

Strategy to Crack GATE Exam

Special class

+ MY COURSES



AKASH TYAGI SIR

EXPERT IN ESE/GATE

**GATE TOPPER
IES OFFICER (UPSC)
ISRO, AFCAT TOPPER**

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**IISc Bangalore
Mechanical Engg.**

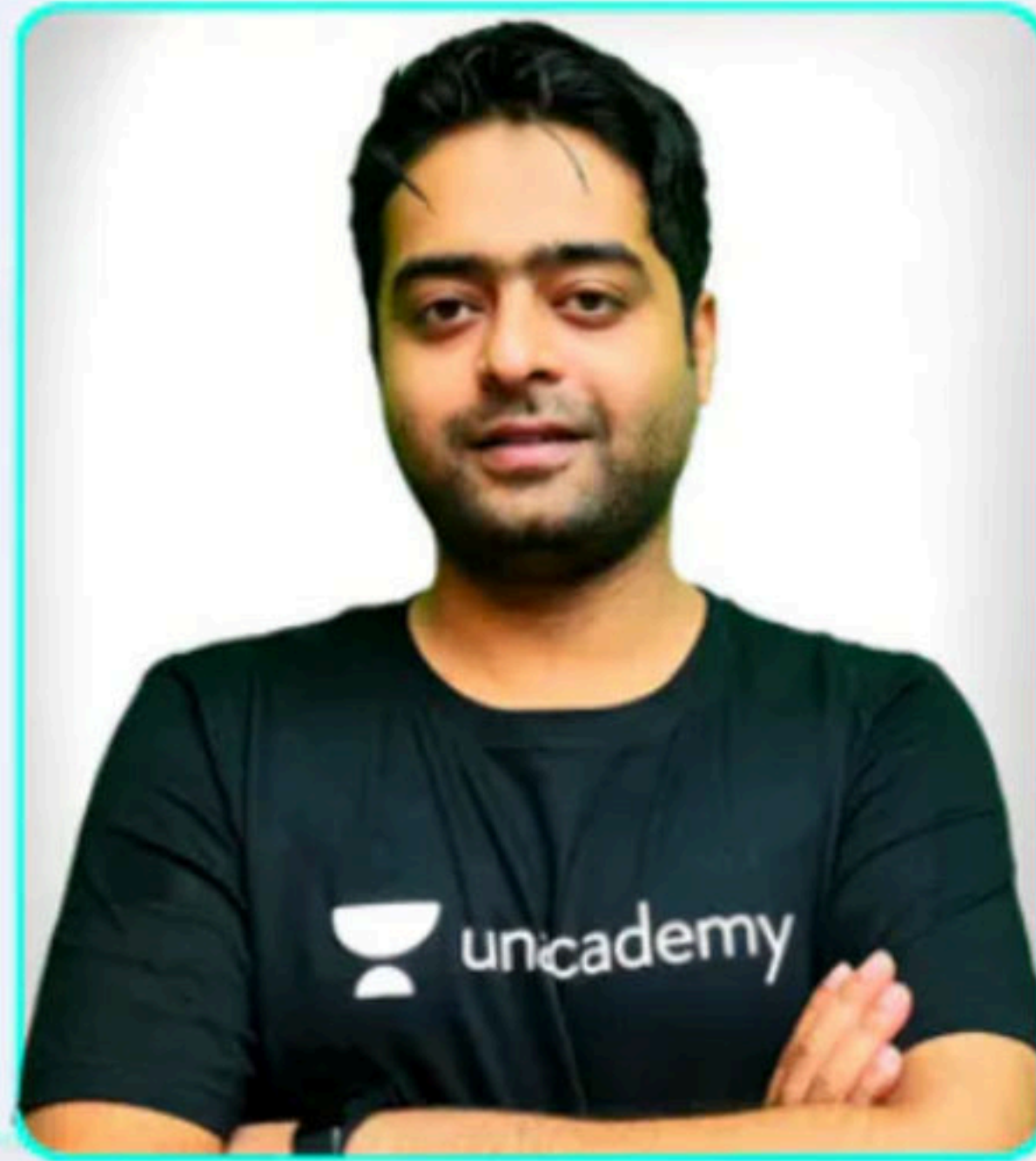



**7+ years of Teaching
Experience**



Heat & Mass Transfer, IC Engine, Thermodynamics, RAC , Fluid Machines,	Power Plant, Engg. Mechanics, Strength of Materials, Renewable Sources of Energy, Vibrations
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Reference books

Name of the Book	Author
1) Engineering Mechanics	Rk Rajput / RAMAMURTHAM
Engineering Mathematics	UC Jindal
Mechanics of Materials	Beer & Johnson
Mechanics of Materials	BC Punima + RAMAMURTHAM
Mechanical of Vibrations	GC Grover
Theory of Mechanisms and Machines	A Ghosh and AK Malik
A Text-Book of Fluid Mechanics	RK Bansal
Design of machine Elements	<u>VB Bhandari</u>

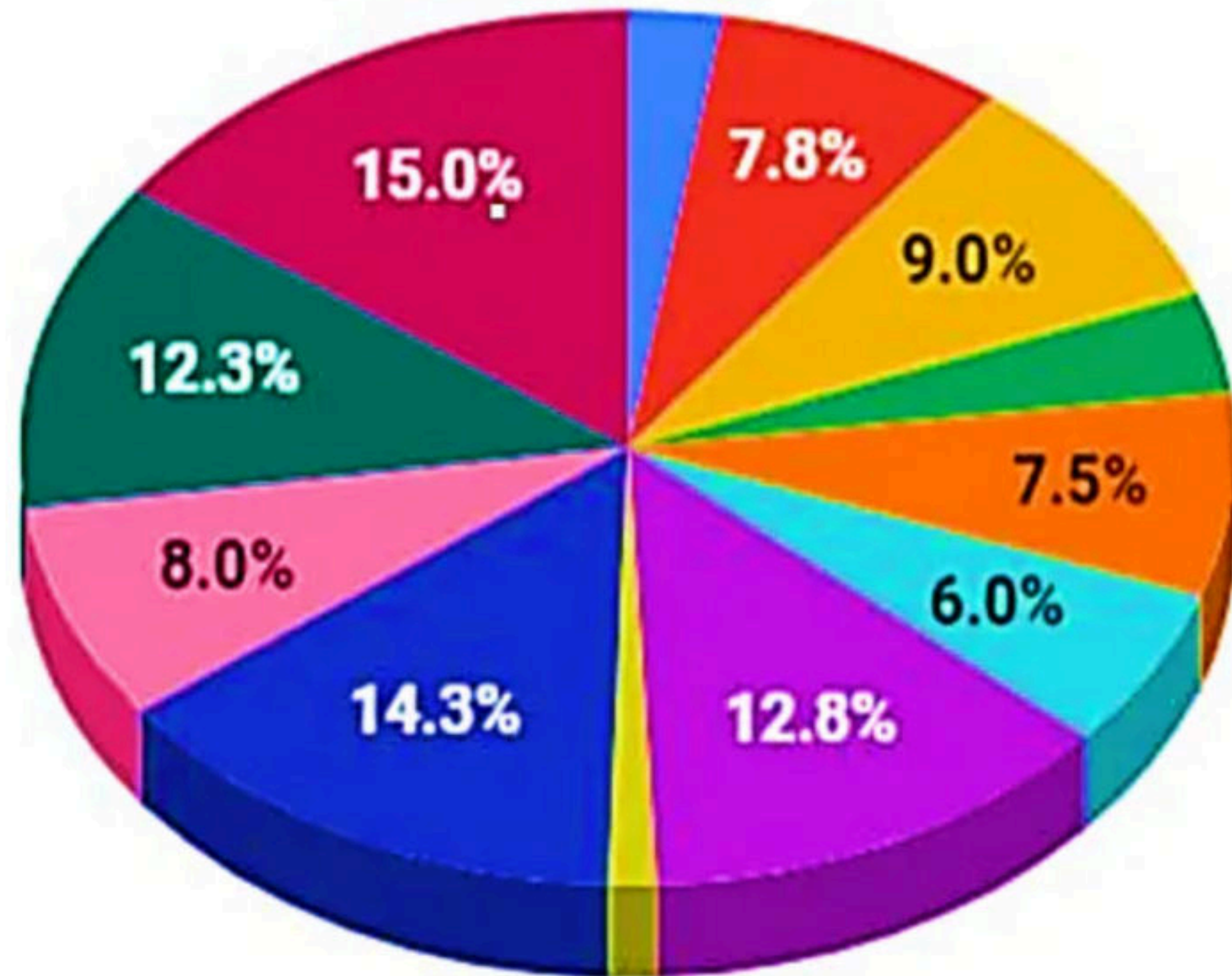


Reference books

Name of the Book	Author
Fluid Mechanics - Fundamentals and Applications	<u>Cengel and Cimbala</u>
Heat Transfer (Revised Edition)	<u>JP Holman</u>
Power Plant Engineering	PK Nag
Internal Combustion Engines	V Ganesan X
Refrigeration and Air Conditioning	CP Arora ✓
Manufacturing Engineering and Technology	Kalpakjian ESE
Operation Research	Kanti Swarup

Topics Vs Weightage in Marks

- Engineering Mechanics
- Strength of materials
- Theory of Mechanics
- Machine Design
- Fluid Mechanics
- Heat Transfer
- Thermodynamics
- Refrigeration & Air Conditio...
- Manufacturing Engineering
- Industrial Engineering
- Engineering Maths
- General Aptitude



Gate Mechanical Engineering (Marks wise Weightage)

Topic	Weightage in Marks
Engineering Mechanics	2.5 [2-6 MARKS]
Strength of materials	7.75 [8M]
Theory of Mechanics	9 [8-9M]
Machine Design	3.75 (3-4)
Fluid Mechanics	7.5 [6-8M]
Heat Transfer	6 [COMPLETE]
Thermodynamics	12.75 } 14M-16M
Refrigeration & Air Conditioning	1.25 } [12-14M]
Manufacturing Engineering	14.25
Industrial Engineering	8
Engineering Maths	12.25 [12-13M]
General Aptitude	15

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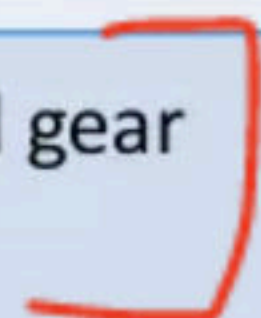
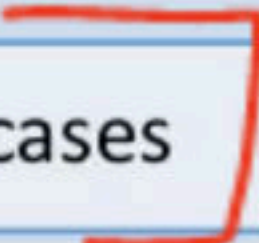
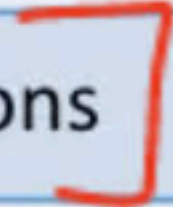
Important Topics for GATE:
(Mechanical Engineering)

Sr No	Subject	Main Topics
1	Manufacturing Engineering	Casting : Gating ratio in casting, Solidification time, Pouring time calculation , Casting methods , Sprue design
		Welding : V-I characteristics , Resistance welding calculations, Melting efficiency, Special Welding theory
		Limit, tolerance, fits
		Metal Cutting : Theory of metal cutting , Merchant Circle Diagram, Taylor's Tool life equation
		Rolling calculations
		Wire drawing and extrusion calculations
		Sheet metal operations - clearance, force, power, shear calculations
		Machining : Lathe, drilling , milling , shaping cutting time calculations
		Grinding and finishing

Sr No	Subject	Main Topics
1	Manufacturing Engineering	Non traditional machining : ECM- MRR and feed calculations ,EDM theory , comparison of all NTMM
		NC-CNC machines BLU calculations, M&G codes
		Transformations – rotation, translation
		3-2-1 principle

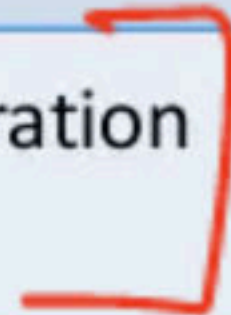
Sr No	Subject	Main Topics
<p>2</p> 	<p>Engineering Mathematics</p> <p>[DIPLOMA]</p> <p>+</p> 	<p>Determinants: Eigen value, Eigen vector, System of Linear equations</p> <p>Differential equations</p> <p>Laplace Transforms</p> <p>Probability and statistics</p> <p>Numerical methods: Newton Raphson, Ranga Kutta, Trapezoidal</p> <p>Calculus: gradient, multiple integrals</p> <p>Complex variables</p> <p>Matrix Algebra: Rank calculation, Cayley Hamilton Theorem</p> <p>Partial Derivatives</p> <p>Fourier Series</p>


Sr No	Subject	Main Topics
3	Theory of Machines	Mechanisms: Quick return ratio, DOF calculations, Inversion of mechanism, Grashof's Law
		Velocity & Acc: Coriolis acceleration, Velocity calculation by using I-centres
		Cams - Basic formulae based questions on Cams
		Turning moment of crankshaft
		Gears - Speed and No. of teeth in epicyclic and compounded gear train
		Vibrations- Frequency calculations for different cases
		Simple balancing questions
Gyroscope questions- uniform disk and ship cases		



2-3M

Sr No	Subject	Main Topics
4	Fluid Mechanics and Hydraulics	<p data-bbox="1359 211 2558 277">Fluid Properties: Newton's law of viscosity</p> <p data-bbox="1359 333 2045 399">Pressure measurements</p> <p data-bbox="1359 446 2818 634">Fluid Dynamics: Bernoulli's Equation, Buoyancy and metacentre height</p> <p data-bbox="1359 680 2908 868">Fluid Kinematics: Streamline, velocity and acceleration calculations</p> <p data-bbox="1359 915 2332 981">Flow measurement: Venturimeter</p> <p data-bbox="1359 1037 1809 1103">Boundary Layer</p> <p data-bbox="1359 1149 2845 1337">Flow through pipes: Laminar flow through pipes and between parallel plates</p> <p data-bbox="1359 1384 3058 1450">Centrifugal pump: Mass flow rate calculation, specific speed</p> <p data-bbox="1359 1618 3052 1806">Turbines: unit quantities , specific speed, Pelton and Francis turbine</p>



Sr No	Subject	Main Topics
5	Strength of Material  + <u>RAMAMURTHAM</u>	Thermal stresses
		SFD , BMD for propped beam , simple supported and cantilever beams
		Bending stress equation
		Application of torsion equation
		Mohr Circle – 2D
		Theories of Failure – MDET and MSST
		Hoop stress and max shear stress in thin pressure vessels
		Simple questions on Euler’s formula for different columns cases
		Stiffness and shear stress of springs

Sr No	Subject	Main Topics
6	Heat Transfer	Conduction: Conduction heat transfer, Thermal resistance and temperature profile
		Convection: Different numbers used in free and forced convection, Mean bulk temperature
		Radiation: Radiation heat transfer, Radiation heat transfer between infinitely large plates with or without shield, View factor
		Heat Exchanger: LMTD for counter and parallel flow heat exchangers, LMTD when fluid undergoes phase change, Effectiveness of Heat Exchanger

[AKASH]

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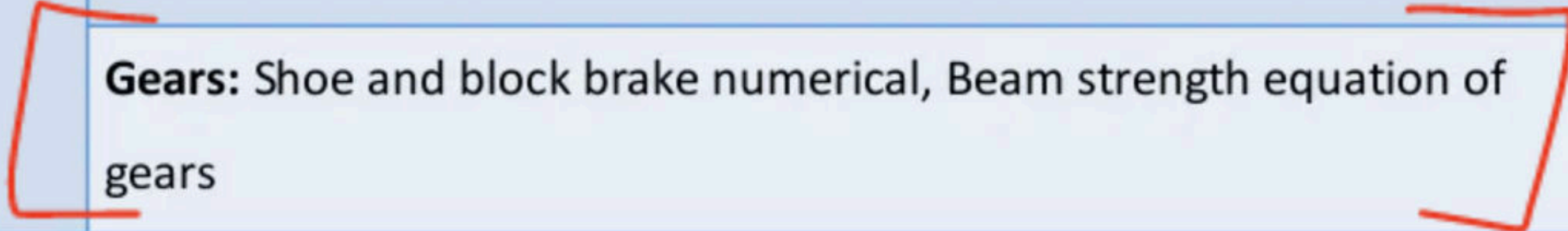
Sr No	Subject	Main Topics
7	Industrial Engineering	Forecasting: Simple and weighted moving average forecasting
		Inventory: EOQ and total inventory cost for different models
		Linear Programming
		PERT: Critical path duration and float
		Queuing Theory: Length and waiting time in queue and system
		Sequencing: Sequencing problems of single machine with multiple jobs
		Assignment problems


Sr No	Subject	Main Topics
8	Thermodynamics	<p>1st and 2nd Law, Heat and Work transfer calculations for different processes</p> <p>Carnot Cycle</p> <p>Entropy calculation</p> <p>Availability calculation</p> <p>Clausius – Clapeyron equation</p> <p>Properties of Pure substances</p>

Sr No	Subject	Main Topics
9	Engineering Mechanics	Plane truss] ★ Lami's theorem] 1/2M Friction especially on inclined planes] [★★ <u>Energy conservation equation</u>

Sr No	Subject	Main Topics
10	Machine Design	Fluctuating Load: Goodman and Soderberg Equation for FOS, S-N curve numerical
		Riveted and Bolted Joints: Max. Stress/ force calculations in riveted and bolted joints
		Bearings: Sommerfeld number, Ball bearing life equivalent load
		Gears: Shoe and block brake numerical, Beam strength equation of gears

SPECIAL



Sr No	Subject	Main Topics
11	Material Science 	Heat treatment
		Crystal structure - APF
		Crystal Defects - Point and line defects
		Fe-C diagram
		TTT diagram
		Lever rule

$$n = 10 +$$

$$\gamma = 1.4$$

$$n = 6$$

$$\gamma = 1$$

$$\eta = 1 - \left(\frac{1}{n} \right)$$

$$\downarrow$$

$$2$$

$$\sim 2.6$$

$$\sqrt{9}$$

$$\downarrow$$

$$3$$

Sr No	Subject	Main Topics
12	✓ RAC 2 (FULL)	VCERS Cop of heat pump and refrigerator Psychrometry- Relative humidity and humidity ratio calculations
13	✓ IC Engines 2 (FULL)	Air standard cycles – efficiency, max temp and pressure, specific fuel consumption /work output Fuel gas analysis
14	✓ Power Plant 2 (FULL)	Rankine and Brayton cycle Degree of reaction
15	Aptitude and English	

PSU & GOVT. JOBS

ONGC, IOCL, NTPC, CIL,
SAIL, BPCL, GAIL, NLC,
HPCL, OIL, PGCIL, HAL,
NMDC, NALCO, MDL,
AAI, NPCIL, DDA,
ELECTRICITY BOARDS
AND MANY MORE....

MANAGEMENT COURSES

PGDIE/PGDM/PGDMM
FROM NITIE

HIGHER STUDIES FOREIGN UNIVERSITIES

NUS(SINGAPORE),
NTU(SINGAPORE),
TUM(SINGAPORE),
RWTH(SINGAPORE)

GATE

GATEWAY FOR ENGINEERS

RESEARCH COURSES

DUAL DEGREE M.TECH+
PH.D COURSES FROM
IISC, IITS, SCIR


HIGHER STUDIES INDIAN UNIVERSITIES

M.TECH/M.S FROM
IISC, IITS, NITS, IITS


RESEARCH ORIENTED JOBS

DRDO, BARC ETC.

Subject wise Weightage Analysis of GATE Syllabus



Subject	Average % (5 years)
Manufacturing Engineering	17.11%
Reasoning, Aptitude & English	15.00%
Engineering Mathematics	12.83%
Strength of Materials	9.00%
Theory of Machines	8.19%
Fluid Mechanics & Fluid Machines	8.12%
Heat Transfer	5.44%
Industrial Engineering	5.16%
Thermodynamics	4.96%
Engineering Mechanics	4.17%
Machine Design	3.53%
Internal Combustion Engines	2.00%
Power Plant Engineering	1.83%
Refrigeration & Air Conditioning	1.63%
Material Science	1.03%
Total	100%



SUBJECTS ON UNACADEMY

- ① I.C. ENGINE
- ② H.M.T.
- ③ VIBRATIONS
- ④ SOM
- ⑤ ENGG. MECH.
- ⑥ POWER PLANT

[R.S.F.]

GATE & ESE

PLUS ICONIC

6
MONTHS

SAVE 25%

₹3,713/mo

Most Popular ✓

12
MONTHS

SAVE 54%

₹2,269/mo

18
MONTH

SAVE 61%

₹1,925/mo

No cost EMI available on 6 months ... >

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₹27,225
for 12 months

Proceed to
payment

GATE & ESE

PLUS ICONIC

12
MONTHS

SAVE 54%

₹2,269/mo

Most Popular ✓

18
MONTHS

SAVE 61%

₹1,925/mo

24
MONTH

SAVE 67%

₹1,650/mo

No cost EMI available on 6 months ... >

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₹34,650
for 18 months

Proceed to
payment

GATE & ESE

PLUS ICONIC

18
MONTHS

SAVE 61%

₹1,925/mo

✓

24
MONTHS

SAVE 67%

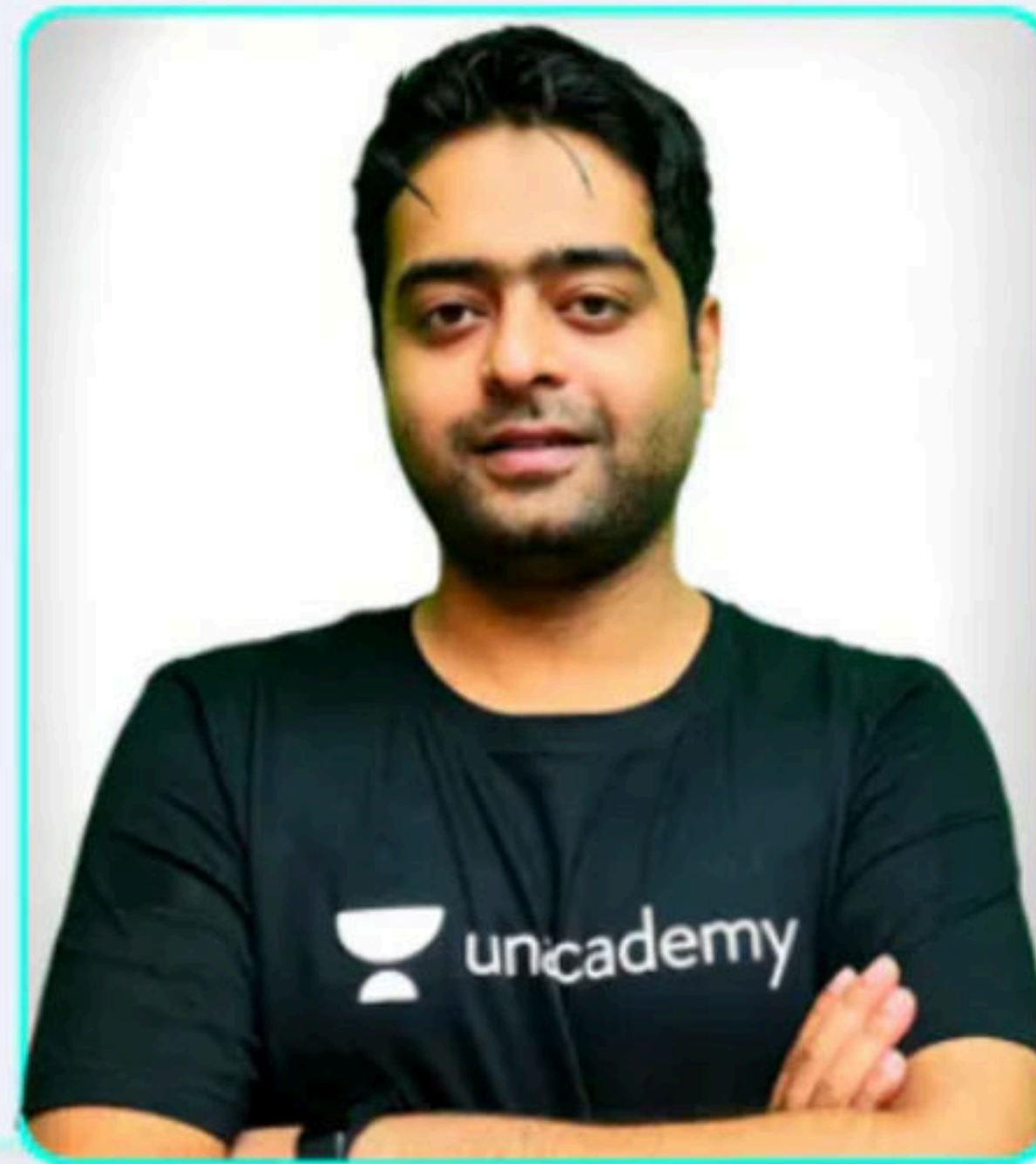
₹1,650/mo

No cost EMI available on 6 months ... >

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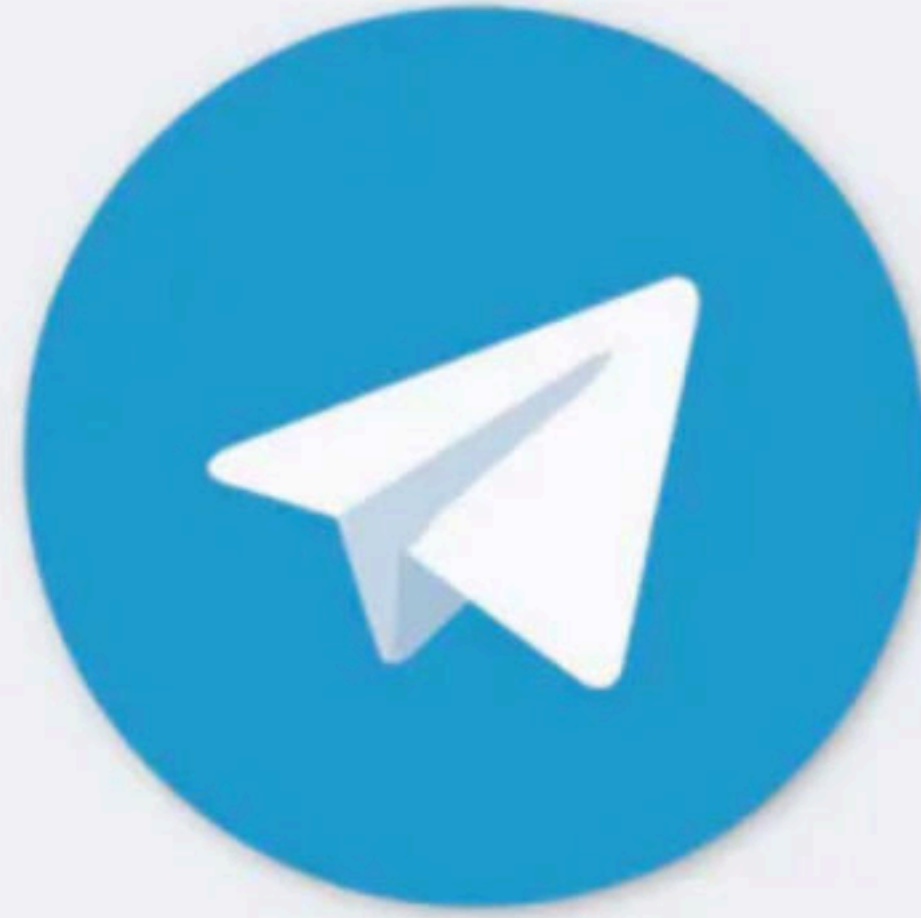
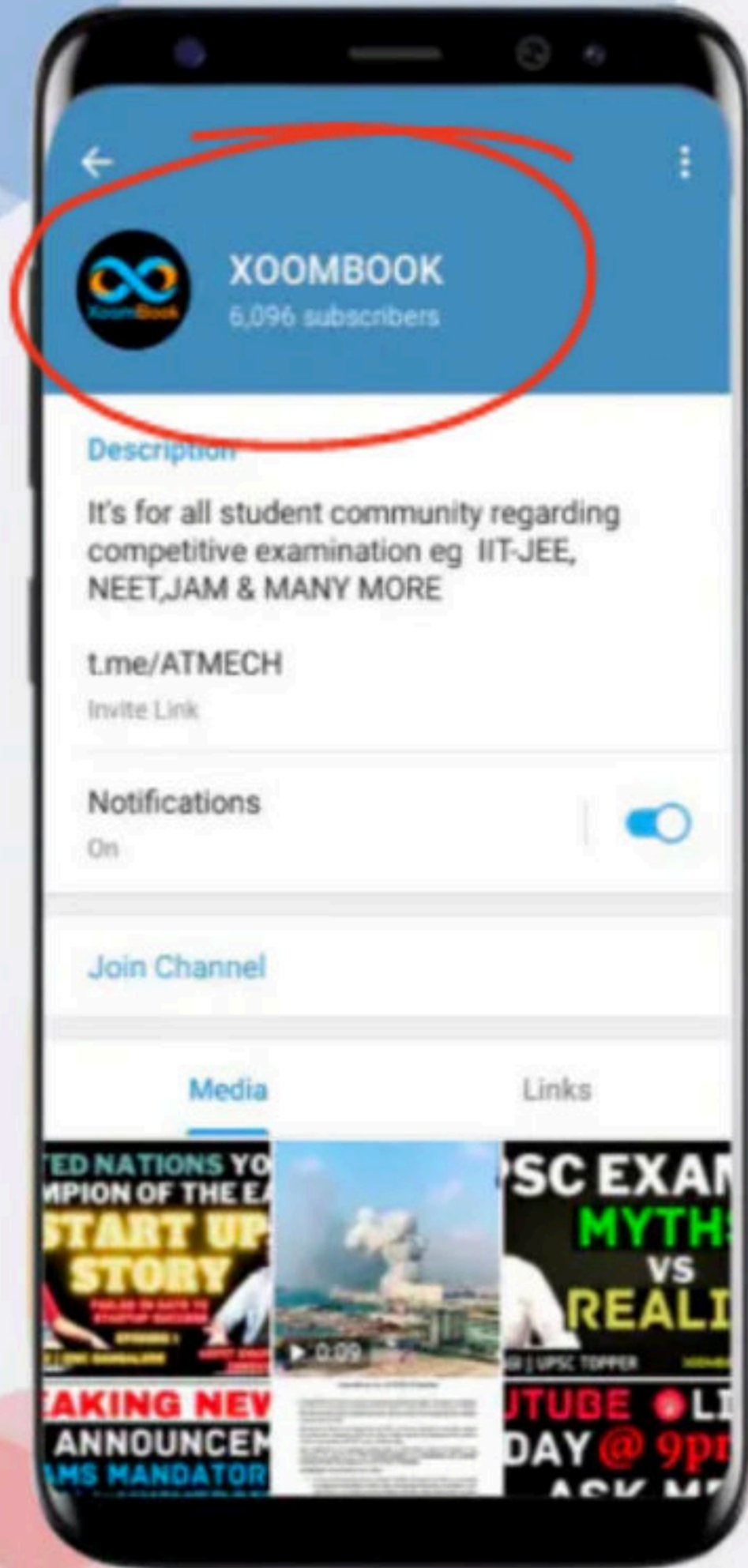
₹39,600
for 24 months

Proceed to
payment



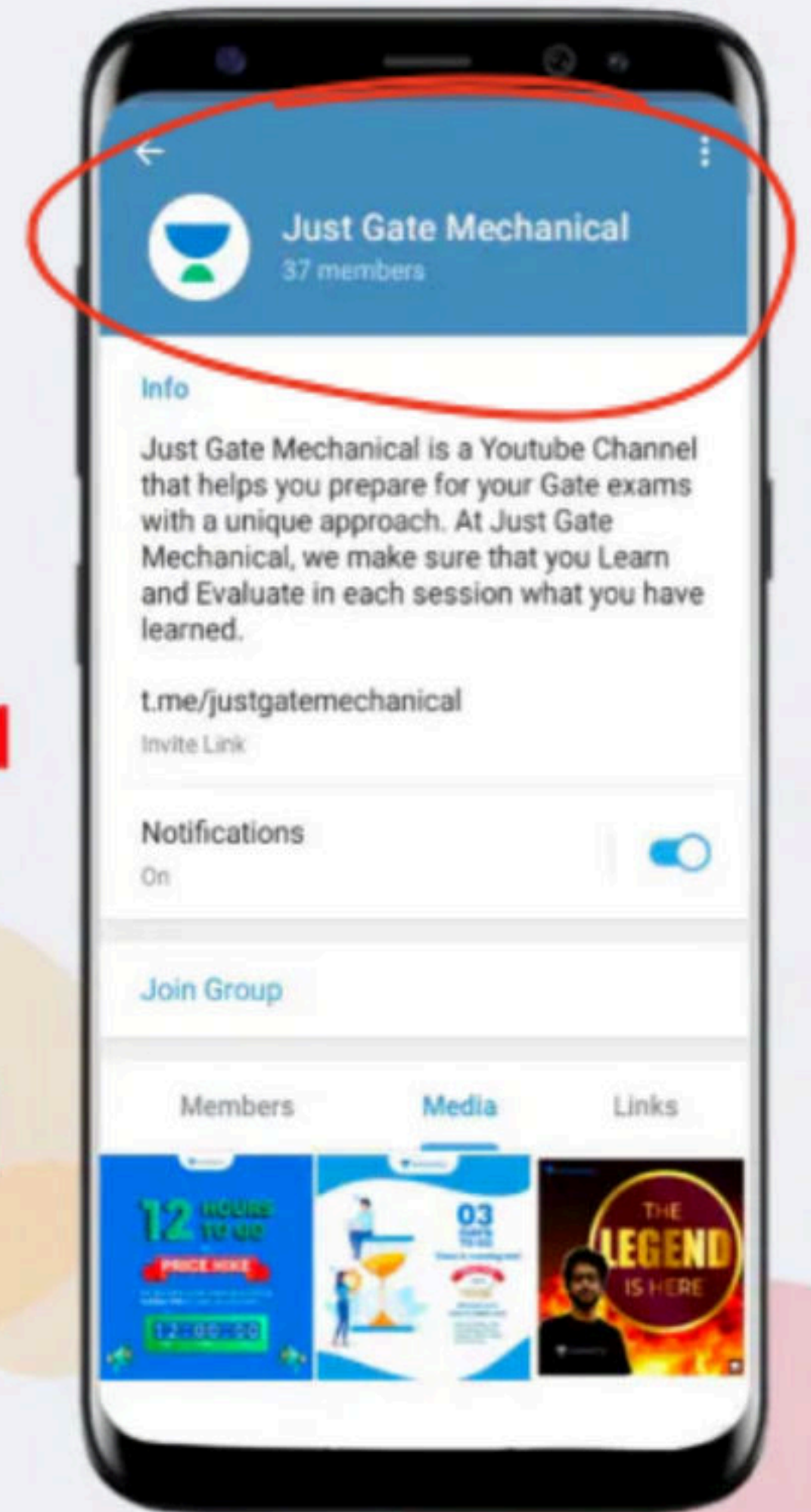
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Thank You

