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GATE/IESE/PSUs

NUMERICAL APTITUDE

FOR ALL EXAM

Time & Work -1
(Basic Concept)

LECTURE - 1

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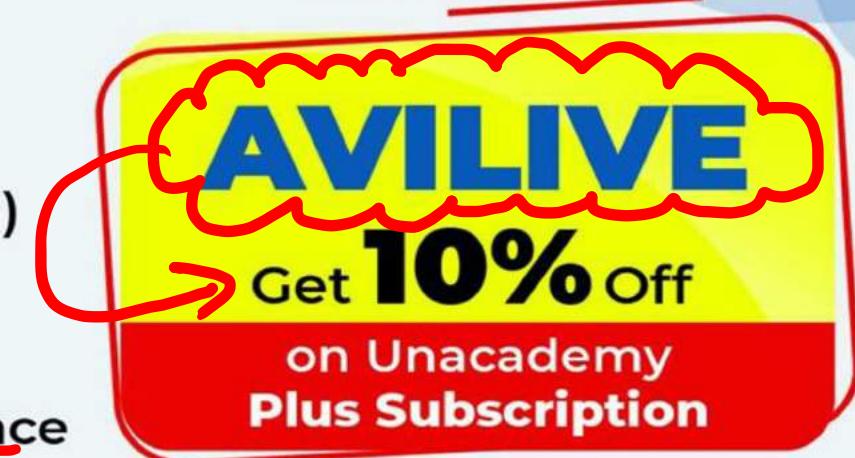
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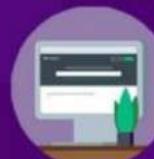
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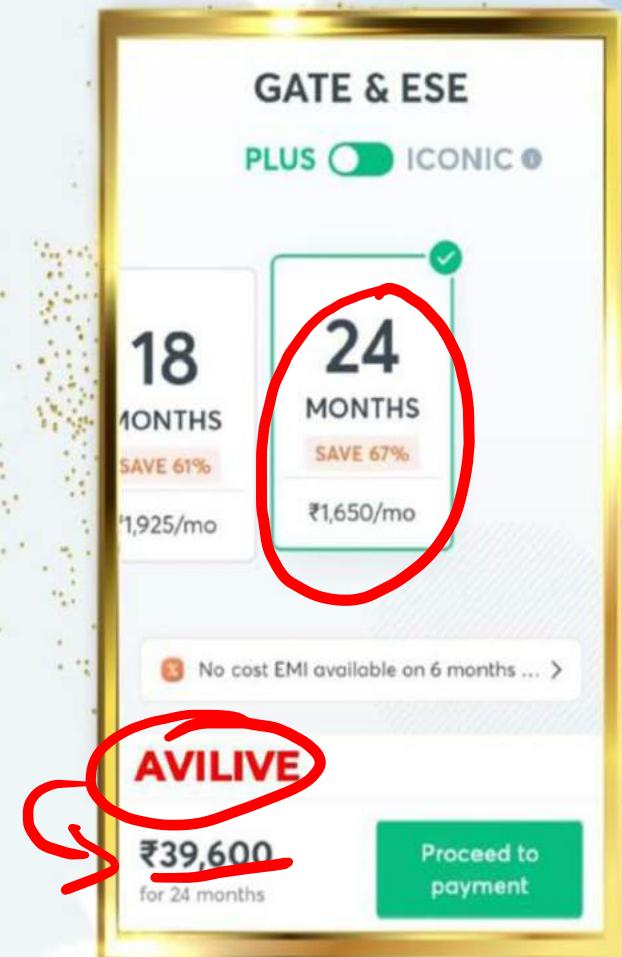
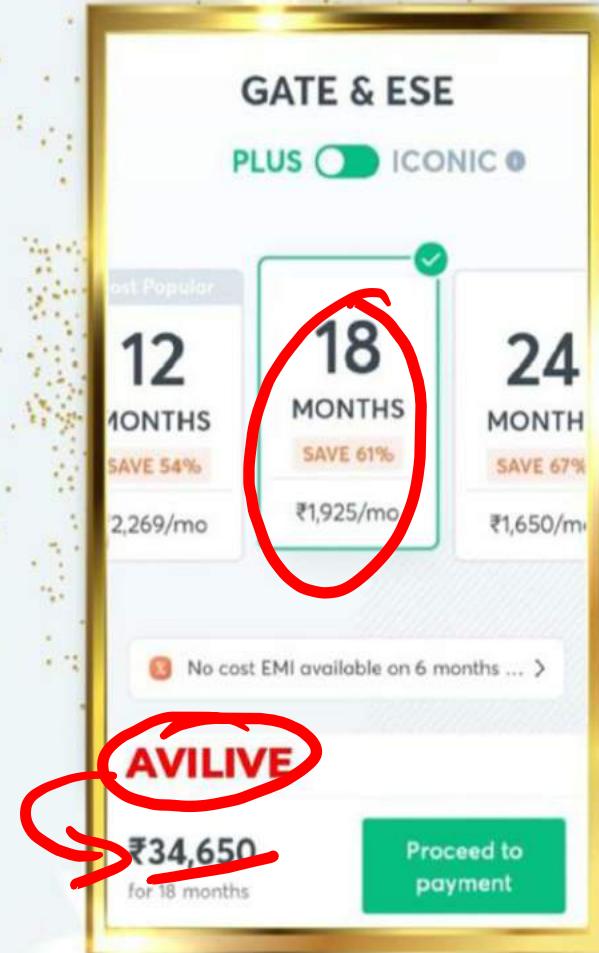
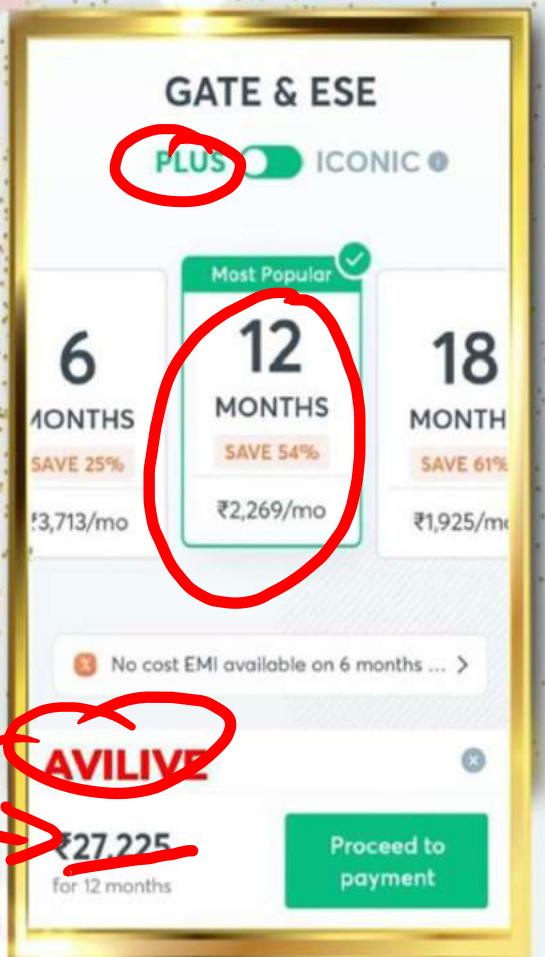


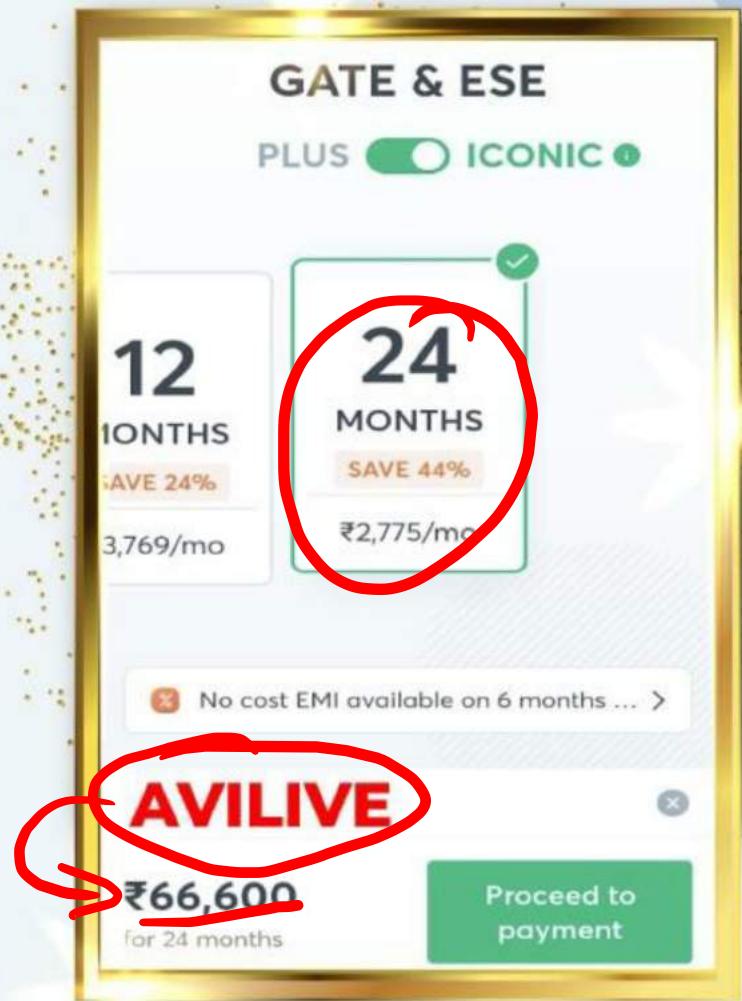
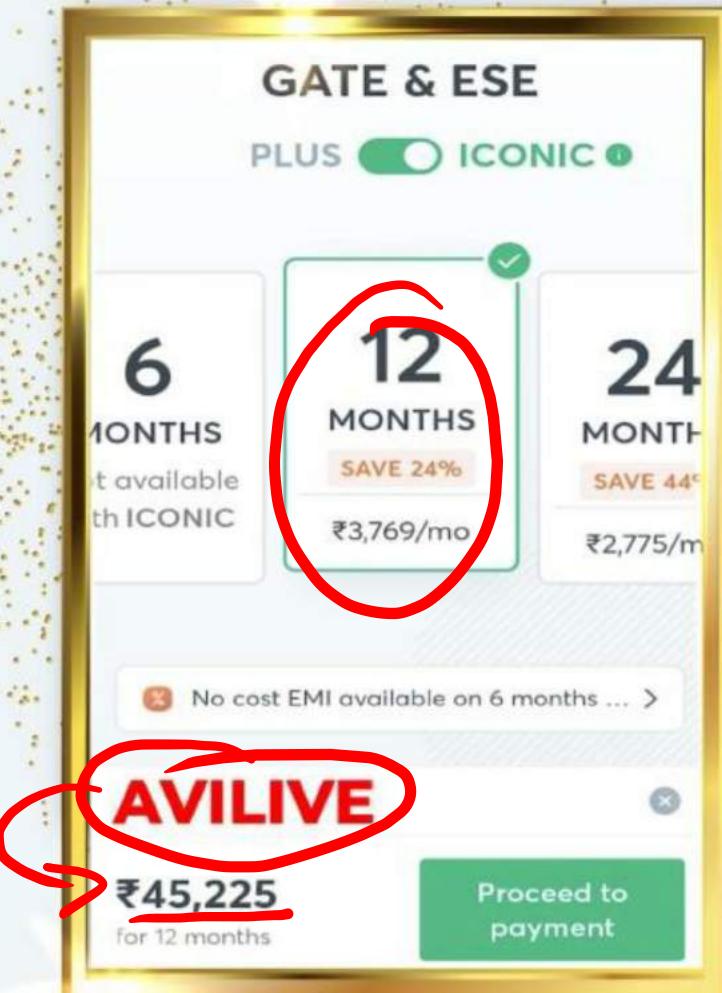
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Topic wise detail analysis of Revised Aptitude Syllabus

GATE 2022/23

Old Syllabus	New Syllabus
Verbal Ability: English grammar, sentence completion, verbal analogies, word groups, instructions, critical reasoning and verbal deduction.	Verbal Aptitude Basic English grammar: tenses, articles, adjectives, prepositions, conjunctions, verb-noun agreement, and other parts of speech Basic vocabulary: words, idioms, and phrases in context Reading and comprehension Narrative sequencing
Numerical Ability: Numerical computation, numerical estimation, numerical reasoning and data interpretation.	Quantitative Aptitude Data interpretation: data graphs (bar graphs, pie charts, and other graphs representing data), 2- and 3-dimensional plots, maps, and tables Numerical computation and estimation: ratios, percentages, powers, exponents and logarithms, permutations and combinations, and series Mensuration and geometry, Elementary statistics and probability
	Analytical Aptitude Logic deduction and induction Analogy Numerical relations and reasoning
	Spatial Aptitude Transformation of shapes: translation, rotation, scaling, mirroring, assembling, and grouping Paper folding, cutting, and patterns in 2 and 3 dimensions

GATE-2022/23

General Aptitude

Quantitative
Aptitude

AT
Complete

Analytical
Aptitude

II: α P M

Verbal
Aptitude

Spatial
Aptitude

Numerical Ability(Old)

Numerical computation,
numerical estimation,
numerical reasoning and
data interpretation.

Quantitative Aptitude(New)

Data interpretation: data graphs (bar graphs, pie charts, and other graphs representing data), 2- and 3-dimensional plots, maps, and tables

Numerical computation and estimation:
ratios, percentages, powers, exponents
and logarithms, permutations and
combinations, and series

Mensuration and geometry,
Elementary statistics and probability

All
Branch

Topic wise Numerical 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

Previous
year
awards

M PCL
I FCCI L

Theory + Concept + Practice

Time & Work

Type-I

Basic concept

Type-II

Left the work-before/After(One left another join)

Type-III

Concept of ratio with efficiency

Type-IV

Alternate days concepts

Type-V

Men, Women, children based concept (AND/OR)

Type-VI

MDH Concept

➤ Previous Year Asked Questions

JIG

3ST
DST

➤ GATE/ESE/PSUs/AE/JE



Today Class Agenda

Basic Concept of Time & Work

Practice Some Questions Based on Time & Work

Time & Work

$$\rightarrow \eta \times T = \text{Work}$$

→ LCM Method ✓

→ %age Method ✓

→ Common Sense Method ✓

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eg

$$A \rightarrow 10 \text{ Days}$$

$$B \rightarrow 20 \text{ Days}$$

$$A+B \rightarrow ?$$

Soln

$$\text{Work} = 1 \text{ unit}$$

fix

efficiency of A

$$A \rightarrow 10 \text{ Day} \rightarrow \frac{1}{10} \text{ th per Day}$$

efficiency of B

$$B \rightarrow 20 \text{ Day} \rightarrow \frac{1}{20} \text{ th per Day}$$

$$A+B \rightarrow \left(\frac{1}{10} + \frac{1}{20} \right) \text{ th per Day}$$

$$= \frac{3}{20} \text{ Per Day}$$

$$\text{Time} = \frac{1}{\frac{1}{3/20}} = \frac{20}{3} \text{ Days}$$

$$\rightarrow \text{Time} = \frac{\text{Work}}{\text{efficiency}}$$

$$\boxed{T \times y = \text{work}}$$

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LCM Method

A \rightarrow 10
B \rightarrow 20

$$\text{Work} = \text{LCM of } (10, 20)$$

$$= 20 \text{ Unit}$$

Variable

$$A \rightarrow 10 \text{ Day} \quad 2 \text{ Unit/Day}$$

$$B \rightarrow 20 \text{ Day} \quad 1 \text{ Unit/Day}$$

$$A + B \rightarrow (1+2) \text{ Unit/Day}$$

$$= 3 \text{ Unit/Day}$$

$$\text{Time} = \frac{20}{3} \text{ Day}$$

efficiency of A

efficiency of B

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

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% Method

A \rightarrow 10 Days

B \rightarrow 20 Days

Work = 100 %

A \rightarrow 10 Days

B \rightarrow 20 Days

A + B \rightarrow (10% + 5%) per Day

= 15% per Day

Fix

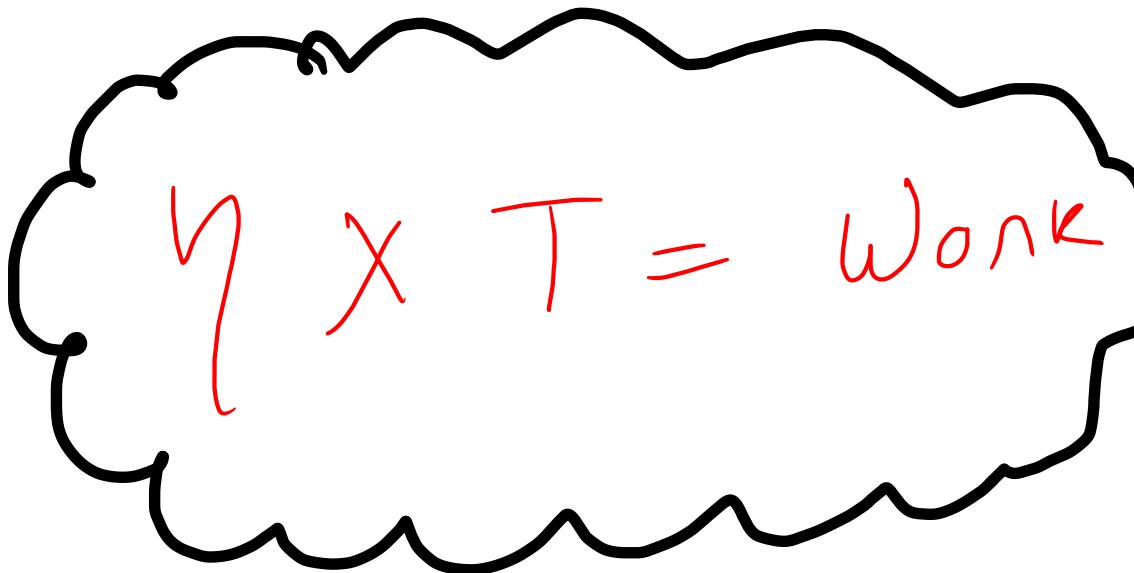
efficiency of A

10% per Day

5% per Day

efficiency of B

$$T = \frac{100}{15} = \frac{20}{3} \text{ Days}$$



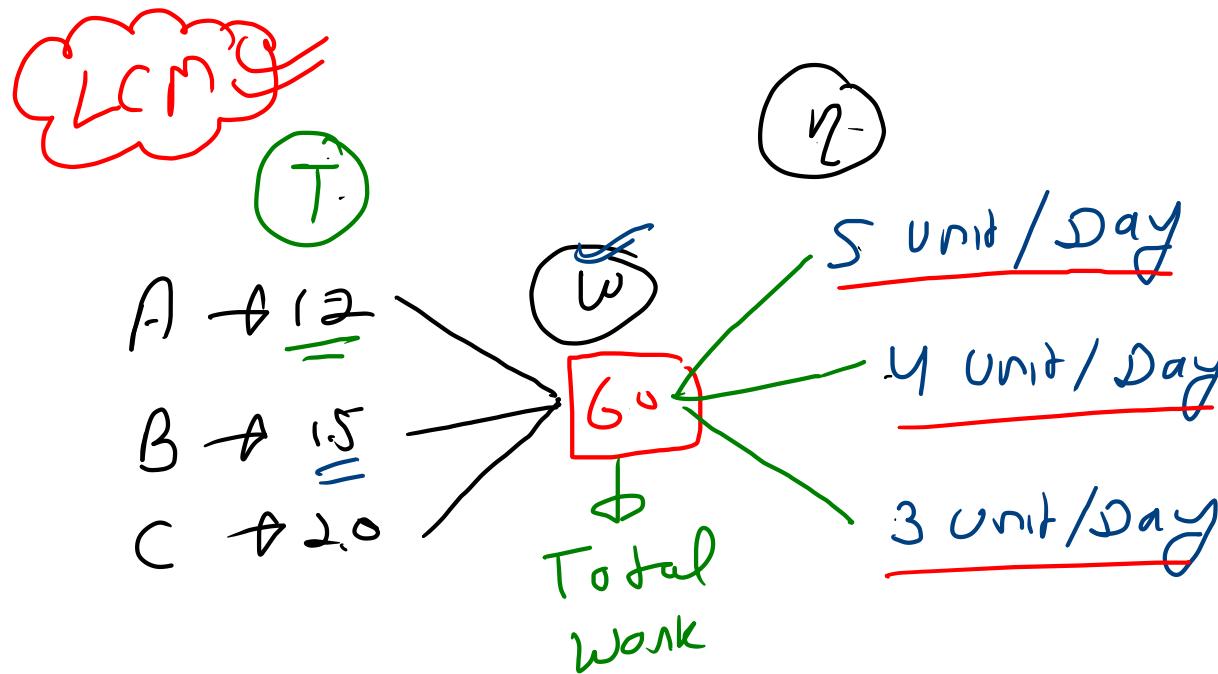
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~~A → 12 Days~~

~~B → 15 Days~~

~~C → 20 Days~~

$$A + B + C = ?$$



$$\begin{aligned} A + B + C &= (5 + 4 + 3) \text{ unit / Day} \\ &= 12 \text{ unit / Day} \end{aligned}$$

$$\text{Time} = \frac{60}{12} = 5 \text{ Day}$$

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$$A \rightarrow \frac{100}{12} = 8\frac{1}{3}\% \quad \checkmark$$
$$B \rightarrow \frac{100}{15} = 6\frac{2}{3}\%. \quad \checkmark$$
$$C \rightarrow \frac{100}{20} = 5\%. \quad \checkmark$$

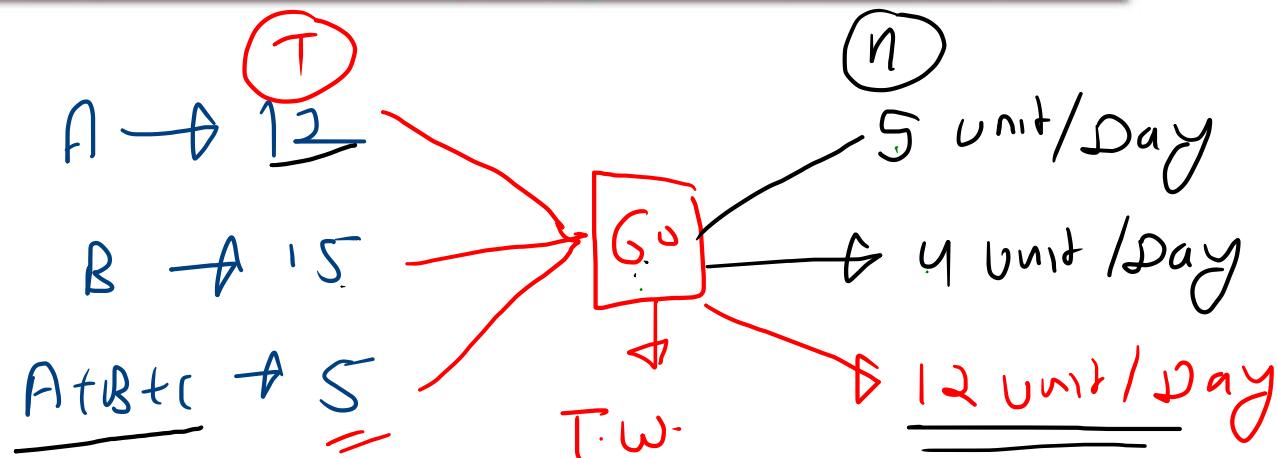
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~~A~~ → 12 Day

~~B~~ → 15 Day

~~A + B + C~~ → S Day

C → ?



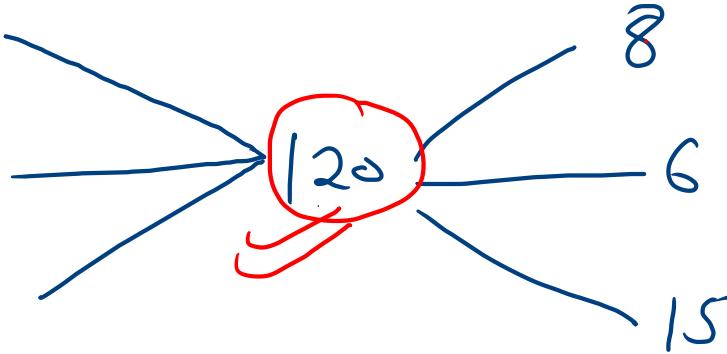
$$A + B + C \rightarrow 12 \text{ unit/day}$$
$$\underbrace{5}_{=} \underbrace{4}_{=} \underbrace{3}_{=}$$

$$Y_C = 3 \text{ unit/day}$$

$$T_C = \frac{60}{3} = 20 \text{ Day}$$

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$A \rightarrow 15$
 $B \rightarrow 20$
 $A+B+C \rightarrow 8$



$\{ A + B + C = 15^-$
 $\eta_C = \underline{\underline{1 \text{ unit}}}$

$C \rightarrow ?$

$$T_C = \frac{120}{1} = \underline{\underline{120 \text{ Day}}}$$



1) If A and B together can complete a piece of work in 15 days and B alone in 20 days, in how many days can A alone complete the work?

- a) 60
- b) 45
- c) 40
- d) 30

$$\begin{array}{ccc} A+B \rightarrow 15 & \text{---} & \eta \\ B \rightarrow 20 & \text{---} & \eta \\ & \text{---} & \text{---} \\ & 60 & \end{array}$$

Diagram illustrating the work rate calculation:

- A + B together complete 1 unit of work per day.
- B alone completes 1 unit of work per day.
- Their combined work rate is 60 units of work per day.
- Therefore, A alone completes 60 units of work per day.

$$\begin{aligned}\eta_A &= 1 \text{ unit/Day} \\ T &= \frac{60}{1} = 60 \text{ Day}\end{aligned}$$



1) If A and B together can complete a piece of work in 15 days and B alone in 20 days, in how many days can A alone complete the work?

- a) 60
- b) 45
- c) 40
- d) 30

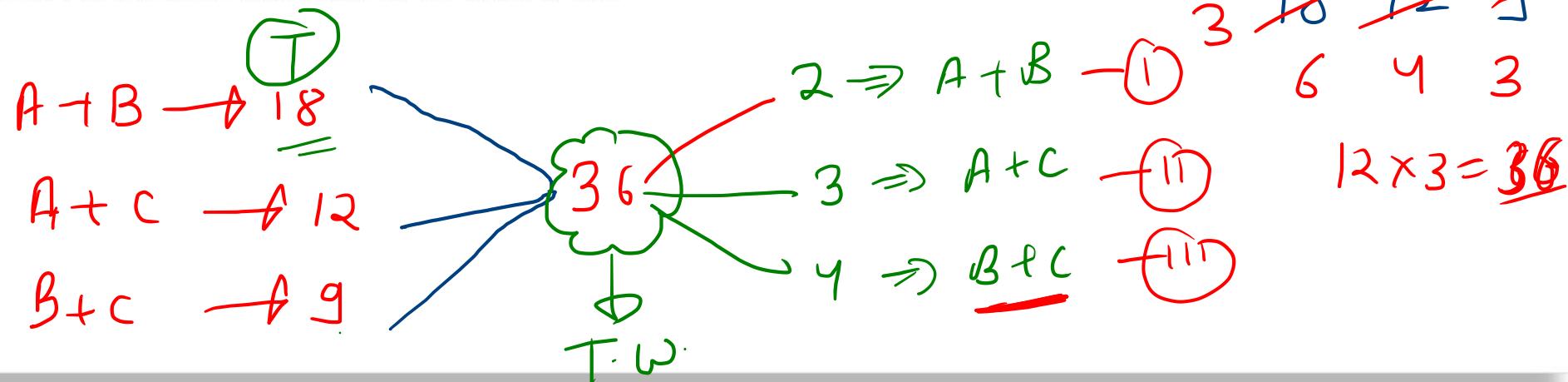
$$\begin{array}{ccc} A+B \rightarrow 15 & \text{---} & \eta \\ B \rightarrow 20 & \text{---} & \eta \\ & \text{---} & \text{---} \\ & 60 & \end{array}$$

Diagram illustrating the work rate calculation:

- A + B together complete 1 unit of work per day ($\frac{1}{15}$).
- B alone completes 1 unit of work per day ($\frac{1}{20}$).
- Their combined work rate is $\frac{1}{15} - \frac{1}{20} = \frac{1}{60}$.
- Therefore, A alone completes $\frac{1}{60}$ units of work per day.
- To complete 1 unit of work, A alone requires 60 days.

2) If A and B together can complete a work in 18 days, A and c together in 12 days, and B and C together in 9 days, then B alone can do the work in:

- a) 18 days
- b) 24 days
- c) 30 days
- d) 40 days



$T_A = 36 / \frac{9}{2} - 4 = 72$

$T_B = 36 / \frac{9}{2} - 3 = 24 \text{ days}$

$T_C = 36 / \frac{9}{2} - 2 = 12 \text{ days}$

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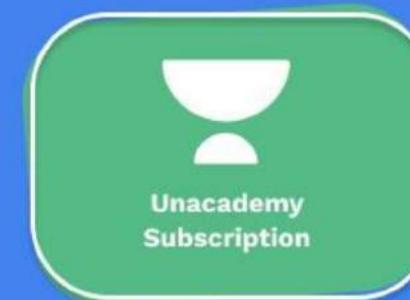
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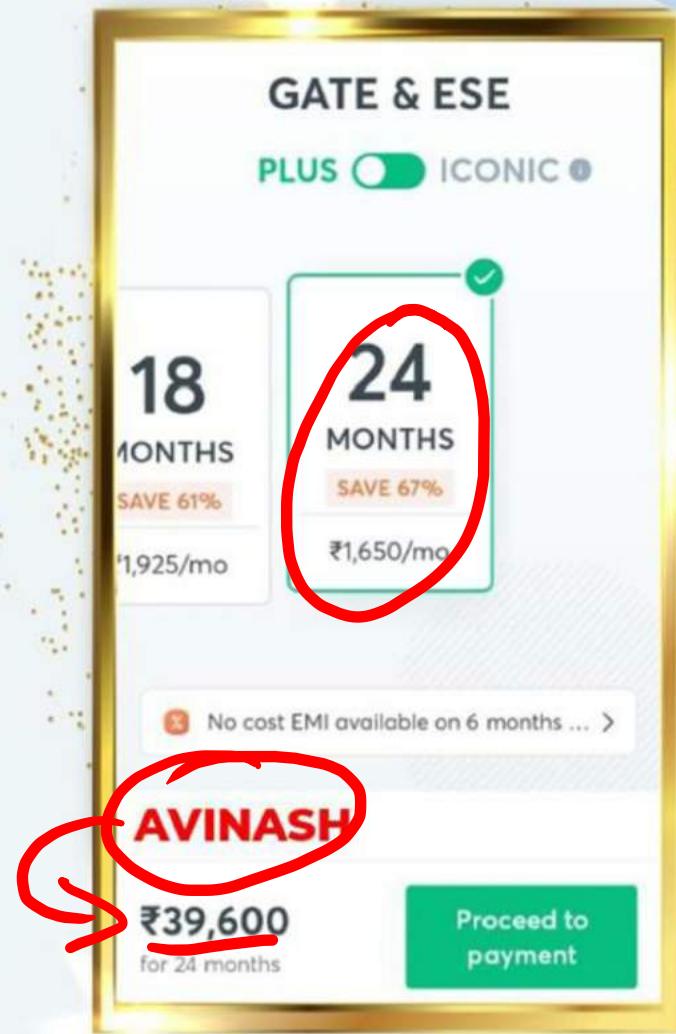
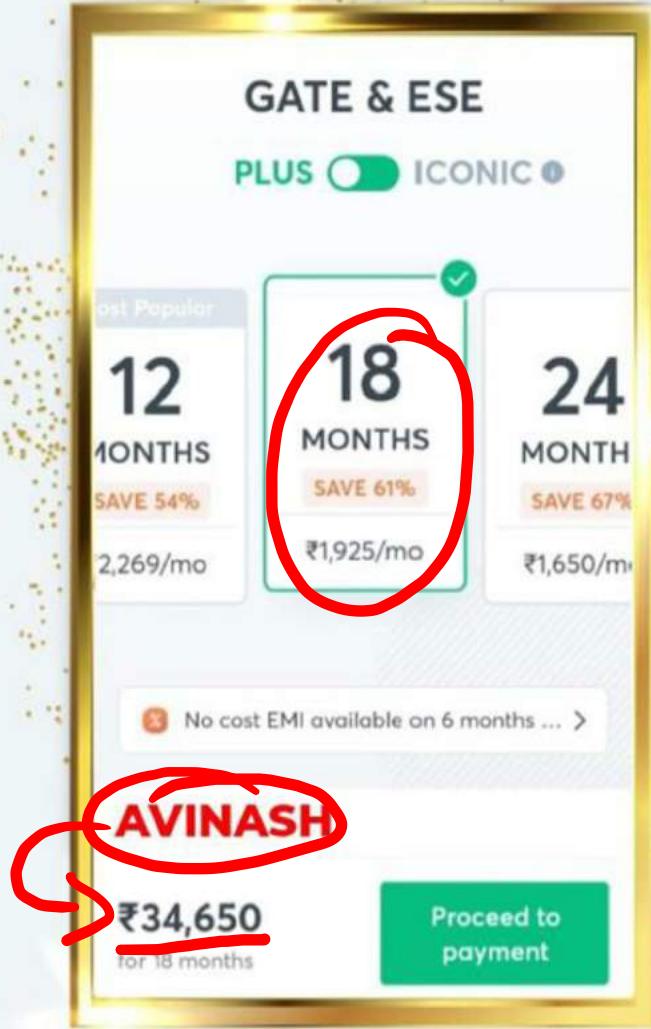
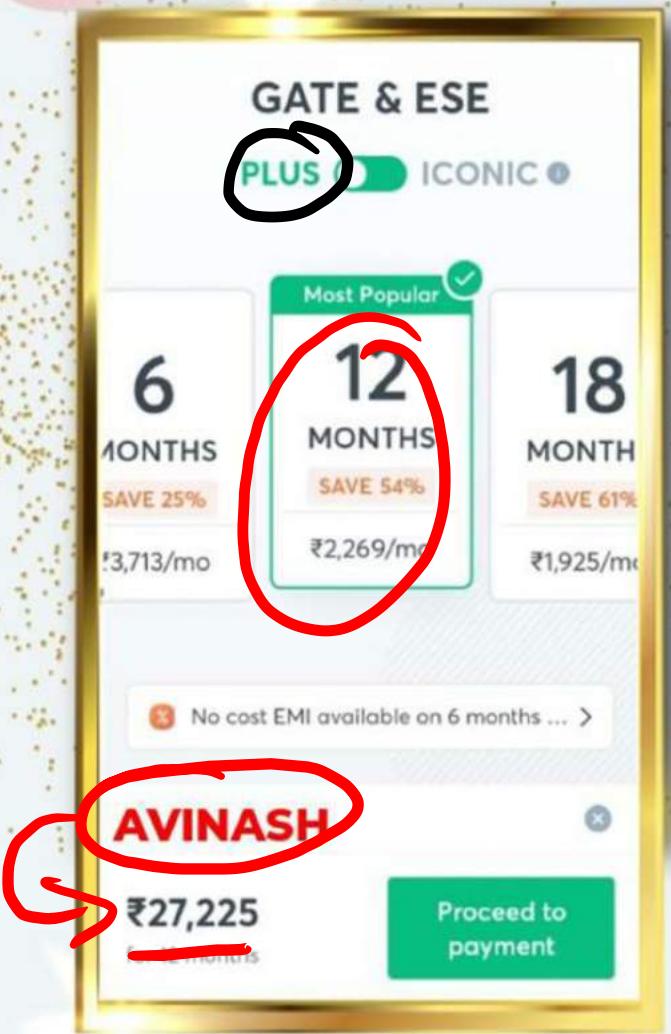


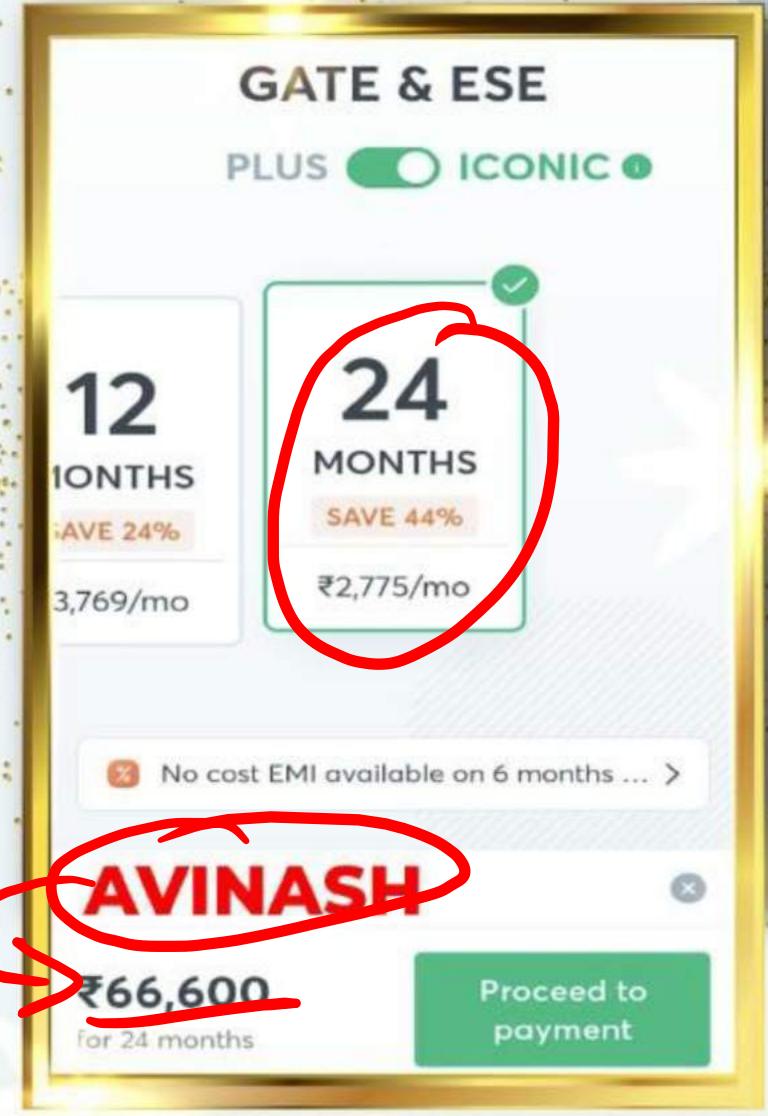
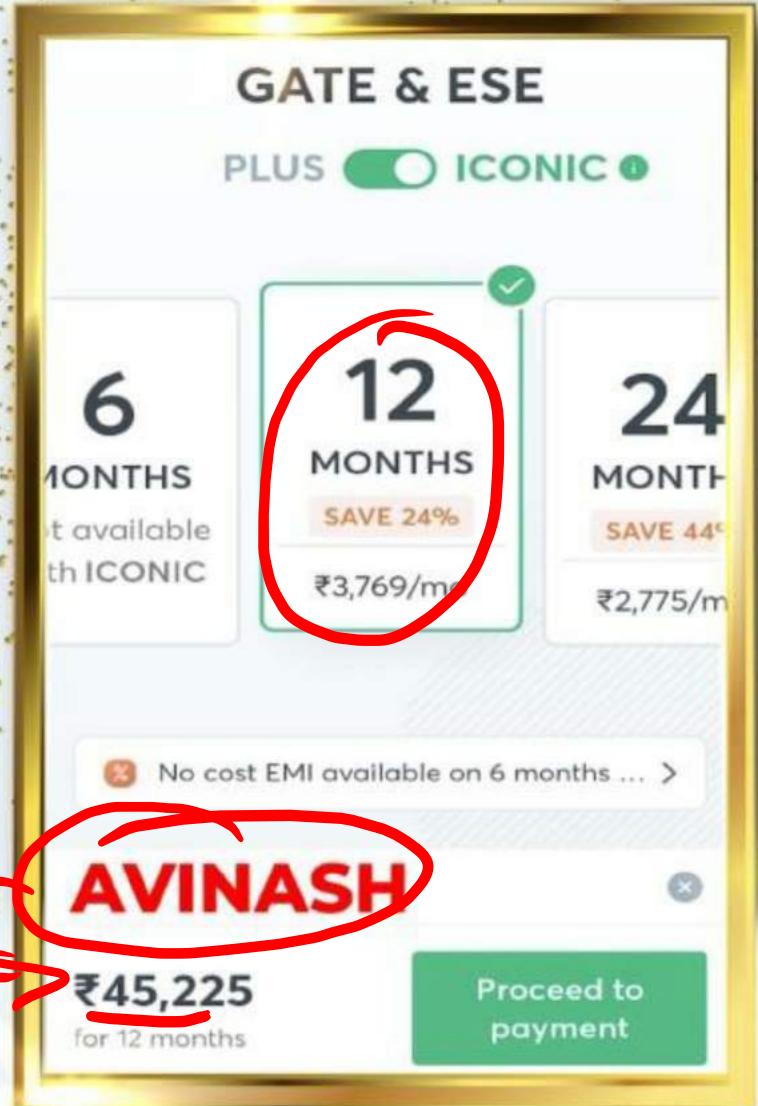
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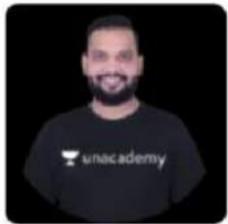
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- Worked at GATE ACADEMY
- Cracked GATE Exam Multiple time
- Lives in Durg, Chhattisgarh, India
- Unacademy Educator since 29th September, 2020
- 35,900 live minutes taught in last 30 days
- Knows Hindi and English

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