

GATE 2021

GENERAL APTITUDE

धमाकेदार ट्रिक के साथ 🔥🔥

**TIME & WORK -6,
CONCEPT OF MDH**



AVINASH SIR



AVINASH SINGH SIR

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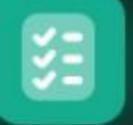
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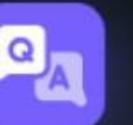
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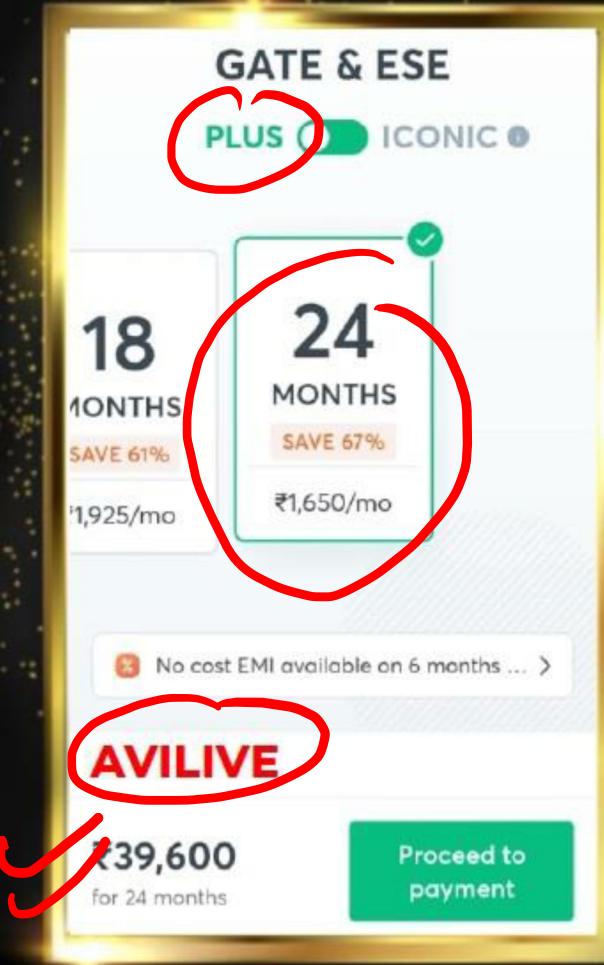
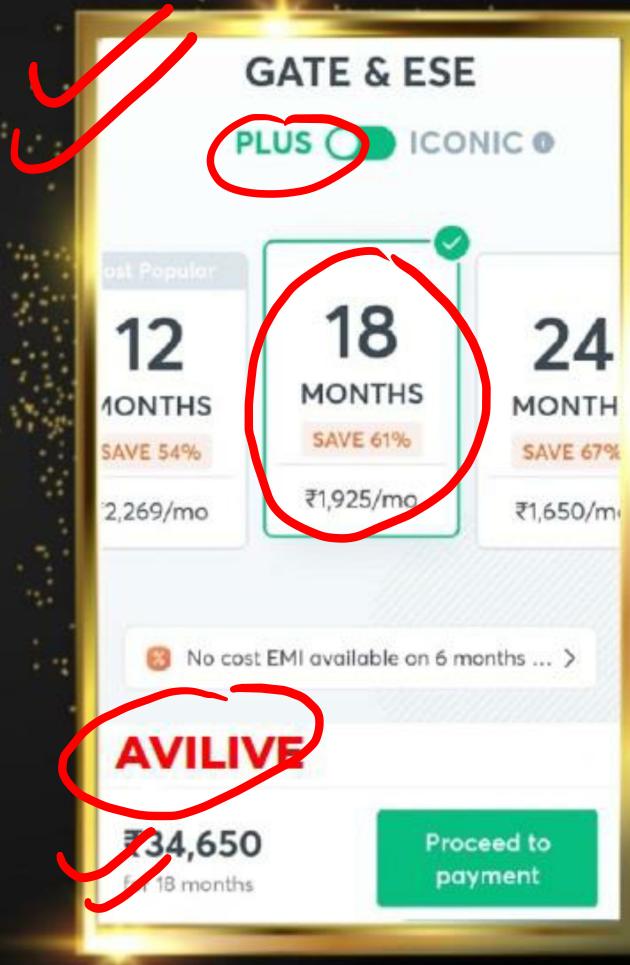
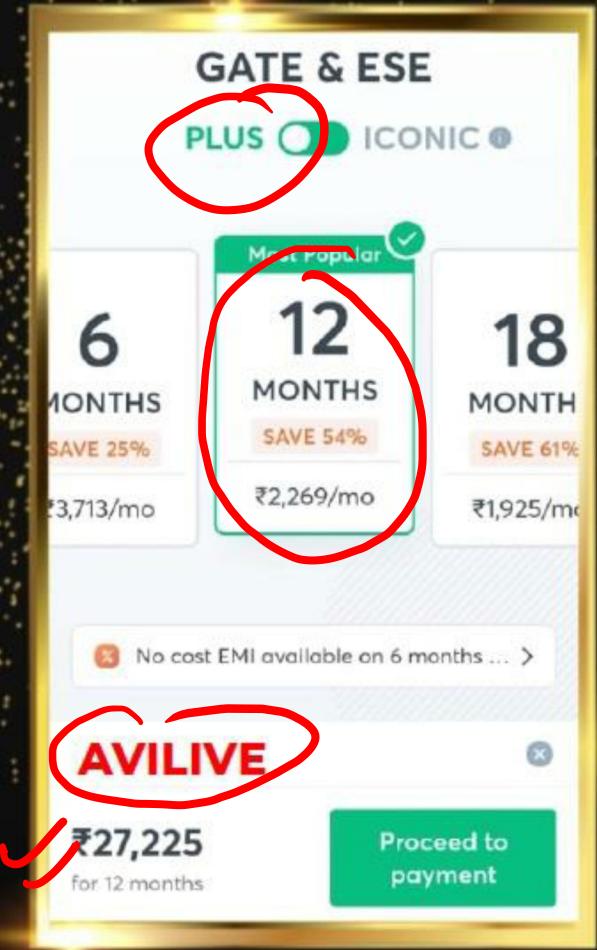
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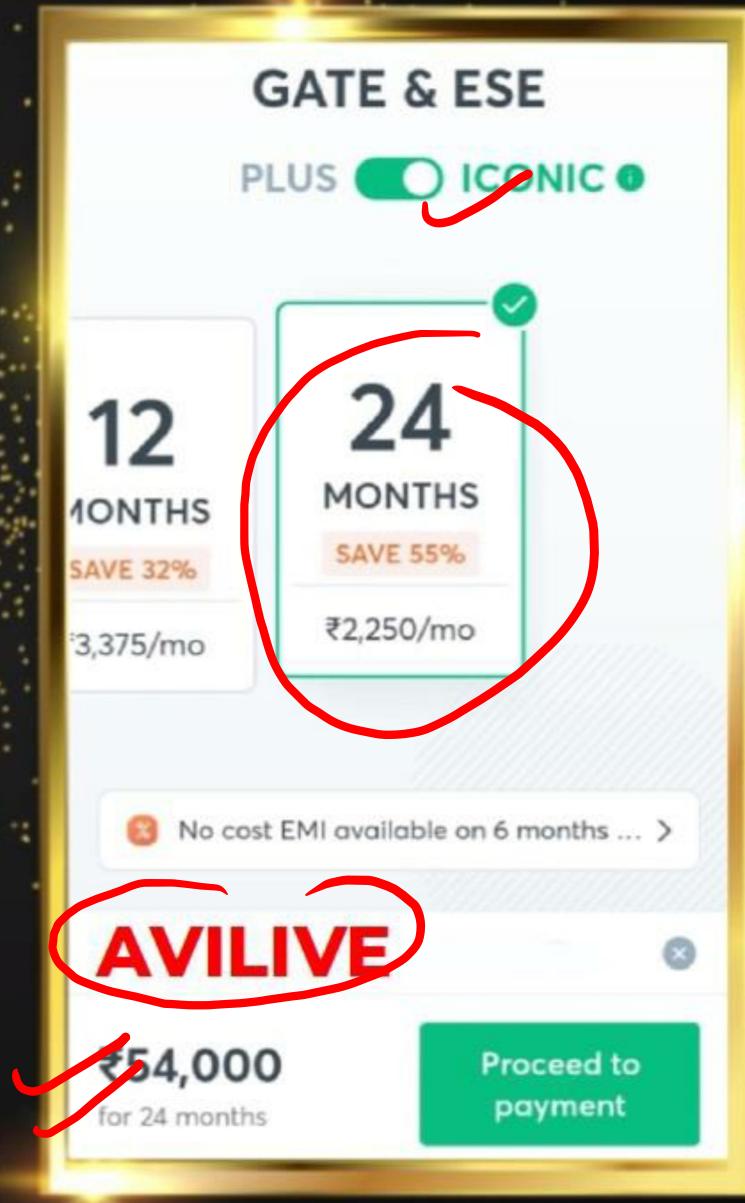
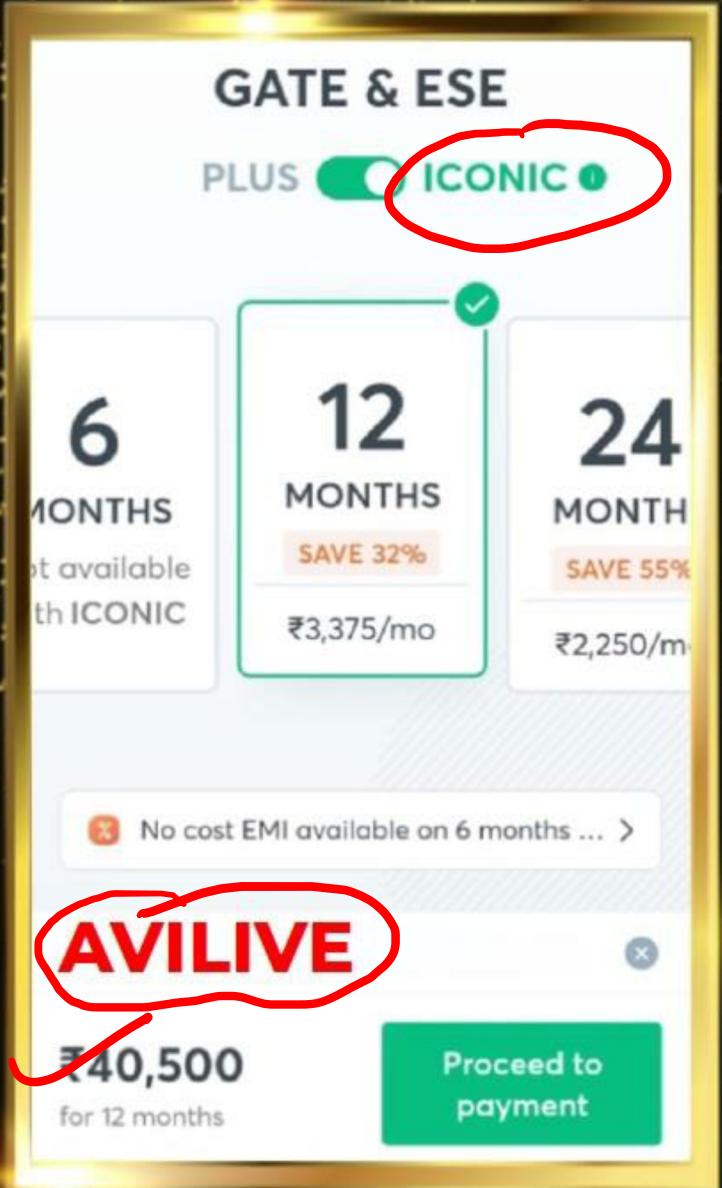
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- REINFORCED CEMENT CONCRETE (RCC)** (Second Row, Middle): Instructor - Aishwary Sir
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- ENVIRONMENTAL ENGG** (Bottom Middle Left): Instructor - Mrigank Saurav Sir
- ENGINEERING HYDROLOGY** (Bottom Middle Right): Instructor - Chetan Sir
- HIGHWAY ENGINEERING** (Bottom Right): Instructor - Kshitij Sachan Sir





Analytical Aptitude

- Venn Diagram
- Syllogism
- Series
- Coding & Decoding
- Odd Man out
- Distance & Direction
- Blood Relation
- Seating Arrangements
- Clock & Calendar

S. w

Quantitative Aptitude

- Number System
- Sequence & Series
- Ratio & Proportion
- Time, Speed & Distance
- Percentage
- Profit, Loss & Discount
- Average
- Allegation & Mixture
- Time & Work
- Powers, exponents and logarithms
- Algebra
- Permutation & Combination
- Probability
- Data Interpretation
- Mensuration and geometry

Spatial Aptitude

- Shape Matching - Two Dimensional
- Visual Comparison - Two Dimensional
- Group Rotation – Two Dimensional
- Combining Two Dimensional Shapes
- Cube Views in Three Dimensions
- Cubes in Two and Three Dimensions
- Other Solids in Two and Three Dimensions
- Block Counting in Three Dimensions
- Two-Dimensional Mirror Reflections
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TIME & WORK

EC | EE | ME | CE | IN | CS | CH

2010 (IIT Guwahati)

Number of
question - 1

2011 (IIT Madras)

Number of
question - 1

2012 (IIT Delhi)

Number of
question - 0

2013 (IIT Bombay)

Number of
question - 1

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Number of
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Concept of $M \times D \times H$

5 Man \rightarrow 10 Day
Single Person's
efficiency

Where,

$$n = \frac{W}{M \times D \times H}$$

~~W~~ = Work

~~M~~ = No of Men/Women/Machine/~~Robot~~

~~D~~ = No of days to Complete work

~~H~~ = No of hours/Day $= 1$

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✓ 1) If 100 cats can kill 100 rats in 100 days, In how many days 10 cats can kill 10 rats.

A) 10

B) 100

C) 1000

D) Can't determine

$$\eta_1 = \frac{w_1}{m_1 D_1 s_1}$$

$$w_1 = 100 \text{ Rats}$$

$$m_1 = 100 \text{ Cats}$$

$$D_1 = 100 \text{ Days}$$

$$s_1 = 1$$

$$\eta_2 = \frac{w_2}{m_2 D_2 s_2}$$

$$w_2 = 10 \text{ Rats}$$

$$m_2 = 10 \text{ Cats}$$

$$D_2 = 1$$

$$s_2 = 1$$

$$\eta_1 = \eta_2$$

$$\frac{w_1}{m_1 D_1 s_1} = \frac{w_2}{m_2 D_2 s_2}$$

$$\frac{100}{100 \times 100 \times 1} = \frac{10}{10 \times 10 \times 1}$$

$$D = 100$$

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Q) 14 workers make 17 boxes in 6 days. How many workers are required to make 289 boxes in 42 days?

A) 14

B) 17

C) 34

D) 6

$$W_1 = 17$$

$$D_1 = 6$$

$$M_1 = 14$$

$$W_2 = 289$$

$$M_2 = M$$

$$D_2 = 42$$

$$\frac{W_1}{M_1 D_1 N_1} = \frac{W_2}{M_2 D_2 N_2}$$

$$\frac{17}{14 \times 6 \times 1} = \frac{289}{M \times 42 \times 1}$$

$$M = 34$$

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3) Seven machines take 7 minutes to make 7 identical toys. At the same rate, how many minutes would it take for 100 machines to make 100 toys?

[GATE 2018, 1 MARK (ME)]

- A) 1
- B) 7
- C) 100
- D) 700

$$\cancel{7 \times T} = \cancel{\frac{1 \text{ toy}}{10 \times T}} \Rightarrow T = \cancel{7}$$

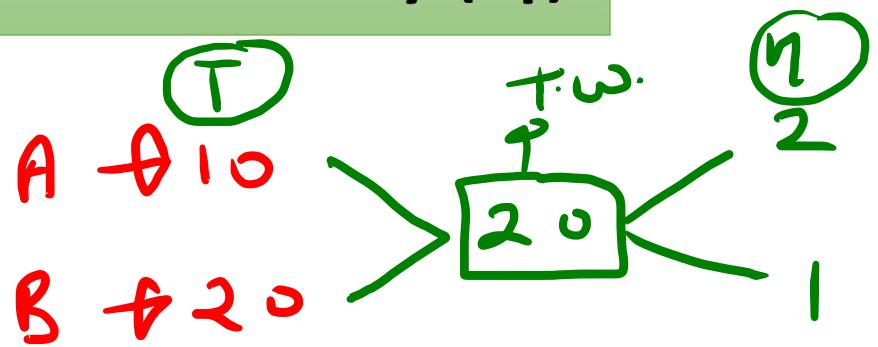
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Efficiency(η)



$$\begin{array}{c} A \circ B \\ T \nabla \end{array} \quad | \quad \begin{array}{c} A \circ B \\ \eta \nabla 2 \circ 1 \\ \hline \end{array}$$

Below the first row, the ratio $1 : 2$ is underlined. Below the second row, the ratio $2 : 1$ is underlined.

$$\eta \times T = \text{work}$$

$w = \text{constant}$

$$\eta \propto \frac{1}{T}$$

$$\frac{\eta_1}{\eta_2} = \frac{T_2}{T_1}$$

$$\left. \begin{array}{c} A \\ B \\ T \nabla 3 \circ 4 \\ \eta \nabla 4 \circ 3 \end{array} \right\} \quad \begin{array}{c} \star \star \\ \text{Work} \\ \leftarrow \text{constant} \end{array}$$

$$\begin{array}{c}
 A : 1 : 2 : 3 \\
 B : 2 : 3 : 4 \\
 C : 3 : 2 : 1
 \end{array}$$

$\eta \rightarrow$
 $T \rightarrow 3 : 2 : 3 + X$
 $T \rightarrow \frac{1}{1} : \frac{1}{2} : \frac{1}{3}$
 $(1 : \frac{1}{2} : \frac{1}{3}) \times 6$
 $T \rightarrow 6 : 3 : 2$

$$\begin{array}{c}
 A : 2 : 3 : 4 \\
 B : 1 : 3 : 4 \\
 C : 1 : 4 : 3
 \end{array}$$

$\eta \rightarrow$
 $T \rightarrow \left(\frac{1}{2} : \frac{1}{3} : \frac{1}{4} \right) \times 12$
 $6 : 4 : 3$

Efficiency(η)

- ✓ The efficiency of A is twice than B
- ✓ A is twice as productive as B
- ✓ A works twice as fast B

$$\left. \begin{array}{l} \eta \\ T \end{array} \right\} \rightarrow \begin{array}{c} A \quad B \\ 2 : 1 \\ 1 : 2 \end{array}$$

- Efficiency of C is thrice than A & B both

$$h \rightarrow \begin{array}{c} C \quad A+B \\ 3 : 1 \end{array}$$

- A is 60% more efficient than B

$$\rightarrow \begin{array}{c} A \quad B \\ (10+6) : 10 \end{array}$$

- P takes 50% more times than Q

$$\begin{array}{c} 6 : 5 \\ 8 : 5 \end{array}$$

✓ 4) Ajeet works thrice as fast Kapil. If both of them can together finish the work in 12 days. Then Ajeet alone can do it?

A) 48

B) 32

C) 16

D) NOTA

$$A \quad K$$
$$\eta \rightarrow 3 : 1$$

$$A + K = (3+1) = 4$$

$$A + K \rightarrow 12 \text{ Day}$$

$$T \cdot \omega = 4 \times 12$$

$$T_A = \frac{4 \times 12}{3} = 16 \text{ Days}$$

$$T_K = \frac{4 \times 12}{1} = 48 \text{ Day}$$

✓ 5) A is twice as efficient as B. If they take 6 days to finish a certain job together, how much time will they individually take to complete the work?

A) 9, 18

B) 9, 12

C) 18, 9

D) 12, 9

M-T

$\eta \rightarrow$

A B
2 : 1

1 6 2

M-T

$\eta \rightarrow$ A B
 2 : 1
 $A + B \rightarrow ③$ ---
 $A + B \rightarrow 6 \text{ Day}$

$T \cdot w = 18$

$$T_A = \frac{18}{2} = 9 \text{ Day}$$

$$T_B = \frac{18}{1} = 18 \text{ Day}$$

✓) A can do a certain job in 12 days. B is 60% more efficient than A. How many days does B alone take to do the same job?

A) 7

B) 7.5

C) 8

D) 8.5

$$A \rightarrow 12 \text{ Day}$$

$$T \cdot w = 12 \times 5 \\ = 60$$

$$\eta \rightarrow \begin{matrix} B & A \\ (10+6) : 10 \\ 16 : 10 \\ 8 : 5 \end{matrix}$$

$$T_B = \frac{60}{8} = \frac{30}{5} = \frac{15}{2} = 7.5$$

✓ 7) The efficiency of A is twice than B and efficiency of B is thrice than C. If they together can do the total work in 10 days. In how many days C alone will do the work.

A) 80

B) 90

C) 100

D) NOTA

$$\eta \rightarrow \begin{array}{c} A : B \\ (2 : 1) \times 3 \\ G : 3 \end{array} \quad | \quad \eta \rightarrow \begin{array}{c} B : C \\ 3 : 1 \end{array} \quad | \quad A + B + C \rightarrow \underline{\underline{10}} \text{ Day}$$

Join

$\boxed{C \Rightarrow 2}$

$$\eta \rightarrow \begin{array}{c} A : B : C \\ 6 : 3 : 1 \\ A + B + C = 10 \end{array}$$

$$T.W = 10 \times 10 = \underline{\underline{100}}$$

$$T_C = \frac{100}{1} = \underline{\underline{100}} \text{ Day}$$

$$T_A = \frac{100}{6}$$

$$T_B = \frac{100}{3}$$

✓) To complete a work, P takes 50% more times than Q. If together they take 18 days to complete the work, how much time shall Q take to do it?

- (A) 30 days (B) 35 days

[RRB-2014(JE), BILASPUR]

- (C) 40 days (D) 45 days

$$\begin{array}{c} P \quad Q \\ T \rightarrow (2+1) \div 2 \\ T \rightarrow \frac{3}{2} \\ \eta \rightarrow \frac{2}{3} \end{array}$$

$$P+Q \rightarrow 18 \text{ Days}$$

$P+Q \rightarrow 5 \text{ units}$ | $T \cdot \omega = 18 \times 5$

$$T_Q = \frac{18 \times 5}{3} = 30 \text{ Days}$$

$$T_P = \frac{18 \times 5}{2} = 45 \text{ Days}$$

~~Home Work Question~~

NDT

How many men will be required to plough 100 acres of land in 10 days. If 10 men required 8 days to plough 20 acres of land?

Ans:-

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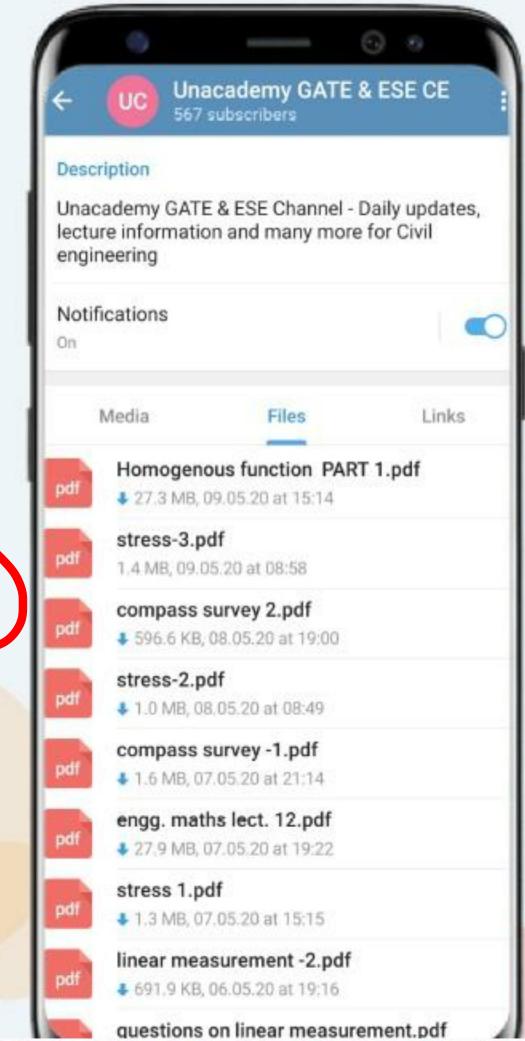
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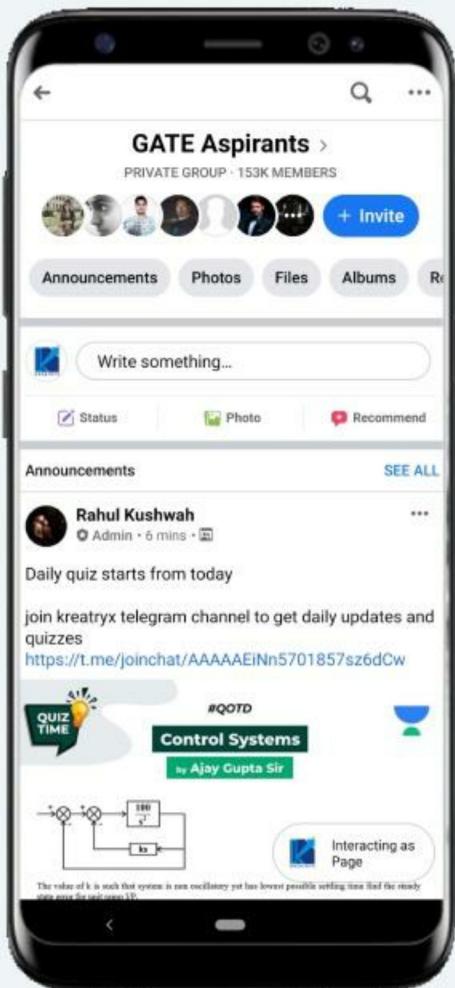
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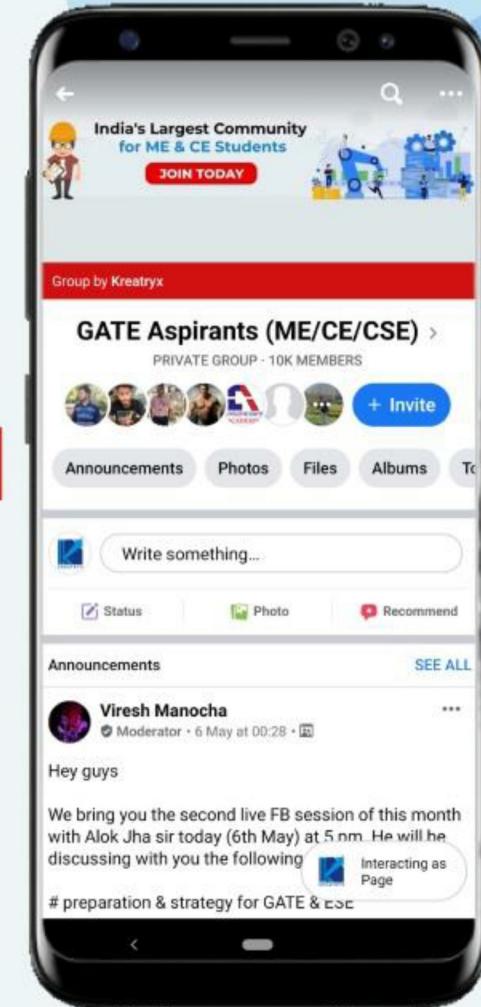
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