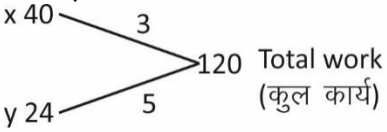
TIME & WORK-1_EXPLANATION

Answer 1: (A)
Person x can complete the whole work in = 8 × 5 = 40 days
Person y can complete the whole work in = 6 × 4 = 24 days



Now, 40% of total work = 120 × (2/5) = 48 units

Required days = $\frac{48}{3+5} = 6$ days

Answer 2: (B)
According to question,

18A = 30C

A : C = 30 : 18 = 15 : 9

Suppose the number of children that be accommodated with 12 adults are x.

Now, 18 × 15 = 12 × 15 + 9x

⇒ 270 = 180 + 9x

⇒ 9x = 90

⇒ x = 10

Answer 3: (A)
According to question,

P = 3Q ……(i)

P + Q = 44 ……(ii)

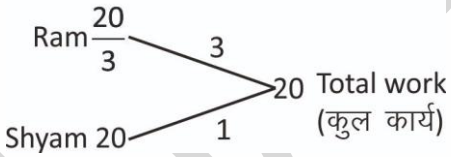
From (i) & (ii), we get:

Q = R …..(iii)

Hence, P : Q : R = 3 : 1 : 1

Answer 4: (C)
Ram and Shyam can complete the whole work in = $4 \times \frac{5}{3} = \frac{20}{3}$ days

Shyam can complete the whole work in = $8 \times \frac{5}{2} = 20$ days



Effciency of Ram = 3 – 1 = 2 units
Ram can complete the whole work in 20/2 = 10 days

Answer 5: (D)
W completes 25% work in 30 days, so 100% work is completed in 120 days.

X completes 1/4 work in 10 days, so X completes the whole work in 40 days.

Y does 40% of work in 40 days, so Y does 100% of work in 100 days.

Z does 1/3 work in 13 days, so Z completes 100% of work in 39 days.

Hence, Z completes the work first.

Answer 6: (B)
Required time = $\frac{ab}{a+b} = \frac{20 \times 30}{20+30}$ = 12 min

Answer 7: (D)
According to question,
1000 × 30 = 1000 × 10 + 2000x
⇒ 20000 = 2000x
⇒ x = 10

Answer 8: (B)
Here, a = 200, d = 50, n = 10
Penalty that has to be paid if he has delayed the work by 10 days will be calculated as follows.

$S_n = \frac{n}{2}[2a + (n - 1)\, d]$

$S_{10} = \frac{10}{2}[2 \times 200 + (10 - 1)\, 50]$

$= 5\,[400 + 450]$

$= 4250$

Answer 9: (B)

Volume of the tank = 20 × 15 × 6 = 1800 m³

Capacity of the tank = 1800 × 1000 litres

= 1800000 litres

Let the water in this tank last for d days.

Water consumed by all people in d days = Capacity of the tank

⇒ 4000 × 150 × d = 1800000

⇒ d = 3

Answer 10: (A)
Let required men be x.
According to formula,
$M_1D_1 = M_2D_2$
12M × 8 = 16W × 12 = (8M + 8W) × 6 + (x + 12) M × 1
M : W = 2: 1
According to question,
12 × 2 × 8 = (8× 2 + 8 × 1) × 6 + (x + 12) × 2 ×1
⇒ 192 = (16 + 8) × 6 + 2(x + 12)
⇒ 2(x + 12) = 192 – 144 = 48
⇒ 2x = 24
⇒ x = 12 men

Answer 11: (A)

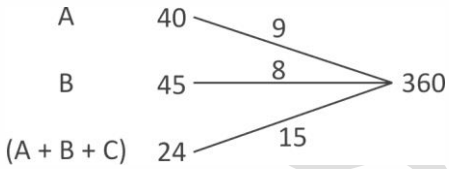
	A	:	B
Efficiency→	3	:	1
Time →	1	:	3

difference : 2

2 ≡ 90 days
1 ≡ 45 days
3 ≡ 135 days
Hence, A can complete the task in 45 days and B can complete the task in 135 days.

Answer 12: (C)
Let number of men in the beginning be x.
According to question,
$M_1D_1 = M_2D_2$
x × 10 = (x + 3) × 8
⇒ x = 12
Thus, there were 12 men in the beginning.

Answer 13: (D)

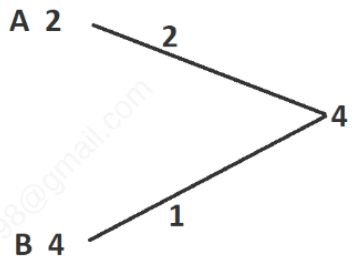


C's 1 min work = 15 – 9 – 8 = –2 units

C can empty the whole tank in = $\frac{360}{2}$ = 180 min

∴ Capacity of tank = 180 × 15 = 2700 ltr

Answer 14: (C)



Total work = 4 units
Efficiency of (A + B) = 2 + 1 = 3 units
According to question,
Total work done by A, B and C in 10 hours =

$2\left(\frac{3}{12}+\frac{3}{9}+\frac{3}{6}+\frac{3}{4}+\frac{3}{3}\right)$

$= 5\frac{2}{3}$ units

If total work is 4 units, then work done by pipe C in 10 hours = $5\frac{2}{3} - 4 = \frac{5}{3}$ units

Now, $\frac{5}{3}$ units ≡ 10 hours

1 unit ≡ $10 \times \frac{3}{5}$ hours

4 units ≡ $10 \times \frac{3}{5} \times 4$ = 24 hours

Answer 15: (D)

Ratio of number of men, women and children = 6 : 5 : 2

The total number of men, women and children are = 39

Therefore, the number of men = $\frac{6\times39}{13}=18$

The number of women = 15

The number of children = 6

Ratio of work done by men : women : children = 6 : 3 : 1

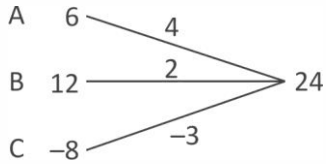
∴ Ratio of work done by 18 men, 15 women and 6 children

= (18 × 6) : (15 × 3) : (6 × 1) = 108 : 45 : 6

Hence, Rs. 1113 would be divided in this ratio.

Daily wages of a child = $\frac{6\times1113}{108+45+6}=\frac{6\times1113}{159}=42$

Answer 16: (A)



Total work = 24 unit

(A + B + C)'s one minute's work = 4 + 2 – 3 = 3 unit

(A + B + C)'s 4 minutes work = 4 × 3 = 12 unit

Remaining work = 24 – 12 = 12 unit

A and B together fill the remaining tank in = $\frac{12}{6}$

= 2 min.

Hence, total time = 4 + 2 = 6 min

Answer 17: (A)

Pipe 1	:	Pipe 2
Diameter → P	:	4P
Efficiency → $(P)^2$	:	$(4P)^2$
1	:	16

Total work = 1 × 120 = 120 unit

∴ Required time = $\frac{120}{16}=7\frac{1}{2}$ min

Answer 18: (B)

Here, the cistern be filled by pipe A in x hours. Then, pipe B will fill it in (x + 12) hours.

According to the question,

$x^2 – 4x – 96 = 0$

$\Rightarrow x^2 – 12x + 8x – 96 = 0$

$\Rightarrow x \neq -8, x = 12$

$\Rightarrow x = 12$

Hence, A can alone fill the cistern in 12 hours.

Answer 19: (C)

At the end of 3 minutes, the tank will have = 40 + 30 – 20 = 50 ltr

After 13 such cycles, the tank will have = 13 × 50 = 650 ltr

In 13 cycles, it will take 13 × 3 = 39 minutes

At the end of 39^{th} minute, pipe C will be closed & pipe A will be opened & add 40 ltr to the tank.

Remaining part = 700 – (650 + 40) = 10 ltr

Time taken to fill the remaining part = 10/30 = 1/3 min

∴ Total Time taken = $40 + \frac{1}{3} = 40\frac{1}{3}$ min

Answer 20: (A)

A can complete $\frac{1}{3}$ rd of work in = 10 days

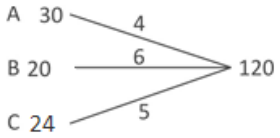
A can complete whole work in = 10 × 3 = 30 days

B can complete $\frac{3}{5}$ th of work in = 12 days

B can complete whole work in = 20 days

C can complete $\frac{2}{3}$ rd work in = 16 days

C can complete whole work in 24 days



Total work = 120 units

(A + B + C)'s one day's work = (4 + 6 + 5) = 15 units

Required number of days = $\frac{120}{15}=8$