



Date : 9th Dec 2023

Quantitative Aptitude – Pipes and Cistern

English

Q:1 A pipe can empty a tank in 15 hrs and another pipe can fill it in 10 hrs. If both pipes are opened simultaneously, find the time in which the tank can be filled.

1. 30 hrs
2. 25 hrs
3. 20 hrs
4. 35 hrs

Q:2 Tap A can fill a tank in 20 hours, tap B can fill it in 15 hours and tap C can empty the full tank in 60 hours. If all three pipes are opened together, in how many hours, will the tank be half filled?

1. 6 hours
2. 7 hours 30 minutes
3. 8 hours
4. 5 hours

Q:3 Three pipes P, Q and R can separately fill a cistern in 12, 15, 20 minutes respectively. How much part of the cistern will be filled in 4 minutes if all three pipes are opened simultaneously?

1. $\frac{4}{5}$
2. $\frac{1}{6}$
3. $\frac{2}{3}$
4. $\frac{2}{7}$

Q:4 Pipe A can fill the tank in 7 hours and Pipe B can empty the same tank in 9 hours. What is the time taken by the pipe to fill the tank if they both are opened together?

1. 16.25 hours
2. 33.33 hours
3. 30.5 hours
4. 31.5 hours

Q:5 Pipe A and Pipe B are fixed at bottom of the tank and they can fill the tank in 5 hours and 6 hours respectively. If there is also one hole that can empty a tank in 12 hours then find the time taken to fill the tank when the tank is completely empty and the attached pipes are in open condition.

1. 3.45 hours
2. 3.85 hours
3. 3.55 hours
4. 3.52 hours

Q:6 Pipes A and B can fill a tank in 8 and 11 hours respectively. Pipe C can empty the tank in 13 hours. If all three pipes are opened together then, the tank will be filled after how many hours?

1. 8.27 hours
2. 7.19 hours
3. 7.77 hours
4. 10 hours

Q:7 An inlet pipe can fill a tank in 20 minutes working alone and an outlet pipe can empty the same tank in 30 minutes working alone. There is a hole at half of the height of the tank that can empty the full tank in 240 minutes. What would be the time taken to fill the tank if the tank is completely empty initially?

1. 12 minutes 20 seconds
2. 12 minutes 40 seconds
3. 13 minutes 20 seconds
4. None of these

Q:8 Pipe A can fill the tank 3 times faster in comparison to pipe B. It takes 36 minutes for pipes A and B to fill the tank together. How much time will pipe B alone take to fill the tank?

1. 110 minutes
2. 101 minutes
3. 144 minutes
4. 124 minutes

Q:9 Tap A, B, and C can fill an empty tank in 12 hours, 15 hours, and 7.5 hours respectively. Initially tap A and B are opened and after 1 hour, tap C is also opened. In how many hours tank will be full?

1. 4
2. 3
3. 3.5
4. 4.5

Q:10 A and B two pipes are attached with a cistern. A can empty the full cistern in 126 minutes and B can fill the empty cistern in 1 hour. If both taps are opened for the empty cistern at 8 pm, then the cistern will be full at:

1. 9 : 54 am
2. 10 : 55 am
3. 9 : 54 pm
4. 10 : 55 pm



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Answer Key

1. (1)	2. (4)	3. (1)	4. (4)	5. (4)
6. (2)	7. (2)	8. (3)	9. (1)	10. (3)

Answers and Solutions

Q:1 The correct answer is **option 1** i.e. **30 hrs.**

According to the question,

The First Pipe can empty in 15 hrs

The second pipe can fill the tank in 10 hrs

Capacity of pipe 1 = $-1/15$

capacity of pipe 2 = $1/10$

When both pipes are open together for one hour,

$\Rightarrow (1/10) - (1/15) = 1/30$

Therefore, Time taken = 30 hrs

Q:2 The correct answer is **Option 4** i.e. **5 hours.**

Here Tap A and B are inlet taps and tap C is an outlet tap.

Total capacity of tank = LCM of 20, 15 and 60 = 60 units

Per hour efficiency of tap A = $60/20 = 3$ units

Per hour efficiency of tap B = $60/15 = 4$ units

Per hour efficiency of tap C = $-60/60 = -1$ units

Amount of tank filled when A, B and C opened together = $3 + 4 - 1 = 6$ units

Time taken by together to fill the tank half i.e. $60/2$ or 30 units = $30/6 = 5$ hours

Q:3 The correct answer is **option 1** i.e. **4/5.**

If a pipe fills a cistern in x hours its efficiency to fill the cistern in 1 hour is $1/x$.

The efficiency of pipe P to fill a cistern in 1 minute = $1/12$ part

The efficiency of pipe Q to fill a cistern in 1 minute = $1/15$ part

The efficiency of pipe R to fill a cistern in 1 minute = $1/20$ part

The efficiency of three pipes together fill a cistern in 1 minute = $1/12 + 1/15 + 1/20 = (5 + 4 + 3)/60 = 12/60$ part

The three pipes together fill a cistern in 4 minutes = $4 \times 12/60 = 48/60 = 4/5$ parts

Q:4 The correct answer is **option 4** i.e. **31.5 hours**

Suppose the capacity of the tank is L.C.M (7, 9) = 63 units

So, Amount of tank filled by Pipe A = 9 units/hours, and

Amount of tank emptied by Pipe B = 7 units/hour

If both the pipes are open together the effective work done = $9 - 7 = 2$ units/hour

Hence, the time taken = $63/2 = 31.5$ hours

Q:5 The correct answer is **option 4** i.e. **3.52 hours**

Suppose the capacity of the tank = L.C.M (5, 6, 12) = 60 units

Then,

Amount of tank filled by Pipe A = 12 units/hour,

Amount of tank filled by Pipe B = 10 units/hour, and

Amount of tank emptied by Hole = 5 units/hour

Effective work done = $12 + 10 - 5 = 17$ units/hour

Time taken = $60/17 = 3.52$ hours

Q:6 The correct answer is **option 2** i.e. **7.19 hours.**

Suppose the capacity of the tank = L.C.M (8, 11, 13) = 1144 units

Amount of tank filled by Pipe A = $1144/8 = 143$ units/hour,

Amount of tank filled by Pipe B = $1144/11 = 104$ units/hour,

Amount of tank emptied by Pipe C = $1144/13 = 88$ units/hour

Effective work done = $(143 + 104 - 88) = 159$ units/hour

Time taken = $1144/159 = 7.19$ hours

Q:7 The correct answer is **option 2** i.e. **12 minutes 40 seconds**

The hole in the tank can empty the half tank in 120 minutes.

Let the total capacity of the tank will be L.C.M (20, 30, 120) i.e. 120 units.

Efficiency of the first pipe = $120/20 = 6$ units/minute

Efficiency of the second pipe = $120/30 = 4$ units/minute

Efficiency of the hole = $120/120 = 1$ units/minute

Total time is taken to fill the half-tank = $60/(6 + 4) \Rightarrow 6$ minutes

Total time taken to fill the next half tank = $(60)/(6 + 4 - 1)$

$\Rightarrow 20/3$ minutes or 6 minutes 40 seconds



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Total time taken = 12 minutes 40 seconds

Q:8 The correct answer is **option 3** i.e. **144 minutes**

Let the time taken by pipe B be x minutes

So, the time taken by pipe A = $x/3$ minutes

Thus, $(1/3) + (3/x) = 1/36$

$\Rightarrow 4/x = 1/36$

$\Rightarrow x = 4 \times 36$

$\Rightarrow x = 144$ minutes

Q:9 The correct answer is **option 1** i.e. **4 hours**

Given,

A can fill the tank in = 12 hours

B can fill the tank in = 15 hours

C can fill the tank in = 7.5 hours

Total capacity of tank = LCM of 12, 15 and 7.5 = 60 units

Efficiency of A = $60/12 = 5$

Efficiency of B = $60/15 = 4$

Efficiency of C = $60/7.5 = 8$

Now, Tap A and B are opened for 1 hour.

So, part of tank filled by (A + B) in 1 hour = $(5 + 4)$
= 9 units

Remaining part to be filled = $60 - 9 = 51$ units

Now time taken by (A + B + C) to fill the remaining tank = $51/(5 + 4 + 8) = 51/17 = 3$ hours.

Therefore, the total time taken by all three taps according to the given condition is $(1 + 3)$ hr = 4 hours

Q:10 The correct answer is **option 3** i.e. **9 : 54 pm.**

Given,

A = 126 min (work as negative)

B = 60 min

Total capacity of the cistern = LCM of 60 and 126 = 1260 liters

Efficiency of A = $1260/126 = 10$

Efficiency of B = $1260/60 = 21$

Net efficiency = $21 - 10 = 11$

Now,

Total time = total capacity/net efficiency = $1260/11$
= 114.54 min

Started at 8 pm: 8 pm + 114.54 min = **9:54 pm**
(around)