GATE
ALL BRANCHES

General Aptitude
QUANTITATIVE APTITUDE

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Recap of Previous Lecture

Topic — Profit Loss

Topics to be Covered

Topic-1   Mixtures Alligations

Topic-2   Number System (Basics)

#Q. A shopkeeper advertises for selling cloth at 4% loss. However by using a false meter scale he actually gains 25%. What is actual length of scale?

Assignment

A   76.8 cm

B   77.8 cm

C   74.8 cm

D   75.8 cm

$$\frac{S.P}{C.P}$$

$$0.96 \times \frac{100}{x} = 1.25$$

$$\frac{96}{1.25} = x = 76.8 \text{ cm}$$

#Q. A man sells an article at a profit of 20%. If he had bought it at 10% less and sold it for Rs. 18 more, he would have gained 40%. Find the cost price of the article.

Assignment

$$\frac{S.P}{C.P} = 1.2 \implies S.P = 1.2\ C.P$$

$$\frac{S.P + 18}{0.9\ C.P} = 1.4 \implies 1.2\ C.P + 18 = 1.26\ C.P$$

$$0.06\ C.P = 18$$

$$\therefore C.P = \frac{18}{0.06} = 300$$

#Q. An article was sold at a profit of 20%. If both cost price and selling price are ₹100 less each, then magnitude of the percentage of profit would have been 4 percentage points more than that in the first case. Then the cost price is

A   ₹ 500

B   ₹ 600

C   ₹ 800

D   None of these

$+4\% = 24\%$

Assignment

$$\frac{S.P}{C.P} = 1.2 \Rightarrow S.P = 1.2\,C.P$$

$$\frac{S.P - 100}{C.P - 100} = 1.24 \Rightarrow 1.2\,C.P - 100 = 1.24\,C.P$$
$$-124$$

$$\Rightarrow 0.04\,C.P = 24$$

$$\therefore C.P = \frac{24}{0.04} = 600$$

[MCQ]

$$\frac{300}{5} = 60/kg = C.P$$

#Q. 5kg of ghee was bought by Vinod for ₹300. One kg from that spoilt. He sells the remaining in such a way that on the whole he incurs a loss of 10%. At what price per kg does he sell the ghee?

Assignment

A ₹ 46.25

B ₹ 45.70

C ₹ 67.50

D ₹ 46.60

$$\frac{S.P}{C.P} = \boxed{\frac{4}{5} \times \frac{x}{60} = 0.9}$$

$$\Rightarrow 4x = 270$$

$$\therefore x = \frac{270}{4} = 67.50$$

#Q. A function hall was filled with 100 guests including men, women and kids. 100 biscuits has to be distributed among these guests, such that each man gets 4 biscuits, each woman as 3 and each kid gets 1/2 biscuits. How many men, women and kids are there in function hall?

$$M + W + K = 100$$

$$\left(4M + 3W + \tfrac{1}{2}K = 100\right) \times 2$$

Assignment

$$8M + 6W + \cancel{K} = 200$$
$$M + W + \cancel{K} = 100$$

$$7M + 5W = 100$$

$$M - 5 \quad \textcircled{$\times 4$} = 20$$
$$W - 13 \quad \textcircled{$\times 3$} = 39$$
$$K - 82 \quad \textcircled{$\tfrac{1}{2}$} = 41$$
$$\underline{100}$$

$$\underline{100}$$

₹ 280

$A \Rightarrow 40/-?$
$B \Rightarrow 11-?$
$C \Rightarrow 0.2 ?$

$M - 10 \qquad 40$
$W - 6 \qquad 18$
$K - 84 \qquad \dfrac{42}{100}$
$$\overline{100}$$

Puzzle:

$A \to 40/-$

$B \to 1/-$

$C \to 0.2/-$

TOTAL Money : 280/-
TOTAL Number of Product : 280

$$A + B + C = 280$$

$$40A + B + 0.2C = 280$$

No.   Cost:

A => 4   160

B => 81   81

C => 195   39
    ___   ___
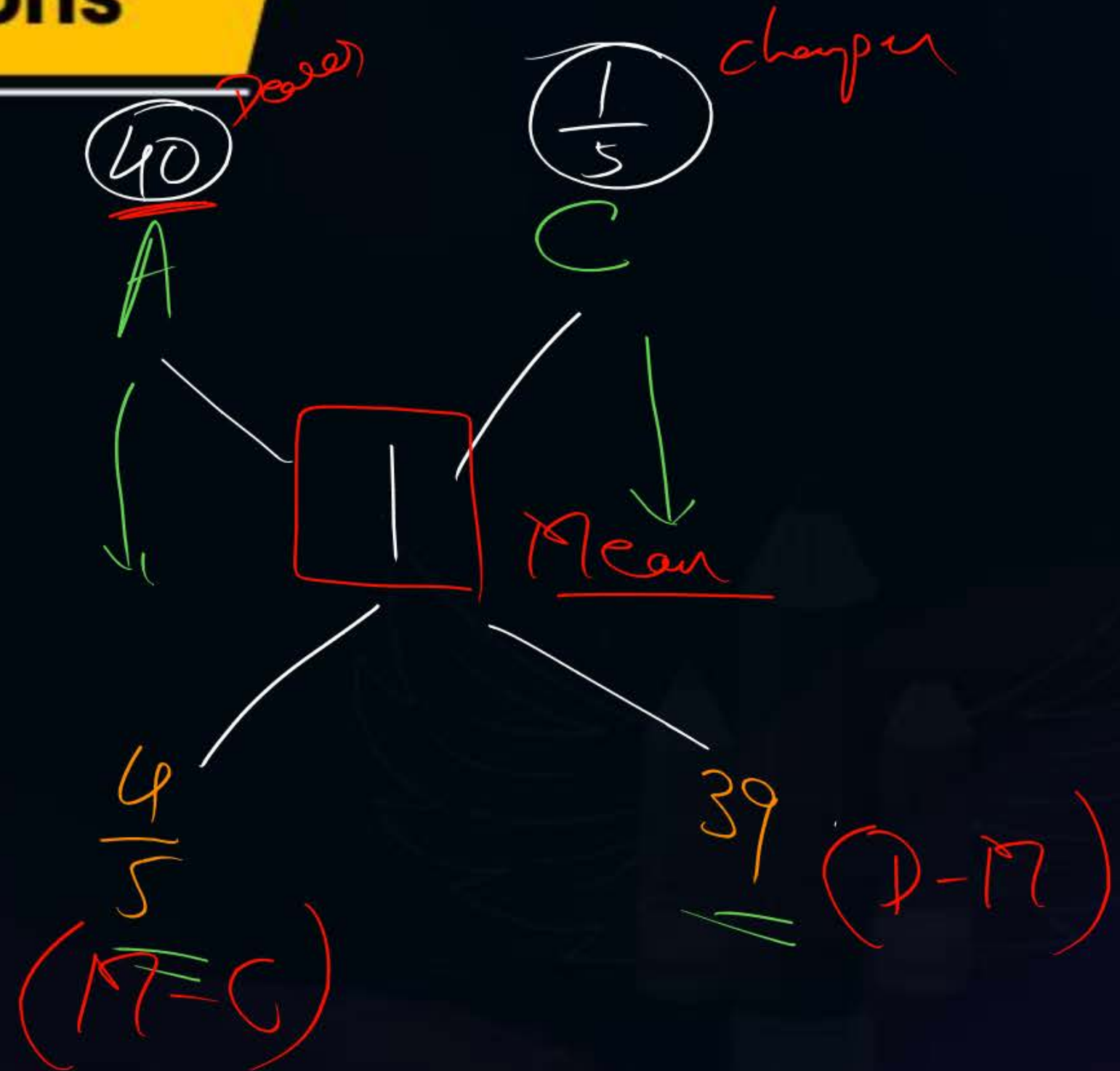   280   280

$$A + B + C = 40A + B + 0.2C$$

$$\boxed{39A = 0.8C}$$

$$\frac{A}{C} = \frac{0.8}{39} = \frac{8}{390} = \frac{4}{195}$$

Mixtures & Alligations

$A:C = \dfrac{4}{5} : 39$

$= 4 : 195$

40 (Dealer) — A

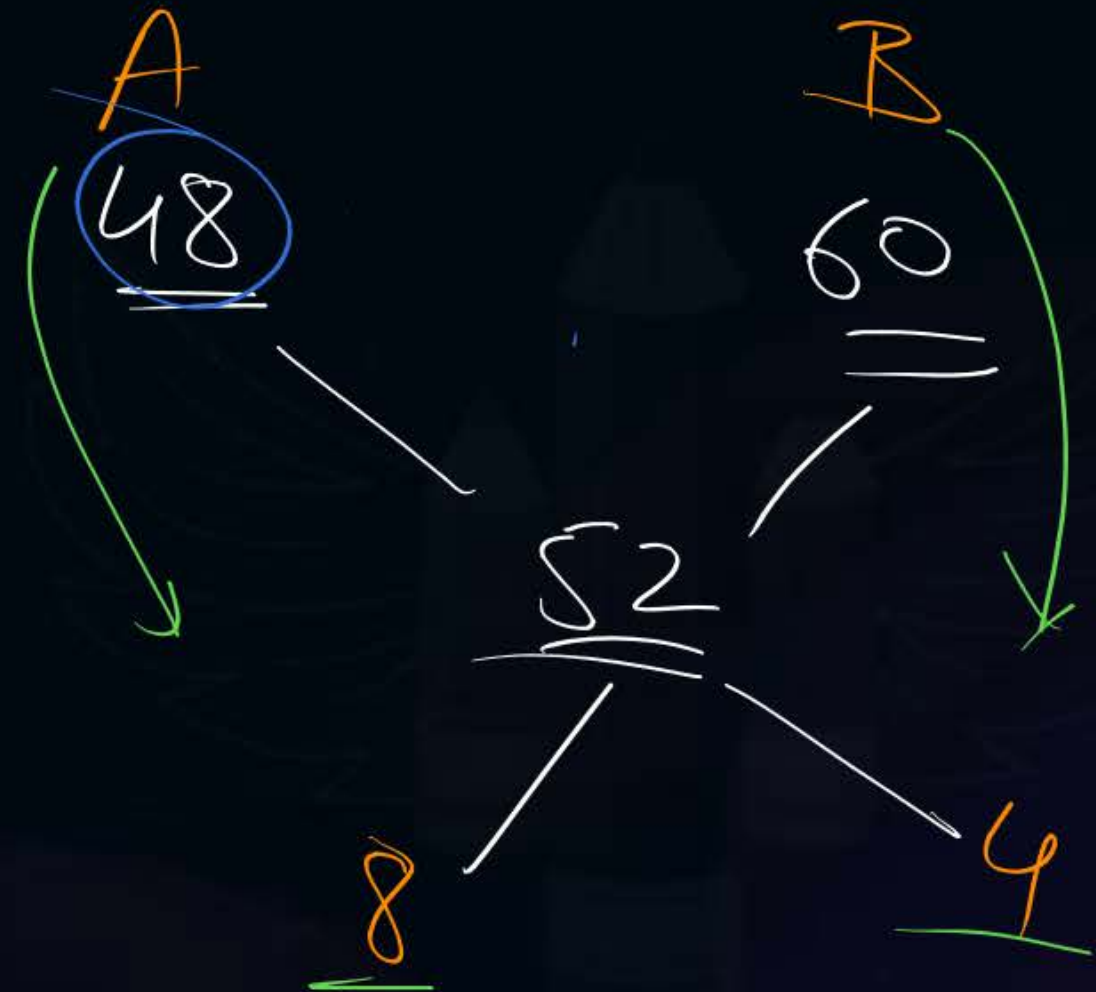$\dfrac{1}{5}$ (Cheaper) — C

Mean

$\dfrac{4}{5}$ (M−C)

39 (D−M)

#Q. A trader purchases two varieties of rice 'A' & 'B' at the rate of ₹48/kg and ₹60/kg respectively. In what ratio he should mix the two varieties, so that the mixture cost becomes ₹52/kg?

$$A:B = 8:4$$

$$2:1$$

[MCQ]

#Q. A trader purchases two varieties of Sugar 'P' & 'Q' at the rate of ₹42/kg and ₹80/kg respectively. In what ratio he should mix the two varieties, so that he can sell the mixture at ₹78/kg by getting 30% profit?

$$S.P = 78$$

$$P\% = 30\%$$

$$\frac{78}{C.P} = 1.3$$

$$\frac{78}{1.3} = C.P$$

$$P:Q = 20:18$$

$$= 10:9$$

P
42

Q
80

60

20   18

$$\frac{78-60}{1.3}$$

#Q. In a class with 360 students, the average age of all the boys is 24 years whereas average age of all the girls is 18 years. If average age of whole class is 20 years, then find the number of girls in that class.

$$24B + 18G = 20B$$
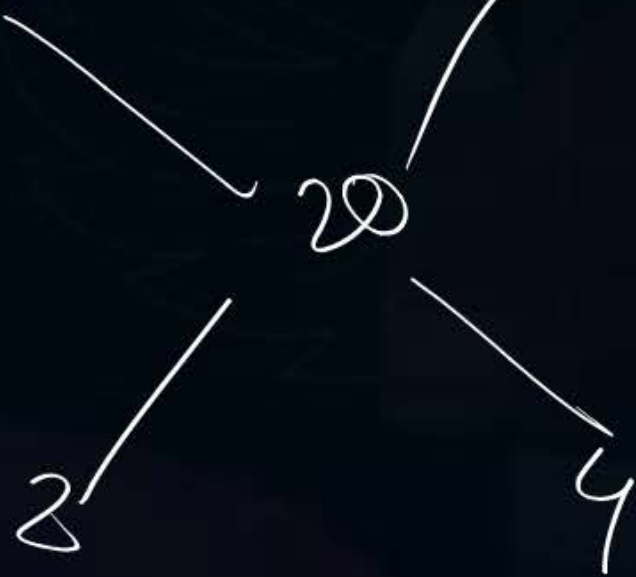$$+20G$$

A 300

B 40

C 120

D 240

$$B:G = 2:4$$
$$= 1:2$$

$$B \quad 24$$

$$G \quad \Rightarrow 4B = 2G$$

$$18 \Rightarrow \frac{B}{G} = \frac{2}{4} = \frac{1}{2}$$

$$G = \frac{2}{3} \times 360 = 240$$

$$20$$

$$2 \qquad 4$$

#Q. A merchant sells 1600 horses at an overall profit of 25%. Some of them he sold at 20% profit whereas remaining at 40% profit. Find the number of horses he sold at 40% profit.

$\frac{1}{4} \times 1600$ = 400

A. 400

B. 1200

C. 1240

D. 300

$20\%.P : 40\%.P$

$= 15 : 5$

$3 : 1$

20% ⟍ 40%

25%

15   5

[MCQ]

#Q. In a mixture of 40 litres, the ratio of milk and water is 4:1. How much water must be added to this mixture so that the ratio of milk and water becomes 2:3?

$$Mix \Rightarrow 40 \text{ lit}$$

$$40 : 40$$

$$Milk = 32 \text{ lit} \quad | \quad Water = 8 \text{ lit}$$

A 20 litres

B 30 litres

C 32 litres

D 40 litres

$$\frac{32}{40+x} = \frac{2}{5}$$

$$\frac{32}{8+x} = \frac{2}{3}$$

$$\frac{8+x}{40+x} = \frac{3}{5}$$

$$\left(\frac{\frac{1}{5}}{\frac{2}{5}} \quad \frac{1}{\frac{3}{5}} \quad \frac{2}{5} \right)$$

Mix   Water

$\boxed{Iron}$

(P)(W)

#Q. An alloy A consist of iron & copper in the ratio 5 : 7, whereas alloy B consist iron & copper in the ratio 3 : 1. In what ratio these two alloys are to be mixed to form a new alloy with iron & copper in the ratio 2 : 1?

$$A : B = \frac{1}{12} : \frac{3}{12}$$

A 5:13

B 7:5

C 1:3

D 3:1

$$= 1 : 3$$

A
$$\frac{5}{12}$$

B
$$\frac{3}{4} = \frac{9}{12}$$

$$\frac{2}{3} = \frac{8}{12}$$

$$\frac{1}{12}$$

$$\frac{3}{12}$$

#Q.   How many litres of water must be added to 16 litres milk containing 10% water to dilute it with 20% water?

A   3 litres

B   2 litres

C   1 litre

D   4 litres

Mix : water

$= 80 : 10$

$= (8 : 1)^{\times 2}$

$= 16 : 2$

Mix

10%

Water

100%

20%

80

10

Assignment

#Q. A mixture contains milk and water in the ratio 5:1. On adding 5 liters of water, the ratio of milk to water becomes 5:2. the quantity of milk in the mixture earlier was:

A   16 litres

B   25 litres

C   32.5 litres

D   22.75 litres

#Q. In what ratio must a grocer mix two varieties of pulses costing ₹15 and ₹20 per kg respectively so as to get a mixture worth ₹16.50 per kg?

A. 3:8

B. 5:3

C. 7:3

D. 4:5

#Q.   In what ratio must Ankit mix two varieties of sugar worth ₹20 per kg and ₹32 per kg so that by selling the mixture at ₹36 per kg he may gain 20%?

A   1:5

B   3:5

C   2:3

D   3:2

Basics of Number System

$1, 2, 3, \text{---} \infty$

$$\text{Natural Number}$$

$7 \,) \, 0 \, (\, 0^{\text{✓}} \, \infty^{\text{✓}}$

0

$0 \,) \, 5 \, ($

$\dfrac{0}{7} \Rightarrow 0^{\text{✓}}$

$\dfrac{15}{3} \Rightarrow 5^{\text{✓}}$

$3 \,) \, 15 \, (\, 5$

15

Whole No.

$0, 1, 2, 3 \text{---} \infty$

$\boxed{\dfrac{5}{0}} \Rightarrow \infty$

$\dfrac{16}{2} \Rightarrow 8 \quad 2 \,) \, 16 \, (\, 8$

16

Integer $\boxed{42.4}$ → $\boxed{\dfrac{382}{9}}$ Even

Rational

$\dfrac{3}{1}$

$4.8 \Rightarrow \dfrac{48}{10}$

$\Large 2) \dfrac{3}{\underset{1}{\cancel{2}}}$ ①

Prime No.

$1 \Rightarrow$ ①

Odd no

even no.

$-8 \Rightarrow \dfrac{-8}{1}$

$0 \Rightarrow \dfrac{0}{1}$

$$\boxed{4.\overline{9}}$$

$$10x = \boxed{424.4444\ldots \ldots}$$

$$-\quad x = \boxed{42.4444\ldots \ldots}$$

$$9x = 382$$

$$\therefore \underline{x} = \frac{382}{9}$$

Non-Prime Factors

OR

Composite

Multiply

6 → 1, 2, 3, 6

6 ⇒ 6, 12, 18, 24, 30, 36, 42, 48, 54

60, 66, 72, 78, 84, 90, 96, 102, 108
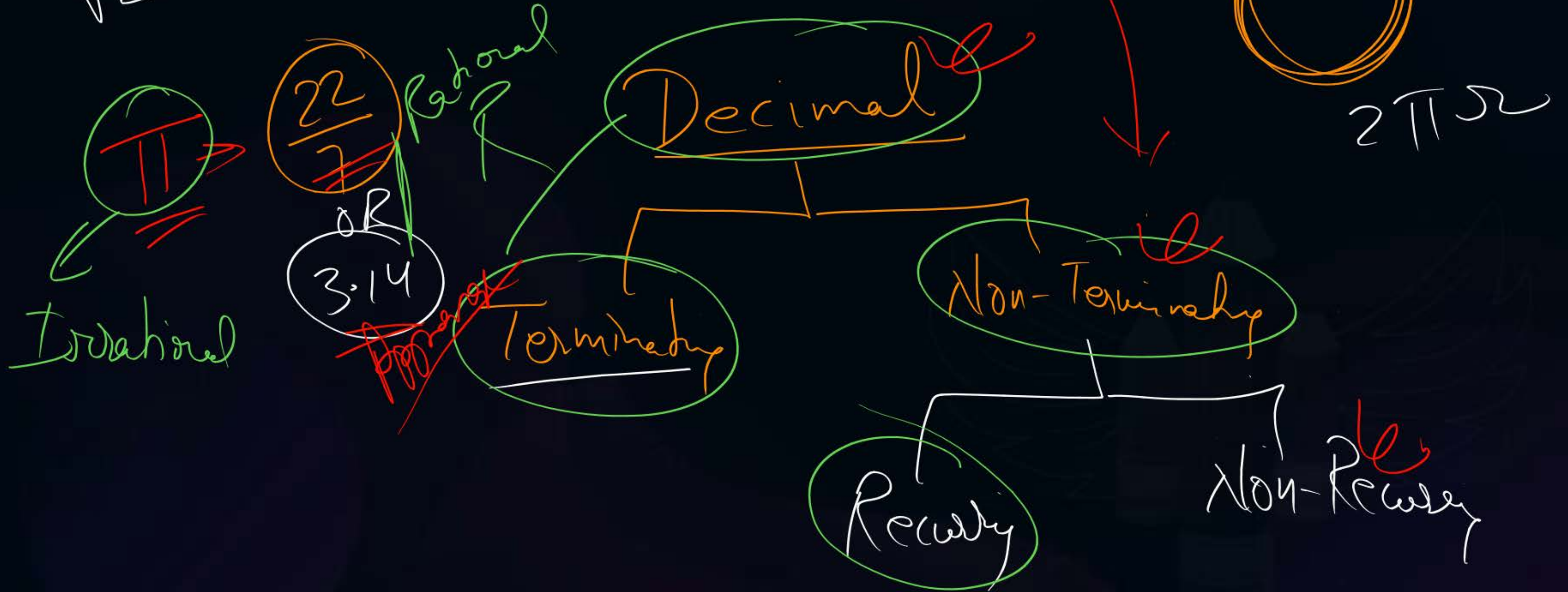
$$\frac{22}{7} = 3.\overline{142857}$$

$$7)\overline{22}(3.\overline{142857}$$
$$21$$

$$\frac{10}{7}$$

$$30$$
$$28$$

$$20$$
$$14$$

$$60$$
$$56$$

$$40$$
$$35$$

$$50$$
$$49$$

$$10$$

#Q.   Find the answer of given expression: 1 - 2 + 3 - 4 + 5..........2025.

2024

-1 -1 -1

$$2025$$

$$-1012$$

$$\overline{1013}$$

Assignment

#Q. What would the unit digit in the answer of given expression:

1! + 2! + 3! +....................2025!

Topic

Number System

THANK - YOU