$

$= 4 + 8 + 1.625 + 5$ ...(ii)

From (i) and (ii), $m(v_2 - v_1) = 18.625$

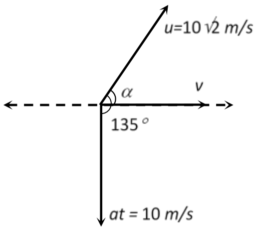
$\Rightarrow v_2 = \frac{18.625}{m} + v_1 = \frac{18.625}{2} + 5 = 14.25 \ m/s$

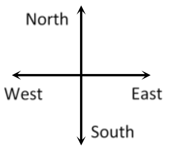
93. $F = m\left(\frac{dv}{dt}\right) = \frac{100 \times 5}{0.1} = 5000N$

94. $\vec{v} = \vec{u} + \vec{a}t \therefore v = \sqrt{u^2 + a^2t^2 + 2u\,at\cos\theta}$

$v = \sqrt{200 + 100 + 2 \times 10\sqrt{2} \times 10 \times \cos 135}$

$= 10\,m/s$





$\tan\alpha = \frac{at\sin\theta}{u + at\cos\theta}\frac{10\sin 135}{10\sqrt{2} + 10\cos 135} = 1 \therefore$

$\alpha = 45°$

i.e. resultant velocity is 10 m/s towards East.

$\vec{v} = \vec{u} + \vec{a}t$

$\therefore \ v = \sqrt{u^2 + a^2t^2 + 2uat\cos\theta}$

$v = \sqrt{200 + 100 + 2 \times 10\sqrt{2} \times 10 \times \cos 135}$
$= 10\,m/s$

95. Standard equation of projectile motion

$y = x\tan\theta - \frac{gx^2}{2u^2\cos^2\theta}$

Comparing with given equation

$A = \tan\theta$ and

$B = \frac{g}{2u^2\cos^2\theta}$

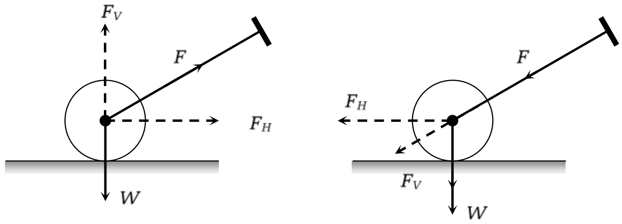
So $\frac{A}{B} = \frac{\tan\theta \times 2u^2\cos^2\theta}{g} = 40$

(As $\theta = 45°, u = 20\,m/s, g = 10\,m/s^2$)

96. Suppose the roller is pushed as in figure (2). The force F is resolved into two components, horizontal component F_H which helps the roller to move forward, and the vertical component acting downwards adds to the weight. Thus weight is increased. But in the case of pull [fig (1)] the vertical

component is opposite to its weight. Thus weight is reduced. So pulling is easier than pushing the

lawn roller.



(a) (b)

97. $x = 36t \therefore v_x = \frac{dx}{dt} = 36 m/s$

$y = 48t - 4.9t^2 \therefore v_y = 48 - 9.8t$

at $t = 0$ $v_x = 36$ and $v_y = 48 m/s$

So, angle of projection

$\theta = \tan^{-1}\left(\frac{v_y}{v_x}\right) = \tan^{-1}\left(\frac{4}{3}\right)$

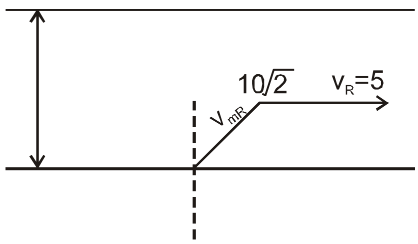
Or $\theta = \sin^{-1}(4/5)$

$x = 36t \therefore v_x = \frac{dx}{dt} = 36 m/s$

$y = 48t - 4.9t^2 \therefore v_y = 48 - 9.8t$

98. $S = \frac{u^2}{2\mu g} = \frac{m^2u^2}{2\mu g m^2} = \frac{P^2}{2\mu m^2 g}$

99.



(A) $t = \frac{100}{10\sqrt{2}\sin 45°}$

(B) Drift = $(v_r + v_{mr}\cos 45°)t$

$$= \left(5 + \frac{10\sqrt{2}}{\sqrt{2}}\right) \times 10 = 150$$

(C) $v_m = \sqrt{5^2 + 200 + 100\sqrt{2}\cos 45^\circ}$

$= 5\sqrt{13}$

(D) $\tan\theta = \dfrac{10\sqrt{2}\sin 45^\circ}{5 + 10\sqrt{2}\cos 45^\circ} = 2/3$

100. $a = \dfrac{m_2}{m_1 + m_2} g = \dfrac{3}{7+3} 10 = 3\, m/s^2$

---- TEXT SOLUTIONS (TS) END ----

Resonance®
Educating for better tomorrow

भारत का विश्वास
रेजोनेंस के साथ

TOTAL ENROLLED STUDENTS
(April 2001 to March 2022)

9,42,310

Classroom: 5,44,210
ResoBASE: 70,844
DLP+eLP: 3,27,256

Note: The figures shown in the map are student count from respective State & Union Territory. The Map is only indicative and not to scale

Resonance : The Legacy of 21 Years (2001-2022) of Academic Excellence

JEE (Adv.) / IIT-JEE ▸ **50 हजार⁺** SELECTIONS SINCE 2002
229 AIRs in TOP-100 (Classroom + DLP)

JEE (Main) / AIEEE ▸ **2.40 लाख⁺** SELECTIONS SINCE 2009
136 AIRs in TOP-100 (Classroom + DLP)

NEET (UG) / AIPMT ▸ **19 हजार⁺** SELECTIONS SINCE 2012
19 AIRs in TOP-100 (Classroom + DLP)

NTSE SINCE 2006 ▸ **2440** Scholars

KVPY SINCE 2006 ▸ **2859** Fellowship Winners

OLYMPIADS SINCE 2006 ▸ **52** Medalists (Gold/Silver/ Bronze) in International Olympiads

CA & CS SINCE 2013 ▸ **4179** Selections — 5 Times AIR-1 in CA & CS Exams

CLAT, SET & GPTU SINCE 2014 ▸ **77** Selections — AIR-1 in GPTU