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Question #02

2(A)

Ratio of two numbers = 3:5

Let two numbers be x and y

$$\frac{x}{y} = \frac{3}{5} \quad \longrightarrow (1)$$

According to question

$$\frac{x-9}{y-9} = \frac{12}{23} \quad \longrightarrow (2)$$

Required

Smallest number (small) = ?

From Eq (1) and (2)

$$5x = 3y$$

$$5x - 3y = 0 \quad \longrightarrow (4)$$

$$23x - 23\times 9 = 12y - 108$$

$$23x - 12y = -108 + 207$$

$$23x - 12y = 99 \quad \longrightarrow (5)$$

Multiplying Eq (4) by 4 and then subtracting from eq (5)

$$23x - 12y = 99$$

$$-20x + 12y = 0$$

$$3x = 99$$

$$\boxed{x = 33}$$

Put in Eq (4)

$$5(33) - 3y = 0$$

$$-3y = +(33)\times 5$$

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$$y = \frac{33 \times 5}{3}$$

$$\boxed{y = 55}$$

Hence smaller number = 33

2(B)

Ratio of Profit sharing = 5 : 7 : 8

months

Let, three partners = A : B : C

Let

investment of A for 14 months = $14x$

" " B for 8 months = $8y$

" " C " 7 " = $7z$

Then ratio of invistment for respective

$$14x : 8y : 7z = 5 : 7 : 8$$

$$\frac{14x}{8y} = \frac{5}{7}$$

$$98x = 40y$$

$$y = \frac{98}{40}x \longrightarrow (1)$$

Similarly

$$\frac{8y}{7z} = \frac{7}{8}$$

$$64y = 49z$$

using value of y

$$64\left(\frac{98}{40}x\right) = 49z$$

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$\frac{8 \times 98}{49} x = z$

$16x = z$

Now,

$x : y : z = x : \frac{98}{49} x : 16x$

$= : 20x : 49x : 320x$

÷ by all by x

$20 : 49 : 320$

(2c)

Average weight of A, B and C = 45kg

If Average of A and B = 40kg

and B and C = 43kg

B = ?

Given,

$45 = \frac{A+B+C}{3}$

$A+B+C = 135 \longrightarrow (1)$

Now,

$\frac{A+B}{2} = 40$

$A+B = 80 \longrightarrow (2)$

$\frac{B+C}{2} = 43$

$B+C = 86 \longrightarrow (3)$

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Using Eq (2) in (1)

$$80 + C = 135$$

$$C = 135 - 80$$

$$C = 55$$

Put in Eq (3)

$$B + 55 = 86$$

$$B = 86 - 55$$

$$B = 31$$

Hence weight of B = 31kg

2(D)

Let, number = x

According to question

$$x + 17 = 60 \times \frac{1}{x}$$

$$x^2 + 17x = 60$$

$$x^2 + 17x - 60 = 0$$

$$x^2 + 20x - 3x - 60 = 0$$

$$x(x+20) - 3(x+20) = 0$$

$$(x-3)(x+20) = 0$$

Either, or

$$x - 3 = 0 \qquad x + 20 = 0$$

$$x = 3 \qquad x = -20$$

Since number is positive in statement, so

$$\boxed{x = 3}$$

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Question #03

3(A)

%age profit earned by selling an article for Rs 1920 = %age loss incurred by selling article for Rs 1280

%age profit at 1920 = %age loss at 1280

$$\frac{\text{Profit}}{\text{CP}} \times 100 = \frac{\text{Loss}}{\text{CP}} \times 100$$

$$\text{Profit} = \text{Loss}$$

$$S.P - C.P = C.P - S.P$$

$$1920 - C.P = C.P - 1280$$

$$3200 = 2(C.P)$$

$$1600 = C.P$$

Now,

$$S.P = 25\% \text{ of } C.P + C.P$$

$$= \frac{25}{100} \times 1600 + 1600$$

$$= 400 + 1600 = 2000$$

S.P = Rs 2000

3(B)

A can do work = 15 days

B " " " = 20 days

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Total work:

5	15, 20
3	3, 4
4	1, 4
	1, 1

$= 60$

1 day of A's work $= \frac{60}{15} = 4$

1 day of B's work $= \frac{60}{20} = 3$

Together work $= 4 + 3 = 7$ day

4 days $= 28$

work left $= 60 - 28$

$= 32$

fraction $= \frac{32}{60} = \frac{8}{15}$

3(d)

$$\%\text{age error} = \frac{5/3 - 3/5}{5/3} \times 100$$

$$= \frac{\frac{25-9}{15}}{5/3} \times 100$$

$$= \frac{16}{25} \times 100 = 64\ \%$$

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3(c)

Let, age of mother = x

and age of person = y

$$y = \frac{2}{5}x \longrightarrow (1)$$

After 8 years

$$y+8 = \frac{1}{2}(x+8) \longrightarrow (2)$$

from Eq (1)

$$5y = 2x$$

$$2x - 5y = 0 \longrightarrow (3)$$

$$2y + 16 = x + 8$$

$$x - 2y = 8$$ xy by "2"

$$2x - 4y = 16 \longrightarrow (4)$$

Subtracting (4) by (3)

$$2x - 5y = 0$$

$$2x - 4y = 16$$

$$-y = -16$$

$$y = 16$$

Put in (3)

$$2x - 5(16) = 0$$

$$2x = 80$$

$$\boxed{x = 40}$$