

ALL BRANCH (English)



General Aptitude

Quantitative Aptitude

DPP 08 Discussion Notes
Pipes & Cistern



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MCQ



Three pipes A, B and C can fill a tank in 20 minutes, 30 minutes and 45 minutes respectively. A is opened for 5 minutes and closed. B is opened for 6 minutes and then closed. In how many minutes the remaining part will be filled by C?

$$A = \frac{1}{20} ; B = \frac{1}{30} ; C = \frac{1}{45}$$

A $21\frac{3}{4}$ minutes

B $20\frac{2}{3}$ minutes $\frac{5}{20} + \frac{6}{30} + \frac{x}{45} = 1$

C $24\frac{3}{4}$ minutes

D $14\frac{3}{5}$ minutes $\Rightarrow 45 + 36 + 4x = 180$
 $\Rightarrow 4x = 99$
 $x = \frac{99}{4} = 24\frac{3}{4} \text{ min}$

MCQ

$21\frac{4}{5}$ OR 21.8

1 A & C 2 B & C 3 A & C 4 B & C ...

Three pipes A, B and C can fill a tank in 30 min, 40 min and 60 min respectively. A and B work in alternative minutes, A beginning the work whereas C works continuously. In how many minutes will the tank be filled?

- A 16.4
- B 21.8**
- C 18.2
- D 19.6

$A = \frac{1}{30}$; $B = \frac{1}{40}$; $C = \frac{1}{60}$

$1^{st} \text{ min} = \frac{1}{30} + \frac{1}{60} = \frac{3}{60} = \frac{1}{20}$

$2^{nd} \text{ min} = \frac{1}{40} + \frac{1}{60} = \frac{5}{120} = \frac{1}{24}$

$10 \times 2 \text{ min} \Rightarrow \frac{1}{20} + \frac{1}{24} = \frac{6+5}{120} = \frac{11}{120} \times 10$

$20 \text{ min} \rightarrow \frac{110}{120}$

$2^{nd} \text{ min} \rightarrow \frac{1}{12} - \frac{1}{20} = \frac{2}{60} = \frac{1}{30}$

$\frac{1}{30}$

MCQ

A tank has a leak, which would empty it in 8 hrs. A tap is turned on which admits 6 litres of water a minute into the tank, and it is now emptied in 12 hrs. How many litres does the tank hold?

$$F = 'x' \text{ hrs} ; E = 8 \text{ hrs}$$

$$\frac{1}{x} - \frac{1}{8}$$

$$\frac{1}{x} - \frac{1}{8} = \frac{1}{12}$$

$$\Rightarrow \frac{1}{x} = \frac{1}{8} + \frac{1}{12} = \frac{1}{24}$$

$$24 \text{ hrs} \times 60$$

$$= 1440 \text{ minutes}$$

Capacity of Tank

$$= 1440 \times 6$$

$$= 8640 \text{ litres}$$

A 8640

B 8460

C 8064

D 8406

MCQ



Two pipes A and B can separately fill a cistern in 60 and 75 minutes respectively. There is a third pipe at the bottom of the cistern to empty it. If all the three pipes are simultaneously opened, then the cistern is full in 50 minutes. In how much time can third pipe alone empty the cistern?

A 110 minutes

B 120 minutes

C 100 minutes

D 90 minutes

$$A = \frac{1}{60} ; \quad B = \frac{1}{75} ; \quad C = -\frac{1}{x}$$

$$\frac{1}{60} + \frac{1}{75} - \frac{1}{x} = \frac{1}{50}$$

$$\frac{5+4-6}{300} = \frac{1}{x} = \frac{3}{300} = \frac{1}{100}$$

$$\therefore x = 100$$

MCQ

One fill pipe A is 2 times faster the second fill pipe B. If A can fill a cistern in 9 minutes, then find the time when the cistern will be full if both fill pipes are opened together.

- A** 9 minutes
- B** 3 minutes
- C** 11 minutes
- D** 6 minutes

$$A = x \text{ min} ; B = 2x \text{ min}$$

$$\swarrow 9 \text{ min} ; \nwarrow 18 \text{ min}$$

$$\frac{1}{9} + \frac{1}{18} = \frac{2}{18} = \frac{1}{9} \Rightarrow \underline{\underline{9 \text{ min}}}$$

MCQ



$$\begin{array}{l} x = 10 \checkmark \\ x = -3 \times \end{array}$$

A reservoir is provided by two pipes P and Q. P can fill the reservoir 5 hours faster than Q. If both together fill the reservoir in 6 hours, the reservoir will be filled by P alone in ____.

A 10 hours

B 8 hours

C 12 hours

D 11 hours

$$P = 'x' \text{ hrs} \quad ; \quad Q = 'x+5' \text{ hrs}$$

$$P \& Q = \frac{1}{x} + \frac{1}{x+5} = \frac{1}{6}$$

$$\Rightarrow \frac{x+5+x}{x^2+5x} = \frac{1}{6} \Rightarrow$$

$$\Rightarrow 12x+30 = x^2+5x$$

$$\Rightarrow x^2-7x-30=0$$

$$\Rightarrow x^2-10x+3x-30=0$$

$$\Rightarrow x(x-10)+3(x-10)$$

MCQ

$$\frac{2}{3} \times 60 = 40 \text{ sec}$$



Two pipes A and B can fill a tank in 15 minutes and 20 minutes respectively. Both the pipes are opened together but after 4 minutes, pipe A is turned off. What is the total time required to fill the tank?

A 10 min 40 sec

B 12 min 40 sec

C 13 min 25 sec

D 14 min 40 sec

$$A = \frac{1}{15} ; B = \frac{1}{20}$$

$$x = \frac{44}{3} = 14\frac{2}{3}$$

$$\frac{4}{15} + \frac{x}{20} = 1$$

$$= 14 \text{ min } 40 \text{ sec}$$

$$\Rightarrow 16 + 3x = 60$$

$$\Rightarrow 3x = 44$$

MCQ



$$\frac{1}{5} = \frac{2}{10} = 0.2$$

Pipes A and B can fill a tank in 4 hours and 8 hours respectively. Pipe C can empty it in 16 hours. If all the three pipes are opened together, then how long will it take to fill the tank?

A 4.5 hours

B 2 hours

C 6 hours

D 3.2 hours

$$A = \frac{1}{4} ; B = \frac{1}{8} ; C = -\frac{1}{16}$$

$$A \& B \& C = \frac{1}{4} + \frac{1}{8} - \frac{1}{16} = \frac{4+2-1}{16}$$

$$= \frac{5}{16} \Rightarrow \frac{16}{5} = 3\frac{1}{5} \text{ hrs}$$

MCQ

$$\frac{1}{2} \text{ hour} = \underline{\underline{30 \text{ min}}}$$

Two pipes A and B can fill a cistern in 37.5 minutes and 45 minutes, respectively. Both pipes are opened initially. After how long pipe B is turned off, if the cistern is to be filled in half an hour?

- ☐ A 5 min
- ☒ B 9 min
- ☐ C 10 min
- ☐ D 15 min

$$A = \frac{1}{37.5} \quad ; \quad B = \frac{1}{45} \quad \Rightarrow \quad \frac{4}{5} + \frac{x}{45} = 1$$

$$\Rightarrow 36 + x = 45$$

$$\therefore x = \underline{\underline{9}}$$

$$\Rightarrow \frac{30}{37.5} + \frac{x}{45} = 1$$

$$\Rightarrow \frac{300}{375} + \frac{x}{45} = 1$$

$$\Rightarrow \frac{4}{5} + \frac{x}{45} = 1$$

MCQ

A leak can empty a tank in 8 hours. Another tap is opened which pours 5 liters of water in a minute to the tank and now it is emptied in 12 hours. How many liters does the tank hold?

- ☒ A 7200 liters
- ☐ B 120 liters
- ☐ C 720 liters
- ☐ D 6400 liters

$$A = \frac{1}{x} ; B = -\frac{1}{8}$$

$$\frac{1}{x} - \frac{1}{8} = -\frac{1}{12}$$

$$\frac{1}{x} = \frac{1}{8} - \frac{1}{12} = \frac{1}{24}$$

$$A \Rightarrow \underline{24 \text{ hrs}} \times 60 = 1440 \text{ min}$$

$$\text{Capacity} = 1440 \times 5$$

$$= \underline{7200 \text{ lit}}$$



Thank You!

GW Soldiers