

Advanced Educational Activities Pvt. Ltd.

Solutions for QAHO1162504

Solutions for question 1 to 20:

1. Work done per day by A = $\frac{1}{24}$
Work done per day by B = $\frac{1}{12}$
Work done per day by A and B together
$$= \frac{1}{24} + \frac{1}{12} = \frac{3}{24} = \frac{1}{8}$$

∴ The number of days in which A and B can together complete the work is 8. Choice (3)

2. B's one day work
= (A + B)'s one day work - A's one day work.
B's one day work = $\frac{1}{14} - \frac{1}{21} = \frac{3-2}{42} = \frac{1}{42}$
B can complete the work in 42 days.

Choice (5)

3. Given, (A + B)'s one day's work = $\frac{1}{36}$ ---- (1)

(B + C)'s one day's work = $\frac{1}{45}$ ---- (2)

and (C + A)'s one day's work = $\frac{1}{60}$ ---- (3)

Adding (1), (2) and (3), we get,
two days' work of A, B and C

$$= \frac{1}{36} + \frac{1}{45} + \frac{1}{60}$$

$$= \frac{5+4+3}{180} = \frac{12}{180} = \frac{1}{15} \text{ th of the total work.}$$

One day's work of A, B and C = $\frac{1}{30}$ th of the total work.

A's one day's work = $\frac{1}{30} - \frac{1}{45} = \frac{3-2}{90} = \frac{1}{90}$ th of the total work.

B's one day's work = $\frac{1}{30} - \frac{1}{60} = \frac{1}{60}$ th of the total work.

C's one day's work = $\frac{1}{30} - \frac{1}{36} = \frac{1}{180}$ th of the total work.

A, B and C can complete the work in 90 days, 60 days and 180 days respectively. Choice (2)

4. (a) Let the work be completed in x days.

$$\frac{x}{25} + \frac{x-7}{20} = 1$$

$$\Rightarrow \frac{4x+5(x-7)}{100} = 1$$

$$\Rightarrow 4x + 5x - 35 = 100 \Rightarrow x = 15$$

The total work is completed in 15 days.

Choice (4)

- (b) Let the total work be completed in x days.

$$\frac{x}{28} + \frac{4}{16} = 1$$

$$\frac{x}{28} = \frac{3}{4} \Rightarrow x = 21.$$

Choice (3)

5. A and B work on alternate days beginning with A. So A works on the 1st, 3rd, 5th days and B works on 2nd, 4th, 6th days.

Part of work done in the every 2 days

$$= \frac{1}{12} + \frac{1}{24} = \frac{2+1}{24} = \frac{1}{8}$$

The total time taken to complete the work is 2×8 i.e., 16 days. Choice (1)

6. In a period of 2 days, work done

$$= \frac{1}{10} + \frac{1}{5} = \frac{3}{10}$$

In 3 such time periods of 2 days i.e. 6 days (As in the fraction $\frac{3}{10}$, 3 goes 3 times in 10),

$$\text{the part of the work completed} = \frac{3}{10} \times 3 = \frac{9}{10}$$

$$\text{Part of remaining work} = 1 - \frac{9}{10} = \frac{1}{10}$$

$\frac{1}{10}$ of the work can be done by A in 1 day or it can be done by B in $\frac{1}{2}$ day. The least time taken to complete the work is $6\frac{1}{2}$ days. Choice (5)

7. P's work per day = $\frac{1}{12}$

Q's work per day = $\frac{1}{16}$

Work done per day by P, Q and R together = $\frac{1}{6}$

R's work per day = $\frac{1}{6} - \left(\frac{1}{12} + \frac{1}{16} \right) = \frac{1}{48}$

The ratio of one day's work of P, Q, R = $\frac{1}{12} : \frac{1}{16} : \frac{1}{48}$

$$= 4 : 3 : 1$$

P's share = $\frac{4}{8} \times 16800 = ₹8,400$

Q's share $\left(\frac{3}{8} \text{ of the total} \right) = \frac{3}{8} \times ₹16800 = ₹6300$

∴ R's should receive remaining ₹2100.

Choice (1)

8. B's one day's work = $\frac{1}{26}$ th of total work.

As A is 30% more efficient than B, he can do 30% more work than B in the same time.

A's one day's work = $\frac{1}{26} \times \frac{130}{100} = \frac{1}{20}$ th of the total work.

A can complete the work in 20 days. Choice (1)

9. Let us say, A can complete the work in x days. Then, B can complete the work in 2x days.

- So, one day's work of A and B = $\frac{1}{x} + \frac{1}{2x} = \frac{3}{2x}$ th of the total work.
 So $\frac{3}{2x} = \frac{1}{21} \Rightarrow 2x = 63$. Choice (2)
10. The work done per day by Naveen alone, Pavan alone and both working together is $\frac{1}{n+9}$, $\frac{1}{n+16}$ and $\frac{1}{n}$ respectively. The combined rate of them working together is the sum of their individual rates. Hence, $\frac{1}{n} = \frac{1}{n+9} + \frac{1}{n+16}$
 $\Rightarrow (n+9)(n+16) = n(n+16) + n(n+9)$
 i.e. $n^2 + 9n + 16n + 9 \times 16 = n^2 + 16n + n^2 + 9n$
 $\Rightarrow n^2 = 9 \times 16 \Rightarrow n = 3 \times 4 = 12$ Choice (2)
11. Using $\frac{M_1 D_1 H_1}{W_1} = \frac{M_2 D_2 H_2}{W_2}$, we get
 $\frac{60 \times 15 \times 8}{800} = \frac{45 \times D_2 \times 6}{300}$
 $\Rightarrow D_2 = 10$ Choice (2)
12. (a) The time taken by the outlet pipe to empty the tank is less than the time taken by the inlet pipe to fill the tank. \therefore if the inlet pipe and the outlet pipe are opened simultaneously when the tank is partially or totally full, the tank will get emptied. As both pipes are opened simultaneously when the tank is half full the pipes have to empty the half tank.
 So the part of tank emptied by both the pipes working together in one minute
 $= \frac{1}{8} - \frac{1}{12} = \frac{1}{24}$
 The time taken to empty half the tank = $\frac{1/2}{1/24}$
 $= \frac{1}{2} \times \frac{24}{1} = 12 \text{ min.}$ Choice (3)
- (b) The part of the tank emptied by the leak in one minute
 $= \frac{1}{12} - \frac{1}{20} = \frac{5-3}{60} = \frac{1}{30}$
 The time taken to empty the tank = 30 min. Choice (3)
13. Let the leak empty the full tank in x hours.
 $\frac{1}{8} - \frac{1}{x} = \frac{1}{12}$
 $\Rightarrow \frac{1}{x} = \frac{1}{8} - \frac{1}{12} = \frac{1}{24}$
 $\Rightarrow x = 24$
 Required answer = $24/2 = 12$ Choice (5)
14. Let the work be completed in x days.
 $\frac{x-4}{25} + \frac{x}{40} + \frac{x-2}{48} = 1$
 $\frac{48(x-4) + 30x + 25(x-2)}{1200} = 1$
 $48x - 192 + 30x + 25x - 50 = 1200$
 $103x = 1200 + 192 + 50$
 $103x = 1442$
 $x = 14$
 The work was completed in 14 days. Choice (1)
15. 10(6 men's work + 9 women's work)
 $= 15(5 \text{ men's work} + 4 \text{ women's work})$
 $60 \text{ men's work} + 90 \text{ women's work}$
 $= 75 \text{ men's work} + 60 \text{ women's work}$
 $\Rightarrow 1 \text{ man's work} = 2 \text{ women's work}$
 $\Rightarrow 6 \text{ men's work} + 9 \text{ women's work} = 21 \text{ women's work}$
 $\therefore 4 \text{ men's work} + 7 \text{ women's work} = 15 \text{ women's work}$
 $6 \text{ men's work} + 9 \text{ women's work} = 21 \text{ women's work}$ which can be done in 10 days.
 So, 15 women can do the work in $\frac{21 \times 10}{15} = 14 \text{ days}$ Choice (1)
16. Let P takes x hours to fill the empty tank, then Q takes (x + 9) hours.
 Given,
 $\frac{1}{x} + \frac{1}{x+9} = \frac{1}{6}$
 $\Rightarrow x^2 - 3x - 54 = 0$
 $\Rightarrow (x-9)(x+6) = 0$,
 $\Rightarrow x = 9$,
 Hence in 2 hours, P and Q fill
 $\frac{2}{9} + \frac{2}{18}$ i.e., $\frac{1}{3}$ rd of the tank.
 i.e., still $2/3$ rd is empty. Choice (4)
17. Using man-days concept, the Work requires 42×15 i.e., 630 man days.
 Work completed in first 10 days,
 $42 \times 5 + 30 \times 5$ i.e., 360 man days.
 Hence the remaining work 270 man days.
 Required time = $\frac{270}{12}$ i.e., $22 \frac{1}{2}$ days. Choice (4)
18. Let the work done per day for a man and a woman be m and w respectively.
 Given, Total work = $10 \times 12m = 10 \times 15w$
 $\Rightarrow m : w = 5 : 4$
 $(M \times m + 4M \times w) \times 3 = 84\% \text{ of the total work}$
 $\Rightarrow M \times (3m + 12w) = 84\% \text{ of } 120m$
 $\Rightarrow M \times (3m + 9.6m) = 84\% \text{ of } 120m$
 $\Rightarrow M = \frac{84\% \text{ of } 120m}{12.6m} = 8$ Choice (3)
19. If two pipes take 30 minutes to fill the tank, one pipe takes 60 minutes to fill the tank. When A and C are opened simultaneously the part of the tank filled in one minute
 $= \frac{1}{60} - \frac{1}{80} = \frac{1}{240}$
 Therefore,
 when both are opened it takes 240 minutes or 4 hours. Choice (1)
20. Part of the tank emptied by P and Q in 3 hours
 $= 4 \times \left(\frac{1}{15} + \frac{1}{20} \right) = 7/15$
 Part of the tank filled = $\frac{4}{5} - \frac{7}{15} = \frac{1}{3}$
 Hence part of the tank to be filled = $\frac{2}{3}$
 Work done by P, Q and R in 1 hour
 $= \frac{1}{4} - \frac{1}{15} - \frac{1}{20} = \frac{15-4-3}{60} = \frac{2}{15}$
 \therefore Required time = $\frac{2/3}{2/15} = 5 \text{ hours.}$ Choice (5)

(2)10. The work done per day by Naveen alone, Pavan alone and both working together is $1n+9$, $1n+16$ and $1n$ respectively. The combined rate of them working together is the sum of their individual rates. Hence, $1n=1n+9+1n+16 \Rightarrow (n+9)(n+16)=n(n+16)+n(n+9)$ i.e. $n^2+9n+16n+9 \times 16 = n^2+16n+n^2+9n \Rightarrow n^2=9 \times 16 \Rightarrow n=3 \times 4=12$ Choice (2)11. Using 222211111 WHDMWHDM=, we get 3006D45800815602 $\square\square\square\square\square\square$ D2= 10 Choice (2)12. (a) The time taken by the outlet pipe to empty the tank is less than the time taken by the inlet pipe to fill the tank. \square if the inlet pipe and the outlet pipe are opened simultaneously when the tank is partially or totally full, the tank will get emptied. As both pipes are opened simultaneously when the tank is half full the pipes have to empty the half tank. So the part of tank emptied by both the pipes working together in one minute = $24112181=-$ The time taken to empty half the tank = $24/12/1=$ min 12 12421= \square . Choice (3) (b) The part of the tank emptied by the leak in one minute = $6035201121=-=-=$ 30 1 The time taken to empty the tank = 30 min. Choice (3)13. Let the leak empty the full tank in x hours. $18-1x=112 \Rightarrow 1x=18-112=124 \square x=24$ Required answer = $24/2=12$ Choice (5)14. Let the work be completed in x days. $1482x40x254x=-++-()$ 112002x25x304x48=-++-48x -192 + 30x + 25x -50 = 1200 103x = 1200 + 192 + 50 103x = 1442x = 14 The work was completed in 14 days. Choice (1)15. $10(6 \text{ men's work} + 9 \text{ women's work}) = 15(5 \text{ men's work} + 4 \text{ women's work})$ 60 men's work + 90 women's work = 75 men's work + 60 women's work \square 1 man's work = 2 women's work \square 6 men's work + 9 women's work = 21 women's work \square 4 men's work + 7 women's work = 15 women's work 6 men's work + 9 women's work = 21 women's work which can be done in 10 days. So, 15 women can do the work in days 14 15 10 21= \square Choice (1)16. Let P takes x hours to fill the empty tank, then Q takes (x + 9) hours. Given, $619x1x1=++\square x^2-3x-54=0 \square (x-9)(x+6)=0, \square x=9$, Hence in 2 hours, P and Q fill 18 292+i.e., 31% of the tank. i.e., still 2/3rd is empty. Choice (4)17. Using man-days concept, the Work requires 42 \square 15 i.e., 630 man days. Work completed in first 10 days, 42 \square 5 + 30 \square 5 i.e., 360 man days. Hence the remaining work 270 man days. Required time = 12270 i.e., 2221 days. Choice (4)18. Let the work done per day for a man and a woman be m and w respectively. Given, Total work = $10 \times 12m = 10 \times 15w \Rightarrow m:w = 5:4$ ($M \times m + 4M \times w$) $\times 3 = 84\%$ of the total work $\Rightarrow M \times (3m + 12w) = 84\%$ of 120m $\Rightarrow M \times (3m + 9.6m) = 84\%$ of 120m $\Rightarrow M = 84\%$ of 120m 12.6m = 8 Choice (3)19. If two pipes take 30 minutes to fill the tank, one pipe takes 60 minutes to fill the tank. When A and C are opened simultaneously the part of the tank filled in one minute = $2401801601=-$ Therefore, when both are opened it takes 240 minutes or 4 hours. Choice (1)20. Part of the tank emptied by P and Q in 3 hours = $4 \square (115+120)=7/15$ Part of the tank filled = $45-7/15=13$ Hence part of the tank to be filled = 23 Work done by P, Q and R in 1 hour = $14-115-120=15-4-360=215 \square$ Required time = $23/215=5$ hours. Choice (5)