DAILY QUESTIONS

28TH MAY '18

QUANT- TIME AND WORK
Q.1) A typist can type 5 sheets in 7 minutes. Taking double the time than first typist, second typist types 1 more than 7 times the number of sheets typed by first typist in 1 minute. The third typist types at the rate of 10 sheets in 42 minutes. Find the average of their speeds per minutes.

Solution (b)

Speed of the first typist (per minute) = \( \frac{5}{7} \)

Speed of the second typist (per minute) = \( \frac{\left(\frac{5}{7} \times 7\right) + 1}{14} = \frac{6}{14} \)

Speed of the third typist (per minute) = \( \frac{10}{42} \)

So, average = \( \frac{\frac{5}{7} + \frac{6}{14} + \frac{10}{42}}{3} \)

= \( \frac{30 + 18 + 10}{126} \)

= \( \frac{58}{126} \)

= \( \frac{29}{63} \) (ans.)
Q.2) A can paint a wall in 11 days. How long would it take (approximately) for B and C to paint the same wall together if it is known that to paint a smaller wall, individually, A took 7 days, B took 10 days and C took 12 days?

[a] 9 days  
[b] 15 days  
[c] 60 days  
[d] cannot be determined

Solution (a)

Work done by B and C in 1 day = \( \frac{1}{10} + \frac{1}{12} = \frac{11}{60} \)

Also (for the same job) work done by A in 1 day = \( \frac{1}{7} \)

Ratio of the time taken by B and C together to that taken by A = 60 : 77

Time taken by B and C together to paint the larger wall = \( 11 \times \frac{60}{77} = 8.57 = 9 \text{ days (approx.)} \) (ans.)
Q.3) The ratio of the amount of work done by (X-1) labours in (X+1) days and (X+1) labours in (X+2) days is 5 : 6. Then the value of X is:

[a] 16  
[b] 15  
[c] 17  
[d] 14

Solution (a)

From $M_1 D_1 = M_2 d_2$

$\frac{M_1 D_1}{M_2 D_2} = \frac{5}{6}$

$(X-1) (X+2) / (X+1) (X+2) = \frac{5}{6}$

$(X-1) / (X+2) = \frac{5}{6}$

$6X - 6 = 5X + 10$

$X = 16$ (ans.)
Q.4) A can do as much work in 4 days as B can do in 5, and B can do as much work in 6 days as C in 7 days. In what time will C do a piece of work which A can do in a week?

[a] 10\frac{5}{24} days
[b] 4\frac{4}{5} days
[c] 6\frac{8}{15} days
[d] 12\frac{6}{19} days

Solution (a)
\[ A \times 4 = B \times 5 \] .......(1)

From \[ M1P1 = M2P2 \]
\[ \frac{A}{B} = \frac{5}{4} \]
\[ B \times 6 = C \times 7 \] .......(2)

\[ \frac{B}{C} = \frac{7}{6} \]
\[ \frac{A}{B} \quad \frac{B}{C} \]
\[ 5 \quad 4 \quad 7 \quad 6 \]

Per day efficiency of A = 5\times7 = 35
Per day efficiency of B = 4 \times 7 = 28
Per day efficiency of C = 4 \times 6 = 24

Total work of A = 35 \times 7
C done this work in = \frac{35 \times 7}{24} = \frac{245}{24} = 10\frac{5}{24} days
Q.5) A group of workers can complete a piece of work in 50 days, when they are working individually. On the first day one person works, on the second day another person joins him, on the third day one more person joins them and this process continues till the work is completed. How many approximate days are needed to complete the work?

[a] 8 days
[b] 9 days
[c] 10 days
[d] 11 days

Solution (c)

Let a man complete 1 piece of work in a day

Then total work = 50 unit

So, first day = 1 man x 1 work day = 1

Then second day = 2 men x 1 work day = 2

Third day = 3 men x 1 work day = 3

Let the whole work will be completed in N days

Then total work = 1+2+3+……N = 50

N(N+1) / 2 = 50

N(N+1) = 100

Then N = 10 days (approx.)
Q.6) A tank of dimensions 18m x 10m x 8m is filled to its capacity. A drain pipe can empty the tank in 50 hours. An inlet pipe supplies water at the rate of 6 ltr/sec. If both the pipes are opened at the same time, how much time would they take to empty the tank?

[a] 100 hrs  
[b] 150 hrs  
[c] 300 hrs  
[d] 200 hrs

Solution (d)

Dimensions of the tank is 18m x 10m x 8m
So the capacity of the tank is 18m x 10m x 8 m$^3$
= 1440 x 1000 litre

time taken by inlet pipe in 1 hr = 6 x 60 60
= 21600 litre

time taken to fill the tank
1440 x 1000/21600
= 200/3 hrs

time taken in draining the tank = 50 hrs which is less than 200/3 hrs

time taken to emptying the tank when both pipes are opened
= 1/50 - 3/200
= 1/200

It takes 200 hrs to empty the full tank.
Q.7) Pipes P and Q are inlet pipes while pipe R is an outlet pipe of a tank. Pipe P supplies water at 30 ltr/hr. Pipe Q can fill the tank in 6 hrs while pipe R can empty it in 24 hrs. The empty tank gets filled in 2 hrs when all the three pipes are opened simultaneously. What is the capacity of the tank?

[a] 40 ltr.
[b] 60 ltr
[c] 80 ltr.
[d] 90 ltr.

Solution (c)
The fraction of the tank filled by Q in 2 hrs. = \( \frac{2}{6} = \frac{1}{3} \)
The fraction of the tank emptied by R in 2 hrs. = \( \frac{2}{24} = \frac{1}{12} \)
The fraction of the tank is filled by Q and R together on 2 hrs = \( \frac{1}{3} - \frac{1}{12} = \frac{4}{12} = \frac{1}{3} \)

\( \frac{3}{4} \) of the tank is filled by P alone in 2 hrs.

The water supplied by P in 2 hrs. = \( 2 \times 30 = 60 \) ltr.

which is equal to \( \frac{3}{4} \)th of the tank

means the capacity of the tank = \( 60 \times \frac{4}{3} = 80 \) ltr. (ans.)
Q.8) X and Y drink milk daily. X can drink 4 ltrs of milk in 3 days while Y can drink 8 ltrs of milk in 7 days. In how many days can the two persons together consume 52 litres of milk, if each of them drinks the same quantity of milk on everyday?

[a] 35 days
[b] 39 days
[c] 42 days
[d] 21 days

Solution (d)

X can drink $\frac{4}{3}$ ltrs everyday
Y can drink $\frac{8}{7}$ ltrs everyday

$X + Y$ together can drink everyday $= \frac{4}{3} + \frac{8}{7}$

$= \frac{52}{21}$ ltrs

so it takes them 21 days to consume 52 ltrs of milk.
Q.9) A, B and C can complete a piece of work in 9, 12 and 18 days respectively. In how much time can A and C together complete a work, which B can complete in 48 days?

[a] 24 days
[b] 96 days
[c] 36 days
[d] 72 days

Solution (a)

Lcm of 9, 12 and 18 = 36

By dividing days from lcm we got per day work

Per day work of A = 4 unit
Per day work of B = 3 unit
Per day work of C = 2 unit

A + C per day work = 4 + 2 = 6

Ratio of the work of (A + C) and B
6 : 3

means A + C's efficiency is double of B's efficiency

if B complete a work in 48 days A + C can complete in 24 days.
Q.10) X, Y and Z can individually complete a piece of work in 27, 36 and 54 days respectively. They worked one day each, with X starting the work, followed by Y the next day and Z the next day. They continued working like that till the 24th day, after which the remaining work was completed by X and Z working on alternative days with X working on the 25th day. In how many days was the work completed?

[a] 28  
[b] 30  
[c] 32  
[d] 36

Solution (d)

Lcm of 27, 36 and 54 = 108 (total work)

One day work of X = 108/27 = 4 unit

One day work of Y = 3 unit

One day work of Z = 2 unit

In first 24 days, X, Y and Z work for 8 days each.

In 24 days the work complete by 8 * (4+3+2) = 72 unit

Remaining work = 108 - 72 = 36 unit

X and Z will complete the remaining work, working alternatively from 25th day

X will work first

The work done by X and Z for two consecutive days = 4 + 2 = 6 unit

Days taken to complete 36 unit work = 36/6 = (6 X 2) days

12 days

total days = 24 + 12 = 36 days (ans)