

BHARAT SCHOOL OF BANKING

Pipe and Cistern

Q1. A cistern can be filled with water by a pipe in 5 hours and it can be emptied by a second pipe in 4 hours. If both the pipes are opened when the cistern is full, the time in which it will be emptied the cistern.

- (a) 9 hours
- (b) 18 hours
- (c) 20 hours
- (d) 20.5 hours
- (e) none of these

Q2. A pipe can fill a tank with water in 3 hours. Due to a leakage in bottom, it takes $3\frac{1}{2}$ hours to fill it. In what time the leak will empty the fully filled tank?

- (a) 12 hours
- (b) 21 hours
- (c) 6.5 hours
- (d) 10.5 hours
- (e) none of these

Q3. A pipe can empty a tank in 40 minutes. A second pipe with diameter twice as much as that of the first is also attached with the tank to empty it. The two pipe together can empty the tank in:

- (a) 8 minutes
- (b) $13\frac{1}{3}$ minutes
- (c) 30 minutes
- (d) 38 minutes
- (e) none of these

Q4. Two pipes can fill a tank with water in 15 and 12 hours respectively and a third pipe can empty it in 4 hours. If the pipes be opened in order at 8, 9 and 11 a.m. respectively, the tank will be emptied at

- (a) 11 : 40 a.m.
- (b) 12 : 40 p.m.
- (c) 1 : 40 p.m.
- (d) 2 : 40 p.m.
- (e) none of these

Q5. 12 pumps working 6 hours a day can empty a completely filled reservoir in 15 days. How many such pumps working 9 hours a day will empty the same reservoir in 12 days?

- (a) 15
- (b) 9
- (c) 10

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- (d) 12
- (e) none of these

Q6. A tank can be filled with water by two pipes, A and B together in 36 minutes. If the pipe B was stopped after 30 minutes, the tank is filled in 40 minutes. The pipe B can alone fill the tank in

- (a) 45 minutes
- (b) 60 minutes
- (c) 75 minutes
- (d) 90 minutes
- (e) none of these

Q7. A tank has a leak which would empty the completely filled tank in 10 hours. If the tank is full of water and a tap is opened which admits 4 litres of water per minute in the tank, the leak takes 15 hours to empty the tank. How many litres of water does the tank hold?

- (a) 2400 l
- (b) 4500 l
- (c) 1200 l
- (d) 7200 l
- (e) none of these

Q8. A boy and girl together fill a cistern with water. The boy pours 4 litres of water every 3 minutes and the girl pours 3 litres of water every 4 minutes. How much time will it take to fill 100 litres of water in the cistern?

- (a) 36 minutes
- (b) 42 minutes
- (c) 48 minutes
- (d) 44 minutes
- (e) none of these

Q9. Three pipes A, B and C can fill a cistern in 6 hours. After working as it together for 2 hours, C is closed and A and B fill it in 7 hours more. The time taken by C alone to fill the cistern is

- (a) 14 hours
- (b) 15 hours
- (c) 16 hours
- (d) 17 hours
- (e) none of these

Q10. A cistern is normally filled in 8 hours but takes another 2 hours longer to fill because of a leak in this bottom. If the cistern is full, the leak will empty it in:

- (a) 16 hours

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- (b) 20 hours
- (c) 25 hours
- (d) 40 hours
- (e) none of these

Solution

S1. Ans.(c)

$$\text{Sol. Required time} = \frac{1}{\frac{1}{5} - \frac{1}{4}} = \frac{1}{\frac{4-5}{20}} = -20$$

⇒20 hours

S2. Ans.(b)

$$\text{Sol. Required time} = \frac{1}{\frac{1}{8} - \frac{1}{7}} = \frac{1}{\frac{7-8}{56}} = 21$$

⇒21 hours

S3. Ans.(a)

Sol.

	Pipe1	Pipe2
Diameter	D	2D
	$\pi\left(\frac{D}{2}\right)^2$	$\pi\left(\frac{2D}{2}\right)^2$
	$\frac{\pi D^2}{4}$	πD^2
⇒	πD^2	$4\pi D^2$

∴ efficiency = 1 : 4

∴ Pipe – 1 will empty in 40 mint & pipe – 2 will empty in 10 minute

⇒Both together will empty in –

$$\frac{1}{\frac{1}{40} + \frac{1}{10}} \Rightarrow \frac{1}{\frac{5}{40}} \Rightarrow 8 \text{ minutes}$$

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S4. Ans.(d)

Sol.

Let tank will be emptied in 'x' hours after 8 a.m.

$$\Rightarrow \frac{x}{15} + \frac{x-1}{12} - \frac{x-3}{4} = 0$$

$$\Rightarrow \frac{x}{15} + \frac{x-1}{12} = \frac{x-3}{4} \Rightarrow x = \frac{20}{3} = 6\frac{2}{3} \text{ hrs.}$$

So, it will be emptied in $8 + 6.40$

$\Rightarrow 2 : 40 \text{ pm}$

S5. Ans.(c)

Sol. Required pumps

$$= 12 \times 6 \times 15 = x \times 9 \times 12$$

$$\Rightarrow x = 10$$

S6. Ans.(d)

Sol.

$$\frac{36}{A} + \frac{36}{B} = 1 \quad \dots (i)$$

$$\frac{40}{A} + \frac{30}{B} = 1 \quad \dots (ii)$$

$$\Rightarrow \frac{40}{A} + \frac{40}{B} - \frac{10}{B} = 1$$

$$\Rightarrow 40 \left(\frac{1}{A} + \frac{1}{B} \right) - \frac{10}{B} = 1$$

$$\Rightarrow 40 \left(\frac{1}{36} \right) - \frac{10}{B} = 1$$

$$\Rightarrow \frac{10}{B} = \frac{40}{36} - 1$$

$$\Rightarrow B = 90 \text{ minutes}$$

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S7. Ans.(d) According to question, time alone by top,

$$\frac{1}{15} - \frac{1}{10} = \frac{2-3}{30} = \frac{-1}{30}$$

⇒30 hrs

So, total water tank holds

$$30 \times 60 \times 4 = 7200 \text{ litres}$$

S8. Ans.(c)

Sol.

Qty.	Time
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Boy – 4 lt.	3 minute) ×4
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Girl – 3 lt.	4 minute) ×3
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Boy → 16 lt in 12 minute

Girl → 9 lt. in 12 minute

Total = 16 + 9 = 25 litres in 12 minute

∴ to fill 100 litres, 12 × 4 = 48 minutes

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S9. Ans.(a)

Sol.

$$\frac{1}{A} + \frac{1}{B} + \frac{1}{C} = \frac{1}{6}$$

$$\& \frac{2}{6} + \frac{7}{A+B} = 1$$

$$\Rightarrow A + B = \frac{21}{2}$$

$\Rightarrow (A+B)$ fill the tank in $\frac{21}{2}$ hrs.

So, time taken by C alone

$$\frac{1}{6} - \frac{2}{21}$$

$$\Rightarrow \frac{7-4}{42} = \frac{1}{14}$$

Required answer = 14 hrs.

S10. Ans.(d)

Sol.

Leak will empty the cistern in –

$$\frac{1}{8} - \frac{1}{8+2} = \frac{1}{8} - \frac{1}{10} = \frac{1}{40}$$

$\Rightarrow 40$ hours