PIPES & CISTERNS

1. A B C

4 6 8

(+) (+) (−)

LCM = 24

6 4 3

6+4−3 = 7 u/hr

No of hrs = $\frac{24}{7}$

$= 3\frac{3}{7}$ hrs

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(2) (+) A = 32 min ⇒ 45

(+) B = 36 min ⇒ 40

(−) C = 20 min ⇒ 72

LCM = 1440

45+40−72 = 13 u/min.

Time taken to fill half = $\frac{720}{1440} \times \frac{1}{13}$

$= \frac{720}{13}$ min.

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(3) A+B = 6 hrs.

(4) $A+B+C = 6 \times (7)$ 42 units

$A+B = 7$ (6)

$(A+B+C)$ work for 2 hrs $= 2 \times 7 = 14$ units

Remaining $42 - 14 = 28$ units

Time taken by 'C' $= \frac{28}{1} = 28$ hrs.

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(5) $A = 36$ (+)

$B = 45$ (+)

$= \frac{36 \times 45}{81} = 20$ min

$= \frac{\text{Product}}{\text{Sum}}$

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(6) (+) $A = 12 \Rightarrow 5$ LCM $(12, 15) = 60$

due to Leak $= 15 \Rightarrow 4$.

$5 - x = 4$

$5 - 4 = x$

$x = 1$

time $= \frac{60}{1}$

Tank can be emptied in 60hrs

(7) (+) A = 10 hrs = 9 LCM = 90

(+) B = 15 hrs = 6

(-) C = 18 hrs ⇒ 5

$(9+6-5) = 10$

$\text{time} = \frac{90}{10} = 9 \text{ hrs}$

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(8) Leak = 6 hrs x (8) cistern = 10 lit/hr

Emptied = 16 hrs x (3) LCM = (48)

Filling tap take 5 hrs

Capacity = 5 x 48 x 10 = 2400.

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(9) A = 20 hrs = 15 LCM = 300

B = 25 hrs = 12

C = 30 hrs = 10

A B C

15 + 12 + 10

(37)

ITP

No of hours = $\frac{300}{37} \times 3$

$= \frac{900}{17}$ hrs.

(10) A = 20 min.

(11) (→) A = 8 hrs (3) fillings 6 lit/min.

empties = 12 hrs (2)

$3 - x = 2$

$x = 1$

24
36 2
144
72
864

Capacity = $1 \times 24 \times 60 \times 6 = 8640$ L.

(12) + P = 10 = 9 LCM = 90

+ Q = 15 = 6

− R = 18 = 5 (9+6) − 5

= 15 − 5 = 10

Time = $\frac{90}{10} = 9$ hr.

(13) A ⇒ 20 min = 5 LCM = 100

B ⇒ 25 min = 4

5 (5+4) = 45

Remaing = 55 ⇒ 55/5 = 11 min.

(14) (+) A = 8 hrs = 5 LCM of (8, 10) = 40

Leak:

Leak = 10 hrs = 4

$x = 5 - 4$

$= 1$.

Time = $\frac{40}{1}$ = 40 hrs.

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(15) $x = 24$ min $\Rightarrow 4$ LCM = 96

$y = 32$ min $\Rightarrow 3$

'x' should worked continously = $18 \times 4 = 72$

Remaining = $96 - 72 \Rightarrow 24$

'y' taken time = $\frac{24}{3} = 8$ min

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(16) (+) P = 6 hrs $\Rightarrow 4$ Hlit/min. LCM = 24

(−) P = 8 hrs $\Rightarrow 3$

$4 + x = 3$

$\boxed{x = 1}$

Capacity = $1 \times 24 \times 60 \times 4 = 5760$ L

(17) (+) P = 15 ⇒ 2 LCM = 30

(+) Q = 10m ⇒ 3

(-) R = 5min ⇒ 6.

4 X 5 = 20

when 'R' also joined. tank is emptied by '1' U/min.

There are 20 units.

so, time = 20 min.

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(18) (+) A = 5 = 6 LCM = 30.

(+) B = 6 = 5

(-) C = 2 = 15

A & B ⇒ 6 + 6 + 5 = 17 units

A & B & C ⇒ 6 + 6 + 5 - 15 = -4 (empties)

Time = $\frac{17}{4}$ = $4\frac{1}{4}$ = 4hrs : 15 min.

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(19) P = 24 ⇒ 4 LCM = 96.

Q = 32 ⇒ 3

second pipe is fixed for 16 min = 48

Remaining = 48

Time = $\frac{48}{4}$ = 12 min