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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	XII & XIII	COURSE NAME	SAMBHAV, SANKALP PLUS, SAMPOORN	COURSE CODE	MF, MPS, MD
PHASE CODE(S)	MF, MPS, 01MD, 02MD,03MD,04MD	TOTAL PAGES	1	BATCH CODE(S)	MF, MPS, 01MD, 02MD,03MD,04MD

Target Examination & Year:

NEET 2025

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

DATE & DAY:
20TH 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) ✓

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Kota Study Centre & Registered Corporate Office:
CG Tower, A-46 & 52, IPIA, Near City Mall, Jhalawar Road, Kota (Raj.) - 324005
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APPLY ONLINE

ANSWER KEY (AK)

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

STUDENT'S SPACE

TEXT SOLUTIONS (TS)

PAPER

PART-A: CHEMISTRY

1. $P_1 V_1 = P_2 V_2 \Rightarrow 750 \times 120 = P_2 \times 180$
$\therefore P_2 = 500$ mm Ans.

2. Refer to answer key

3. Refer to answer key

4. $\frac{r_{O_2}}{r_{CH_4}} = \frac{n_{O_2}}{n_{CH_4}}\sqrt{\frac{M_{CH_4}}{M_{O_2}}}$

$\frac{r_{O_2}}{r_{CH_4}} = \frac{3\times16}{32\times2}\times\sqrt{\frac{16}{32}} = \frac{3}{4\sqrt{2}}$

5. $Z = \frac{PV_m}{RT} > 1$

$\frac{PV_m}{RT} = \frac{1\times22.4}{R\times T}$

At same pressure = 1 atm.

$\frac{1\times V_m}{RT} > \frac{1\times22.4}{R\times T}$

$\Rightarrow$ $V_m > 22.4$ L at STP for real gas.

For, $V_m = 22.4$ L of real gas, we have to increase the pressure.

6. Refer to answer key

7. Order of Vander waals constant
$CO_2 > CH_4 > N_2 > H_2$
ease of liquefication $CO_2 > CH_4 > N_2 > H_2$

8. Refer to answer key

9. $V_{rms,SO_2} = V_{rms,O_2}$ (Given)

$\frac{V_{rms,SO_2}}{V_{O_2}} = \sqrt{\frac{T_{SO_2}}{T_{O_2}}\times\frac{M_{O_2}}{M_{SO_2}}}$

$1 = \sqrt{\frac{T_{SO_2}}{303}\times\frac{32}{64}}$

$T_{SO_2} = 606$ K.

10. Critical temperature is a temperature above which it is not possible to liquefy a gas with the application of pressure.

11. Intermolecular force like attraction force 'a' for which gas behave like a real gas but not idealy.

12. Average KE $= \frac{3}{2}\times\frac{8.314\times300}{6.023\times10^{23}}$
$= 6.21 \times 10^{-21}$ J/molecule.

13. Initially, partial pressures were equal. As $r \propto \sqrt{1/d}$ or $\sqrt{1/M}$, therefore amounts diffused out in the same time will be $H_2 > CH_4 > SO_2$. Amounts left will be $H_2 < CH_4 < SO_4$ or $SO_2 > CH_4 > H_2$. Hence $p_{SO_2} > p_{CH_4} > p_{CH_4} > p_{H_2}$.

14. Refer to answer key

15. Refer to answer key

16. New gas may have pressure equal to sum of both reacting gases or less or more depending on the reacting gases and product formed.

17. $\frac{n_1T_1}{P_1} = \frac{n_2T_2}{P_2}$

$\therefore$ $\frac{1\times300}{2.46} = \frac{n_2\times400}{1}$

$\therefore$ $n_2 = 0.3$

$\therefore$ Mass of oxygen left $= 0.3 \times 32$
$= 9.6$ g

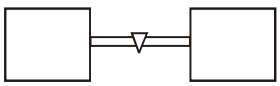
$\therefore$ Mass of oxygen escaped
$= 1 \times 32 - 9.6 = 22.4$ g.

18. Using equation of state $\frac{P_1V_1}{T_1} = \frac{P_2V_2}{T_2}$. So,

$\frac{1\times2.5}{300} = \frac{1.5\times2.0}{T}$ T = 360 K or 87ºC

19. $\frac{n_1T_1}{P_1} = \frac{n_2T_2}{P_2} \Rightarrow \frac{3\times300}{3} = \frac{5\times400}{P_2}$

$P_2 = \frac{20}{3}$ atm

20. 

using conservation of moles $\frac{1\times3}{400} + \frac{3\times2}{600}$

$= \frac{P\times5}{500} \Rightarrow P = \frac{20}{3}$ atm

21. Refer to answer key

22. As per the definition.

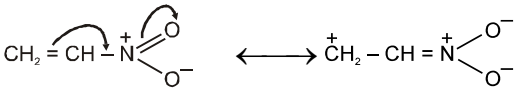
23. Refer to answer key

24. Refer to answer key

25. Refer to answer key

26. Due to presence of conjugated system.

27. Refer to answer key

28. 

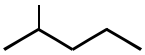
29. If the no. of C-atoms in the ring and in the side chain are the same, then the name of ring appears in word root and side chain appears as secondary prefix.

30. Lone pair present on nitrogen repel the negative charge.

31. Refer to answer key

32. Refer to answer key

33. $-NO_2 > -CN > -CHO > -COOH.$

34. 

It has only six carbon atoms.

35. Refer to answer key

36. $16r_1 = \frac{r \times n^2}{z}$ (here z = 1)

therefore n = 4

$E_4 = -13.6\ \frac{z^2}{n^2}\ eV = -\frac{13.6}{16} = -0.853\ eV$

37. Z = 2

$n_1 = 1$

$n_2 = \infty$

$\bar{\nu} = R(2)^2 \left(\frac{1}{1^2} - \frac{1}{\infty^2}\right) = 4R$

38. (a) $6 \to 3$ $\quad \Delta n = 3$

$\therefore$ no. of lines = $\frac{3(3+1)}{2} = 6$

All lines are in infrared region

(b) $7 \to 3$ $\quad \Delta n = 4$

$\therefore$ no. of lines = $\frac{4(4+1)}{2} = 10$

All lines are in infrared region

(c) $5 \to 2$ $\quad \Delta n = 3$

All lines are in visible region

(d) $6 \to 2$ $\quad \Delta n = 4$

All lines are in visible region

39. Refer to answer key

40. Refer to answer key

41. d_{z^2} has shape like baby soother.

42. Cu^{2+} : [Ar]$3d^9$ (One unpaired e)

Cr^{3+} : [Ar]$3d^3$ (Three unpaired e)

spin only magnetic moment = $\sqrt{3(3+2)}$

= $\sqrt{15}$

Ti^{4+} : [Ar] $3d^\circ\ 4s^\circ$ (0 unpaired e)

spin only magnetic moment = $\sqrt{0(0+2)}$

= 0

Ag^+ : [Kr] $3d^{10}$ (0 unpaired e)

43. ℓ should be $\geq$ 2 (as m = 2)

For p orbital ℓ = 1.

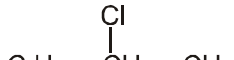
44. Element $1s^2\ 2s^2\ 2p^6\ 3p^6\ 4s^2\ 3d^{10}\ 4p^6\ 5s^2\ 4d^x$ For 3d, 4p, 5p ; $n + \ell = 5$.

Cation (2+) $1s^2\ 2s^2\ 2p^6\ 3p^6\ 4s^2\ 3d^{10}\ 4p^6\ 5s^0\ 4d^x$

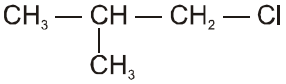
45. Refer to answer key

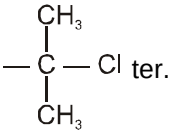
46. Different C skeleton across the ester functional group.

47. Refer to answer key

48. (1)  sec. alkylhalide.

(2)  sec. alkylhalide.

(3)  primary alkylhalide.

(4)  ter. alkyl halide

49. Refer to answer key

50. Refer to answer key

PART-B: PHYSICS

51. $u = 100\ m/s, v = 0, s = 0.06\ m$

Retardation $= a = \frac{u^2}{2s} = \frac{(100)^2}{2 \times 0.06} = \frac{1 \times 10^6}{12}$

$\therefore$ Force

$= ma = \frac{5 \times 10^{-3} \times 1 \times 10^6}{12} = \frac{5000}{12} = 417\ N$

52. $\vec{F} = m\vec{a}$

53. Acceleration $a = \frac{F}{m} = \frac{100}{5} = 20\ cm/s^2$

Now $v = at = 20 \times 10 = 200\, cm/s$

54. Refer to answer key

55. $F = u\left(\frac{dm}{dt}\right) = 400 \times 0.05 = 20\ N$

56. Refer to answer key

57. Refer to answer key

58. Up thrust on the body $= v\sigma\, g$. For freely falling body effective g becomes zero. So up thrust becomes zero

59. Refer to answer key

60. Total weight in right hand = 10 + 1 = 1 *kg*

61. Refer to answer key

62. Refer to answer key

63. In the given condition the required centripetal force is provided by frictional force between the road and tyre.

$\frac{mv^2}{R} = \mu mg \ \therefore v = \sqrt{\mu\, Rg}$

64. Retarding force

$F = ma = \mu R = \mu\, mg \ \therefore a = \mu g$

Now from equation of motion

$v^2 = u^2 - 2as$

$\Rightarrow 0 = u^2 - 2as \Rightarrow s = \frac{u^2}{2a} = \frac{u^2}{2\mu\, g} \ \therefore = \frac{v_0^2}{2\mu\, g}$

65. Net force = Applied force – Friction force

$ma = 24 - \mu\, mg = 24 - 0.4 \times 5 \times 9.8$

$= 24 - 19.6$

$\Rightarrow a = \frac{4.4}{5} = 0.88\ m/s^2$

66. Retardation in upward motion

$= g(\sin\theta + \mu\cos\theta)$

$\therefore$ Force required just to move up $F_{up} = mg(\sin\theta + \mu\cos\theta)$

Similarly for down ward motion $a = g(\sin\theta - \mu\cos\theta)$

$\therefore$ Force required just to prevent the body sliding down

$F_{dn} = mg(\sin\theta - \mu\cos\theta)$

According to problem $F_{up} = 2F_{dn}$

$\Rightarrow mg(\sin\theta + \mu\cos\theta) = 2mg(\sin\theta - \mu\cos\theta)$

$\Rightarrow \sin\theta + \mu\cos\theta = 2\sin\theta - 2\mu\cos\theta$

$\Rightarrow 3\mu\cos\theta = \sin\theta \Rightarrow \tan\theta = 3\mu$

$\Rightarrow \theta = \tan^{-1}(3\mu) = \tan^{-1}(3 \times 0.25) = \tan^{-1}(0.75)$

$= 36.8°$

67. $\mu = \tan\theta\left(1 - \frac{1}{n^2}\right)$

$\theta = 45°$ and $n = 2$ (Given)

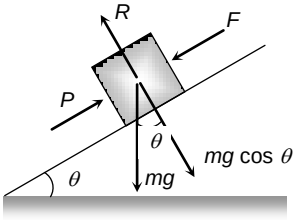
$\therefore\ \mu = \tan 45°\left(1 - \frac{1}{2^2}\right) = 1 - \frac{1}{4} = \frac{3}{4} = 0.75$

68. $a = g(\sin\theta - \mu\cos\theta) = 9.8(\sin 45^o - 0.5\cos 45^o)$

$= \frac{4.9}{\sqrt{2}}\ m/\sec^2$

69. Because if the angle of inclination is equal to or more than angle of repose then box will automatically slides down the plane.

70.



Net force along the plane

$= P - mg\sin\theta = 750 - 500 = 250\ N$

Limiting friction = $F_l = \mu_s R = \mu_s mg\cos\theta$

= 0.4 × 102 × 9.8 × cos 30 = 346 *N*

As net external force is less than limiting friction therefore friction on the body will be 250 *N*.

71. $a = g(\sin\theta - \mu\cos\theta)$

$= 10(\sin 60° - 0.25\cos 60°)$

$a = 7.4\ m/s^2$

72. Work done by centripetal force is always zero, because force and instantaneous displacement are always perpendicular.

$W = \vec{F}.\vec{s} = Fs\cos\theta = Fs\cos(90°) = 0$

73. Work = Force × Displacement (length)

If unit of force and length be increased by four times then the unit of energy will increase by 16 times.

74. No displacement is there.

75. Stopping distance $S \propto u^2$. If the speed is doubled then the stopping distance will be four times.

76. $W = Fs\cos\theta \Rightarrow \cos\theta = \frac{W}{Fs} = \frac{25}{50} = \frac{1}{2} \Rightarrow \theta = 60°$

77. Work done = Force × displacement

= Weight of the book × Height of the book shelf

78. Work done does not depend on time.

79. $W = \vec{F}.\vec{s} = (5\hat{i} + 3\hat{j}).(2\hat{i} - \hat{j})$ = 10 – 3 = 7 *J*

80. $v = \frac{dx}{dt} = 3 - 8t + 3t^2$

$\therefore v_0 = 3\,m/s$ and $v_4 = 19\,m/s$

$W = \frac{1}{2}m(v_4^2 - v_0^2)$ (According to work energy theorem)

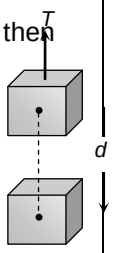
$= \frac{1}{2} \times 0.03 \times (19^2 - 3^2) = 5.28\,J$

81. As the body moves in the direction of force therefore work done by gravitational force will be positive.

$W = Fs = mgh = 10 \times 9.8 \times 10 = 980\,J$

82. $W \int_0^{x_1} F.dx = \int_0^{x_1} Cx\,dx = C\left[\frac{x^2}{2}\right]_0^{x_1} = \frac{1}{2}Cx_1^2$

83. When the block moves vertically downward with acceleration $\frac{g}{4}$ then tension in the cord



$T = M\left(g - \frac{g}{4}\right) = \frac{3}{4}Mg$

Work done by the cord = $\vec{F}.\vec{s} = Fs\cos\theta$

$= Td\cos(180°) = -\left(\frac{3Mg}{4}\right) \times d = -3Mg\frac{d}{4}$

84. $W = \frac{F^2}{2k}$

If both springs are stretched by same force then $W \propto \frac{1}{k}$

As $k_1 > k_2$ therefore $W_1 < W_2$

*i.e.*more work is done in case of second spring.

85. $\Delta\text{P.E.} = \frac{1}{2}k(x_2^2 - x_1^2) = \frac{1}{2} \times 10[(0.25)^2 - (0.20)^2]$

$= 5 \times 0.45 \times 0.05 = 0.1\,J$

86. $\frac{1}{2}kS^2 = 10\,J$ (given in the problem)

$\frac{1}{2}k\left[(2S)^2 - (S)^2\right] = 3 \times \frac{1}{2}kS^2 = 3 \times 10 = 30\,J$

87. $U = \frac{F^2}{2k} \Rightarrow \frac{U_1}{U_2} = \frac{k_2}{k_1}$ (if force are same)

$\therefore \frac{U_1}{U_2} = \frac{3000}{1500} = \frac{2}{1}$

88. Here $k = \frac{F}{x} = \frac{10}{1 \times 10^{-3}} = 10^4\,N/m$

$W = \frac{1}{2}kx^2 = \frac{1}{2} \times 10^4 \times (40 \times 10^{-3})^2 = 8\,J$

89. $W = \int_0^5 F dx = \int_0^5 (7 - 2x + 3x^2)\,dx$ =

$[7x - x^2 + x^3]_0^5$

= 35 – 25 + 125 = 135 *J*

90. $S = \frac{t^3}{3} \therefore dS = t^2 dt$

$a = \frac{d^2S}{dt^2} = \frac{d^2}{dt^2}\left[\frac{t^3}{3}\right] = 2t\,m/s^2$

Now work done by the force $W = \int_0^2 F.dS = \int_0^2 ma.dS$

$\int_0^2 3 \times 2t \times t^2 dt = \int_0^2 6t^3 dt = \frac{3}{2}\left[t^4\right]_0^2$ = 24 *J*

91. $W = \frac{1}{2}kx^2$

If both wires are stretched through same distance then $W \propto k$. As $k_2 = 2k_1$ so $W_2 = 2W_1$

92. $P = \sqrt{2mE} \therefore P \propto \sqrt{m}$ (if $E = \text{const.}$) $\therefore$ $\frac{P_1}{P_2} = \sqrt{\frac{m_1}{m_2}}$

93. Work in raising a box

= (weight of the box) × (height by which it is raised)

94. $E = \frac{P^2}{2m}$ if *P* = constant then $E \propto \frac{1}{m}$

95. Body at rest may possess potential energy.

96. Due to theory of relativity.

97. $E = \frac{P^2}{2m} \therefore E \propto P^2$

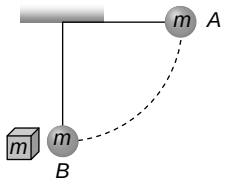
*i.e.*if *P* is increased *n* times then *E* will increase n^2 times.

98.

99. P.E. of bob at point *A* = *mgl*

This amount of energy will be converted into kinetic energy

$\therefore$ K.E. of bob at point *B* = *mgl*



and as the collision between bob and block (of same mass) is elastic so after collision bob will come to rest and total Kinetic energy will be transferred to block. So kinetic energy of block = *mgl*

100. According to conservation of momentum

Momentum of tank = Momentum of shell

125000 × v_{tank} = 25 × 1000 $\Rightarrow v_{tank}$ = 0.2 *ft/sec.*

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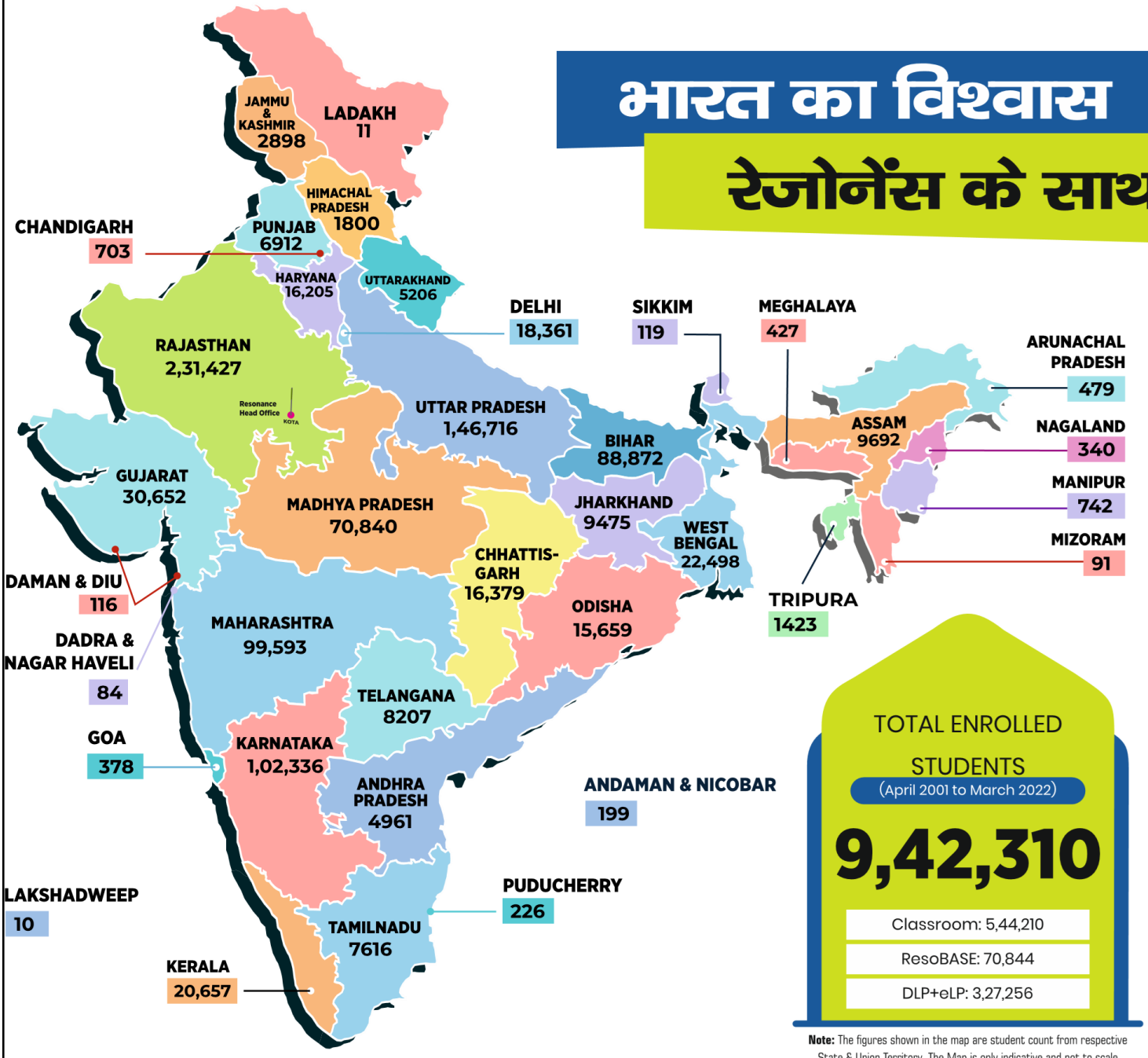
भारत का विश्वास
रेजोनेंस के साथ



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)

NTSE SINCE 2006 ▸ **2440** Scholars

KVPY SINCE 2006 ▸ **2859** Fellowship Winners

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

CA & CS ▸ **4170** 5 Times AIR-1 in