



PIPE & CISTERN SHORT TRICKS & QUESTIONS WITH SOLUTIONS

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Problems containing pipes and cisterns fall broadly into one of two categories. The first category being one wherein questions are concerned with the time required to fill up a tank, with a combination of one or more pipes and cisterns. The second category, concerns itself with leakages and holes, requiring you to calculate the effective rate of the tank being filled or emptied.

The same principle of Time and Work is employed to solve the problems on Pipes and Cisterns. The only difference is that in this case, the work done is in terms of filling or emptying a cistern (tank) and the time taken is the time taken by a pipe or a leak (crack) to fill or empty a cistern respectively.

Inlet : A pipe connected with a tank (or a cistern or a reservoir) is called an inlet, if it fills it.

Outlet : A pipe connected with a tank is called an outlet, if it empties it.

⇒ If a pipe can fill a tank in x hours, then the part filled in 1 hour = $1/x$

⇒ If a pipe can empty a tank in y hours, then the part of the full tank emptied in 1 hour = $1/y$

⇒ If a pipe can fill a tank in x hours and another pipe can empty the full tank in y hours, then the net part filled in 1 hour, when both the pipes are opened $1/x - 1/y$

Time taken to fill the tank, when both the pipes are opened = $xy / y - x$

⇒ If a pipe can fill or empties tank in x hours and another can fill or empties the same tank in y hours, then time taken to fill or empty the tank $xy / y + x$, when both the pipes are opened

⇒ If a pipe fills a tank in x hours and another fills the same tank in y hours, but a third one empties the full tank in z hours, and all of them are opened together, then net part filled in 1 hr = $1/x + 1/y - 1/z$

⇒ A pipe can fill a tank in x hrs. Due to a leak in the bottom it is filled in y hrs. If the tank is full, the time taken by the leak to empty the tank = $xy / y - x$ Hours.

⇒ A cistern has a leak which can empty it in X hours. A pipe which admits Y litres of water per hour into the cistern is turned on and now the cistern is emptied in Z hours. Then the capacity of the cistern is = $X + Y + Z / Z - X$ hours.

Shortcut Methods for Pipes and Cisterns

Rule 1: Two pipes can fill (or empty) a cistern in x and y hours while working alone. If both pipes are opened together, then the time taken to fill (or empty) the cistern is given by

$$\left(\frac{xy}{x + y} \right) \text{ hours}$$

Example

Rule 2: Three pipes can fill (or empty) a cistern in x , y and z hours while working alone. If all the three pipes are opened together, the time taken to fill (or empty) the cistern is given by

$$\frac{xyz}{xy + yz + zx} \text{ hours}$$

Example

Rule 3: If a pipe can fill a cistern in x hours and another can fill the same cistern in y

hours, but a third one can empty the full tank in z hours, and all of them are opened together, then

$$\text{Net part filled in 1 hour} = \frac{1}{x} + \frac{1}{y} - \frac{1}{z}$$

$$\text{Time taken to fill the full cistern} = \frac{x}{yz + x}$$

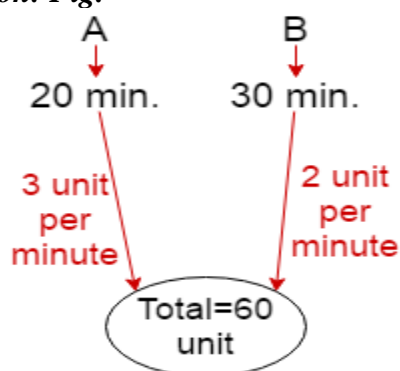
Example

Rule 4: A pipe can fill a cistern in x hours. Because of a leak in the bottom, it is filled in y hours. If it is full, the time taken by the leak to empty the cistern is

$$\frac{xy}{y - x} \text{ hours}$$

(Q1) Two pipes A and B can fill a tank in 20 minutes and 30 minutes respectively. If both pipes are opened together, the time taken to fill the tank is.

Solution: Fig.



Rate of Filling the tank by A and B in 1 minute = $3 + 2 = 5$ unit

So, total time taken by Pipe (A+B) = $60/5 = 12$ minutes Ans.

[Concept: First step-L.C.M=20,30=60 i.e total unit. now $60/20=3$ unit per minutes tank filling by pipe A and $60/30=2$ unit per minutes tank filling by pipe B.]

(Q2) A tap can empty a tank in 30 minutes. A second tap can empty it in 45 minutes. If both the taps operate simultaneously, how much time is needed to empty the tank?

Solution: Fig.



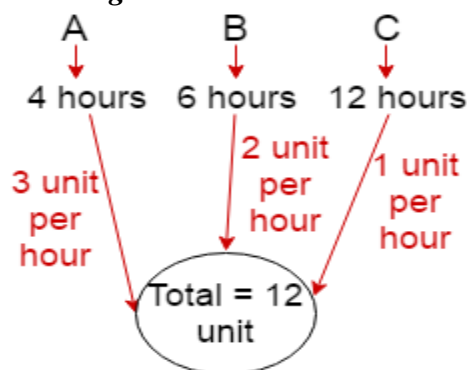
Rate of emptying the tank by 1st and 2nd tap in 1 minute = $(3+2) = 5$ unit

So, total time taken by (1st+2nd) tap = $90/5 = 18$ minutes Ans.

[Concept: First step-L.C.M=30,45=90 i.e total unit. now $90/30=3$ unit per minutes tank emptying by 1st tap and $90/45=2$ unit per minutes tank emptying by 2nd tap.]

(Q3) Three tapes A, B, C can fill an overhead tank in 4, 6 and 12 hours respectively. How long would the three tapes take to fill the tank if all of them are opened together?

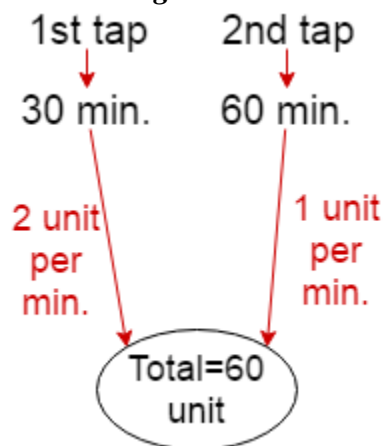
Solution: Fig.



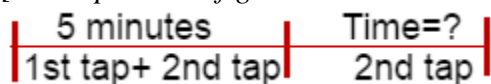
Rate of Filling the tank by A, B and C in 1 hour $= (3+2+1)$
 $= 6$ unit
 So, total time taken by $(A+B+C) = 12/6$
 $= 2$ hours Ans.

Type-1.1

(Q1) A water tank can be filled by a tap in 30 minutes and another tap can fill it in 60 minutes. If both the taps are kept open for 5 minutes and then the first tap is closed, how much time the 2nd tap will take to fill the remaining tank.

Solution: Fig.

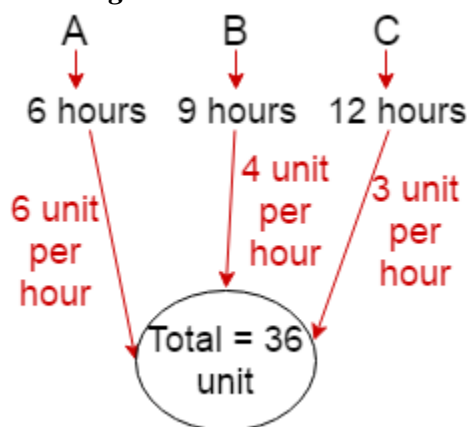
Rate of Filling the tank by 1st tap and 2nd tap in 1 minute $= (2+1)$
 $= 3$ unit
 [Concept: From fig.



Rate of Filling the tank by 1st tap and 2nd tap in 5 minutes $= 5 \times 3 = 15$ unit
 Remaining $= 60 - 15 = 45$ unit that is filled by 2nd tap
 So, total time taken by 2nd tap $= 45/1$
 $= 45$ minutes Ans.

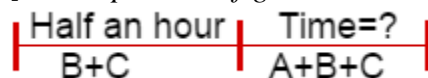
(Q2) Three pipes A, B and C can fill a tank in 6 hours, 9 hours and 12 hours respectively. B and C are opened for half an hour, then A is also opened. The time taken

by the three pipes together to fill the remaining part of the tank is.

Solution: Fig.

Rate of Filling the tank by A+B+C in 1 hour $= (6+4+3)$ unit
 $= 13$ unit

[Concept: From fig.]



Rate of Filling the tank by B+C in 1 hour $= (4+3)$ unit
 $= 7$ unit

Rate of Filling the tank by B+C in half an hour $= 7/2$ unit

Remaining unit $= 36 - (7/2) = 65/2$ unit

So, total time taken by $(A+B+C) = (65/2)/13$
 $= 2 \frac{1}{2}$ hours Ans.

(Q3) Three pipes A, B and C can fill a tank in 6 hours. After working together for 2 hours, C is closed and A and B fill the tank in 8 hours. The time (in hours) in which the tank can be filled by pipe C alone is.

Solution:

Let tank fill by A+B+C in 1 hour $= 1$ unit

Tank fill by A+B+C in 6 hour $= 6$ unit

After working together for 2 hours then

Tank fill by A+B+C in 2 hour $= 2$ unit

Remaining $= 6 - 2 = 4$ unit that is filled by A and B because C is closed

Rate of filling of A+B in 1 hour = $4/8 = 0.5$ unit

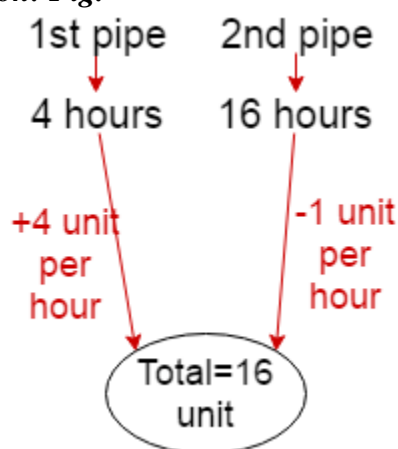
Rate of filling of C in 1 hour = $1 - 0.5 = 0.5$ unit

Time taken by C = $6/0.5 = 12$ hours Ans.

Type-1.2

(Q1) A tank has two pipes. The first pipe can fill it in 4 hours and the second can empty it in 16 hours. If two pipes are opened together at a time, then the tank will be filled in.

Solution: Fig.



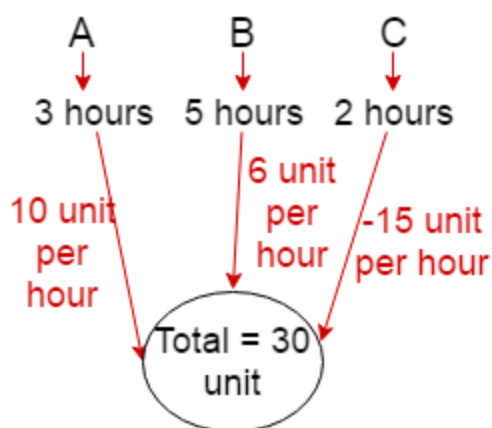
Rate of filling the tank by 1st pipe = 4 unit per hour

Rate of emptying the tank by 2nd pipe = 1 unit per hour

Net rate of filling the tank = $4 - 1 = 3$ unit
so required time = $16/3 = 5 \frac{1}{3}$ hours Ans.

(Q2) Two pipes A and B can fill a cistern in 3 hours and 5 hours respectively. Pipe C can empty in 2 hours. If all the three pipes are open, in how many hours the cistern will be full?

Solution: Fig.



Rate of filling a cistern by A = 10 unit per hour

Rate of filling a cistern by B = 6 unit per hour

Rate of emptying a cistern by C = -15 unit per hour

Net rate of filling the tank by (A+B-C) = $10 + 6 - 15$

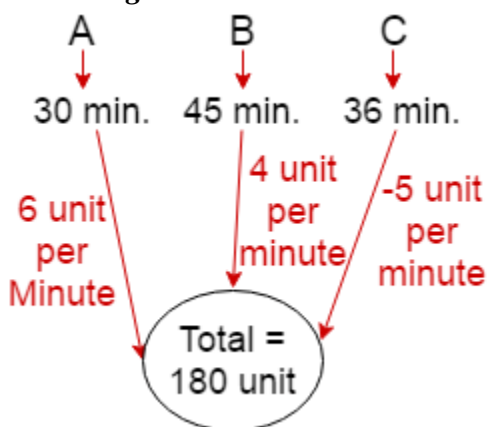
= 1 unit per hour

so total time taken by (A+B-C) = $30/1 = 30$ hours Ans.

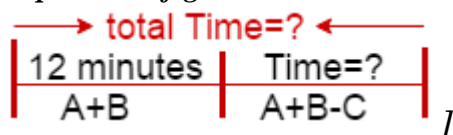
Type-1.3

(Q1) Two pipes A and B can fill a tank with water in 30 minutes and 45 minutes respectively. Another pipe C can empty the tank in 36 minutes. First A and B are opened. After 12 minutes, C is also opened. The tank is filled up in.

Solution: Fig.



[Concept: From fig.



Rate of filling the tank by $(A+B)$ in 1

minute $= (6+4) = 10$ unit

Rate of filling the tank by $(A+B)$ in 12

minute $= 12 \times 10 = 120$ unit

Remaining $= 180 - 120 = 60$ unit that is filled

by A, B and C

Rate of emptying the tank by C $= -5$ unit per minute

Net rate of filling the tank by $(A+B-$

$C) = (6+4-5)$

$= 5$ unit per minute

so required time taken by $(A+B-C) = 60/5$

$= 12$ minutes

Total time $= 12 + 12 = 24$ minutes Ans.

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Pipes & Cistern Questions

Q1. Two pipes B and F can fill the tank in 10 hours and 15 hours, respectively. If both the pipes are opened along with an outlet pipe M, then the tank is filled in 30 hours. Help me to find out how much time will the outlet pipe take to empty the full tank.

- a) $3\frac{1}{2}$ hours
- b) $4\frac{1}{2}$ hours
- c) $5\frac{1}{2}$ hours
- d) $7\frac{1}{2}$ hours
- e) None of these

Q2. Three pipes A, B and C can fill a tank in 15 minutes, 20 minutes and 30 minutes respectively. The pipe C is closed 6 minutes before the tank is filled. In what time the tank will be full?

- (a) 6 minutes
- (b) 8 minutes
- (c) 12 minutes
- (d) 14 minutes
- (e) None of these

Q3. One filling pipe A is 5 times faster than second filling pipe B. If B can fill a cistern in 36 minutes, the find the time when the cistern will be full if both fill pipes are opened together.

- (a) 6 minutes
- (b) 8 minutes
- (c) 4 minutes
- (d) 12 minutes
- (e) None of these

Q4. Pipe A can fill an empty tank in 30 hours while B can fill it in 45 hours. Pipe A

and B are opened and closed alternatively i.e., first pipe A is opened, then B, again A and then B and so on for 1 hour each time without any time lapse. In how many hours the tank will be filled if it was empty, initially?

- (a) 36
- (b) 54
- (c) 48
- (d) 60
- (e) None of these

Q5. A cistern can be filled by two taps A and B coming from the same main pipeline in 20 and 30 minutes respectively. Both the taps are opened at the same time but due to partial closing of a valve in the main pipeline, tap A was supplying only $\frac{4}{5}$ th of its capacity and tap B, $\frac{5}{6}$ th of its capacity. After some time, the valve in the main pipeline was opened fully thereby enabling the two taps to supply at full capacity. It took another 5 minutes to fill the cistern completely. How long (approx) was it before the valve on the main pipeline opened?

- a) 7 min
- b) 9 min
- c) 11 min
- d) 13 min
- e) 5 min

Q6. A tank has three pipes. The first pipe can fill $\frac{1}{2}$ part of the tank in 1 hour and the second pipe can fill $\frac{1}{3}$ part in 1 hour. The third pipe is for making the tank empty. When all the three pipes are open, $\frac{7}{12}$ th part of the tank is filled in 1 hours. How much time will the third pipe take to empty the completely filled tank?

- a) 3 hours
- b) 4 hours
- c) 5 hours
- d) 6 hours
- e) None of these

Q7. Two taps can separately fill a tank in 12 min and 15 min. The first tap was replaced with a tap of double the radius and the second tap was replaced with a tap of half the radius. Now in what time will the tank get filled?

- a) $2\frac{6}{7}$ minutes
- b) $2\frac{5}{7}$ minutes
- c) 2 minutes
- d) $1\frac{1}{7}$ minutes
- e) None of these

Q8. A bath can be filled by the cold water pipe in 20 minutes and by the hot water pipe in 30 minutes. A person leaves the bathroom after turning on both pipes simultaneously and returns at the moment when the bath should be full. Finding, however, that the waste pipe has been open, he now closes it. In 6 minutes more the bath is full. In what time would the waste pipe empty it?

- a) 16 min
- b) 29 min
- c) 24 min
- d) 27 min
- e) None of these

Q9. A water tank can be filled by a tap in 30 minutes and another tap can fill it in 60 minutes. If both the taps are kept open for 5 minutes and then the first tap is closed, how long will it take for the tap to fill the remaining part of the tank?

- a) 20 minutes
- b) 25 minutes
- c) 30 minutes
- d) 45 minutes
- e) None of these

Q10. Pipe A can fill a tank in 36 minutes and pipe B can fill it in 45 minutes. If both the pipes are opened to fill an empty tank, in how many minutes will it be full?

- a) 15
- b) 18
- c) 20
- d) 25
- e) None of these

Q11. Tap A can fill the empty tank in 12 hours, but due to a leak in the bottom it is filled in 15 hours. If the tank is full and then tap A is closed then in how many hours the leak can empty it?

- a) 45 hours
- b) 48 hours
- c) 52 hours
- d) 60 hours
- e) None of these

Q12. Pipe A and Pipe B can fill a cistern in 10 hours and 15 hours respectively. When a third pipe C which works as an outlet pipe is also open then the cistern can be filled in 18 hours. The outlet pipe can empty a full cistern in:

- a) 12 hours
- b) 8 hours
- c) 9 hours
- d) 14 hours
- e) None of these

Q13. A cistern has a leak which would empty it in 6 hours. A tap is turned on which fills the cistern @ 10 liters per hour and when the tank is full then it is emptied in 15 hours(when tap and the leak are active). What is the capacity of the cistern?

- a) 100 litres
- b) 150litres
- c) 120litres
- d) None of these
- e) Can't be determined

Q14. Tap A fills a tank in 10 hours and B can fill it in 15 hours. Both are opened simultaneously. Sometimes later tap B was closed, then it takes total 8 hours to fill up the whole tank. After how many hours B was closed?

- a) 2
- b) 3
- c) 4
- d) 5
- e) None of these

Q15. Tap A can fill a tank in 20 hours, B in 25 hours but tap C can empty a full tank in 30 hours. Starting with A, followed by B and C each tap opens alternatively for one hour period till the tank gets filled up completely. In how many hour the tank will be filled up completely?

- a) $51\frac{11}{15}$ hours
- b) $52\frac{2}{3}$ hours
- c) $24\frac{4}{11}$ hours
- d) None of these
- e) Can't be determined

Q16. If one pipe A can fill a tank in 20 minutes, then 5 pipes, each of 20% efficiency of A, can fill the tank in:

- a) 80
- b) 100 min
- c) 20 min
- d) 25 min
- e) None of these

Q17. A tank is filled by three pipes with uniform flow. The first two pipes operating simultaneously fill that tank in the same time during which the tank is filled by the third pipe alone. The second pipe fills the tank 5 hours faster than the first pipe and 4 hours slower than the third pipe. The time required by the first pipe is:

- a) 6 hours
- b) 10 hours
- c) 15 hours
- d) 30 hours
- e) None of these

Q18. 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 minutes 20 seconds
- b) 11 minutes 45 seconds
- c) 12 minutes 30 seconds
- d) 14 minutes 40 seconds
- e) None of these

Q19. A tap can fill a tank in 6 hours. After half the tank is filled, three more similar taps are opened. What is the total time taken to fill the tank completely?

- a) 3 hours 15 minutes

- b) 3 hours 45 minutes
- c) 4 hours
- d) 4 hours 15 minutes

Q20. Two pipes A and B can fill a cistern in 4 hours. Had they been opened separately, then B would have taken 6 hours more than A to fill the cistern. How much time will be taken A by A to fill the cistern separately?

- a) 1 hour
- b) 2 hours
- c) 6 hours
- d) 8 hours
- e) None of these

Q21. Two pipes A and b can fill a tank in 36 hrs and 45 hrs respectively. If both pipes are opened simultaneously, how much time will be taken to fill the tank?

- a) 20
- b) 25
- c) 26
- d) 27
- e) 28

Q22. A cistern can be filled by a tap in 4hrs while it can be emptied by another tap in 9 hrs. If both pipes are opened simultaneously, then after how much time will the cistern get filled?

- a) 4.5 hours
- b) 5 hours
- c) 6.5 hours
- d) 7.2 hours
- e) 7.5 hours

Q23. Pipes A and B can fill a tank in 5 and 6 hours respectively. Pipe C can empty it in 12 hours. If all the three pipes are opened together, then the tank will be filled in:

- a) $1\frac{13}{17}$ hours
- b) $2\frac{8}{11}$ hours
- c) $3\frac{9}{17}$ hours
- d) $4\frac{1}{2}$ hours
- e) None of these

Q24. Three taps A,B and C can fill a tank in 12,15 and 20 hours respectively. If A is opened all the time and B and C are opened one hour each alternatively , the tank will be full in :

- a) 4
- b) 4.5
- c) 5
- d) 5.5
- e) None of these

Q25. A pump can fill a tank with water in 2 hours. Because of a leak, it took $2\frac{1}{3}$ hours to fill the tank. The leak can drain all the water of the tank in:

- a) 6 hours
- b) 7 hours
- c) 8 hours
- d) 14 hours
- e) None of these

Q26. Two pipes A and B can fill a cistern in 37.5 minutes and 45 minutes respectively. Both pipes are opened. The cistern will be filled in just half an hour, if the B is turned off after:

- a) 5 min.
- b) 9 min.
- c) 10 min.
- d) 15 min.
- e) None of these

Q27. A tank is filled in 5 hours by three pipes A, B and C. The pipe C is twice as fast as B and B is twice as fast as A. How much time will pipe A alone take to fill the tank?

- a) 20 hours
- b) 25 hours
- c) 35 hours
- d) Cannot be determined
- e) None of these

Q28. Two pipes A and B together can fill a cistern in 4 hours. Had they been opened separately, then B would have taken 6 hours more than A to fill the cistern. How much time will be taken by A to fill the cistern separately?

- a) 1 hour
- b) 2 hours
- c) 6 hours
- d) 8 hours
- e) None of these

Q29. A tank is filled by three pipes with uniform flow. The first two pipes operating simultaneously fill the tank in the same time during which the tank is filled by the third pipe alone. The second pipe fills the tank 5 hours faster than the first pipe and 4 hours slower than the third pipe. The time required by the first pipe is:

- a) 6 hours
- b) 10 hours
- c) 15 hours
- d) 30 hours
- e) 25 hours

Q30. Two pipes can fill a tank in 20 and 24 minutes respectively and a waste pipe can empty 3 gallons per minute. All the three

pipes working together can fill the tank in 15 minutes. The capacity of the tank is:

- a) 60 gallons
- b) 100 gallons
- c) 120 gallons
- d) 180 gallons
- e) None of these

Q31. A booster pump can be used for filling and emptying a tank. The capacity of the tank is 2400 m^3 . The emptying capacity of the pump is 10 m^3 per minute higher than its filling capacity and the pump needs 8 minutes lesser to empty the tank than it needs to fill it. What is the filling capacity of the pump?

- a) $50 \text{ m}^3 / \text{min}$
- b) $60 \text{ m}^3 / \text{min}$
- c) $72 \text{ m}^3 / \text{min}$
- d) $53 \text{ m}^3 / \text{min}$
- e) None of these

Q32. Three pipes A, B and C can fill a tank in 6 hours. After working at it together for 2 hours, C is closed and A and B can fill the remaining part in 7 hours. The number of hours taken by C alone to fill the tank is:

- a) 10
- b) 12
- c) 14
- d) 16
- e) 18

Q33. Bucket P has thrice the capacity of bucket Q. It takes 60 turns for bucket P to fill the empty drum. How many turns it will take for both the buckets P and Q, having each turn together to fill the empty drum.

- a) 30
- b) 40
- c) 45

- d) 90
e) None of these

Q34. Two pipes A and B can fill a tank in 20 and 30 minutes respectively. If both the pipes are used together, then how long it will take to fill the tank?

- a) 10 minutes
b) 12 minutes
c) 15 minutes
d) 20 minutes
e) None of these

Q35. A cistern can be filled by a tap in 4 hours while it can be emptied by another tap in 9 hours. If both the taps are opened simultaneously, then after how much time cistern will get filled ?

- a) 7 hours
b) 7.1 hours
c) 7.2 hours
d) 7.3 hours
e) None of these

Q36. A tap can fill a tank in 6 hours. After half the tank is filled then 3 more similar taps are opened. What will be total time taken to fill the tank completely.

- a) 2 hours 30 minutes
b) 2 hours 45 minutes
c) 3 hours 30 minutes
d) 3 hours 45 minutes
e) None of these

Q37. A water tank is two-fifth full. Pipe A can fill a tank in 10 minutes and pipe B can empty in 6 minutes. If both the pipes are open, how long will it take to empty or fill the tank completely?

- a) 6 min to empty

- b) 7 min to full
c) 6 min to full
d) 7 min to empty
e) None of these

Q38. Pipe A can fill a tank in 5 hours, pipe B in 10 hours and pipe C in 30 hours. If all the pipes are open, in how many hours will the tank be filled?

- a) 2.5 hours
b) 2 hours
c) 3.5 hours
d) 3 hours
e) None of these

Q39. Pipes A and B can fill a tank in 5 hours and 6 hours respectively. Pipe C can empty it in 12 hours. If all the three pipes are opened together, then the tank will be filled in.

- a) $3\frac{9}{5}$
b) $3\frac{9}{17}$
c) $3\frac{7}{5}$
d) $3\frac{7}{17}$
e) None of these

Q40. A leak in the bottom of a tank can empty the full tank in 6 hours. An inlet pipe fills water at the rate of 4 litres a minute. When the tank is full, the inlet is opened and due to the leak the tank is empty in 8 hours. The capacity of the tank (in litres) is

- a) 5780 litres
b) 5770 litres
c) 5760 litres
d) 5750 litres
e) None of these

Q41. An electric pump can fill a tank in 3 hours. Because of a leak in the tank, it took

3 hours 30 min to fill the tank. In what time the leak can drain out all the water of the tank and will make tank empty ?

- a) 10 hours
- b) 13 hours
- c) 17 hours
- d) 21 hours
- e) None of these

Q42. A tank can be filled by a tap in 20 minutes and by another tap in 60 minutes. Both the taps are kept open for 10 minutes and then the first tap is shut off. After this, the tank will be completely filled in what time ?

- a) 10 mins
- b) 15 mins
- c) 20 mins
- d) 25 mins
- e) None of these

Q43. A cistern can be filled in 9 hours but due to a leak at its bottom it takes 10 hours. If the cistern is full, then the time that the leak will take to make it empty will be ?

- a) 20 hours
- b) 19 hours
- c) 90 hours
- d) 80 hours
- e) None of these

Q44. Taps A and B can fill a bucket in 12 minutes and 15 minutes respectively. If both are opened and A is closed after 3 minutes, how much further time would it take for B to fill the bucket?

- a) 8 min 15 sec
- b) 7 min 15 sec
- c) 6 min 15 sec
- d) 5 min 15 sec

e) None of these

Q45. A tank is filled by three pipes with uniform flow. The first two pipes operating simultaneously fill the tank in the same time during which the tank is filled by the third pipe alone. The second pipe fills the tank 5 hours faster than the first pipe and 4 hours slower than the third pipe. Find the time required by the first pipe to fill the tank?

- a) 10 hours
- b) 15 hours
- c) 17 hours
- d) 18 hours
- e) None of these

Q46. One pipe can fill a tank three times as fast as another pipe. If together the two pipes can fill the tank in 36 minutes, then the slower pipe alone will be able to fill the tank in

- a) 144 mins
- b) 140 mins
- c) 136 mins
- d) 132 mins
- e) None of these

Q47. 12 buckets of water fill a tank when the capacity of each tank is 13.5 litres. How many buckets will be needed to fill the same tank, if the capacity of each bucket is 9 litres?

- a) 15 buckets
- b) 17 buckets
- c) 18 buckets
- d) 19 buckets
- e) None of these

Q48. A tank can be filled by two pipes A and B in 60 minutes and 40 minutes respectively.

How many minutes will it take to fill the tank from empty state if B is used for the first half time and then A and B fill it together for the other half.

- a) 15 mins
- b) 20 mins
- c) 25 mins
- d) 30 mins
- e) None of these

Q49. Two pipes A and B can fill a tank in 6 hours and 4 hours respectively. If they are opened on alternate hours and if pipe A is opened first, in how many hours, the tank shall be full ?

- a) 3 hours
- b) 5 hours
- c) 7 hours
- d) 10 hours
- e) None of these

Q50. There are two pipes which are functioning simultaneously to fill a tank in 12 hours, if one pipe fills the tank 10 hours faster than other than how many hours second pipe will take to fill the tank ?

- a) 30 hours
- b) 35 hours
- c) 40 hours
- d) 42 hours
- e) None of these

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Solutions

Q1. Option (D)

Pipe B and F together can fill in 1 hr

$$\left(\frac{1}{10} + \frac{1}{15}\right) = \frac{1}{6} \text{ th of the tank}$$

When the drain pipe M is also open it takes 30 hrs to fill the tank. Let us assume that the pipe M can empty out a full tank in m hrs

So we get when B + F and -M are all working, the tank level is rising $(1/6 - 1/m)$ per hour

Given that in that condition the tank fills up

$$\text{in 30 hrs. So } \left(\frac{1}{6} - \frac{1}{m}\right) = \frac{1}{30}$$

$$\text{Or } \frac{1}{m} = \frac{1}{6} - \frac{1}{30} = \frac{4}{30}$$

So independently the pipe M can empty a full tank in $30/4$ Or 7.5 hrs

Q2. Option (B)

$$\text{work done in last 6 minutes} = 6 \times \left(\frac{1}{15} + \frac{1}{20}\right) = \frac{42}{60}$$

$$\text{remaining work} = 1 - \frac{42}{60} = \frac{18}{60}$$

$$\text{per minute work of A, B and C together} = \frac{1}{15} + \frac{1}{20} + \frac{1}{30} =$$

$$\frac{18}{60} \\ \text{Total no. of minutes} = \frac{18}{\frac{18}{60}} + 6 = 8 \text{ minutes}$$

Q3. Option (A)

	A	B
Effi	5	1
Time	1	5

$$\text{time taken by A to fill the tank} = \frac{36}{5} \text{ minutes}$$

$$\begin{array}{l} 5 \text{ --- A --- } \frac{36}{5} \\ 1 \text{ --- B --- } 36 \end{array} \rightarrow 36$$

$$\text{Both pipe fill the tank together} = \frac{36}{x} = 6 \text{ minute}$$

Q4. Option (A)

In 2 hr, tank will be filled by $3 + 2 = 5$ unit

$$\begin{array}{l} A = 30 \xrightarrow{3} \\ B = 45 \xrightarrow{2} \end{array} 90$$

$$\text{Total time taken} = \frac{90}{5} = 18$$

$$18 \times 2 = 36 \text{ hr}$$

Q5. Option (B)

Let's assume the cistern's capacity = 60 litres

$$\text{So, A supplies} = \frac{60}{20} = 3 \text{ litre/min}$$

$$\text{B supplies} = \frac{60}{30} = 2 \text{ litre/min}$$

Now, due to closing of valve

$$\text{A supplies} = 3 \times \frac{4}{5} = \frac{12}{5} \text{ litre/min}$$

$$\text{B supplies} = 2 \times \frac{5}{6} = \frac{5}{3} \text{ litre/min}$$

In last 5 minutes cistern is filled at full capacity of pipes, and it is filled by $= 5 \times (3 + 2) = 25$ litre

$$\text{Remaining capacity} = 60 - 25 = 35$$

$$\text{So required time} = \frac{35}{\frac{17}{3}} = 9 \text{ min (approx)}$$

Q6. Option (B)

Let the 3rd pipe can empty full tank in x hours

$$\frac{1}{2} + \frac{1}{3} - \frac{1}{x} = \frac{7}{12}, x = 4 \text{ hours}$$

Q7. Option (A)

$$\text{Replaced first tap can fill tank in} = \frac{1}{4} \times 12 = 3 \text{ minutes}$$

$$\text{Replaced second tap can fill tank in} = 4 \times 15 = 60 \text{ minutes}$$

Both taps can fill it together in

$$\begin{aligned} &= \frac{1}{\frac{1}{3} + \frac{1}{60}} \\ &= 2\frac{6}{7} \text{ minutes} \end{aligned}$$

Q8. Option (C)

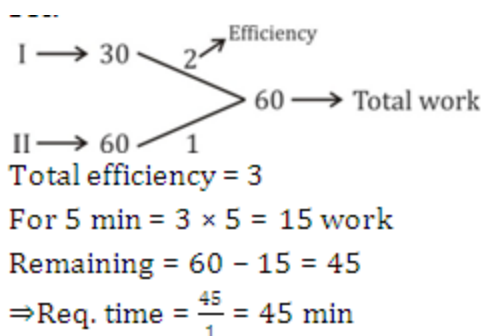
$$\text{Per minute fill by both pipes} = \frac{1}{20} + \frac{1}{30} = \frac{1}{12}$$

$$\text{In last 6 minutes, part of tank filled} = \frac{1}{12} \times 6 = \frac{1}{2}$$

$$\text{Filled in first 12 minutes} = 1 - \frac{12}{x} = \frac{1}{2}, x = 24$$

Thus waste pipe would empty it in 24 minutes.

Q9. Option (D)

**Q10. Option (C)**

Efficiency of A = 2.78%

Efficiency of B = 2.22%

 \therefore Combined efficiency of A and B = 5% (2.78 + 2.22)Thus, it will take total of $\frac{100}{5} = 20$ minutes**Q11. Option (D)**

Efficiency of A = 8.33%

Effective efficiency = 6.67%, when there is leakage

 \therefore Efficiency of leakage = 1.66% = (8.33 - 6.67)It means due to leakage a full tank will be empty in $\frac{100}{1.66} = 60$ hours**Q12. Option (C)**Efficiency of A + B = $10 + 6.66 = 16.66\%$

Efficiency of A + B + C = 5.55%

 \therefore Efficiency of C (outlet pipe) = $16.66 - 5.55 = 11.11\%$

It means outlet pipe C can empty in 9 hours.

Q13. Option (A)

Efficiency of only leakage = 16.66%

Effective efficiency of leakage = 6.66%

It means the capacity of filling pipe = 10%

Therefore, the inlet pipe can fill the tank in 10 hours hence the capacity of tank = 100l

Q14. Option (B)

Efficiency of tap A and B = 16.66% = (10 + 6.66)

 $\therefore 16.66x + 10 \times (8 - x) = 100\%$ $\Rightarrow x = 3$ **Q15. Option (A)**Portion filled in 3 hours = $\frac{1}{20} + \frac{1}{25} - \frac{1}{30} = \frac{17}{300}$ \therefore Portion filled in 3×17 hours = $\frac{17}{300} \times 17 = \frac{289}{300}$ Remaining portion = $1 - \frac{289}{300} = \frac{11}{300}$ which will be filled by A in $\frac{11}{300} \times 20 = \frac{11}{15}$ hoursSo, total time = $51 \frac{11}{15}$ hours**Q16. Option (C)**

A can fill the tank in 20 minutes

5 pipes of 20% efficiency of A will be equivalent to pipe A

So, same time is required to fill the tank i.e. 20 minutes.

Q17. Option (C)Suppose, first pipe alone takes x hours to fill the tank

Then, second and third pipes will take

 $(x - 5)$ and $(x - 9)$ hours respectively to fill the tank

$$\frac{1}{x} + \frac{1}{x-5} = \frac{1}{x-9}$$

$$\frac{x-5+x}{x(x-5)} = \frac{1}{x-9}$$

$$(2x-5)(x-9) = x(x-5)$$

$$x^2 - 18x + 45 = 0$$

$$(x-15)(x-3) = 0$$

therefore, $x = 15$ [neglecting $x = 3$]**Q18. Option (D)**

$$\text{Part filled in 4 minutes} = 4 \left(\frac{1}{15} + \frac{1}{20} \right) = \frac{7}{15}$$

$$\text{Remaining part} = \left(1 - \frac{7}{15} \right) = \frac{8}{15}$$

$$\text{Part filled by B in 1 minute} = \frac{1}{20}$$

$$\frac{1}{20} : \frac{8}{15} :: 1 : x$$

$$x = \left(\frac{8}{15} \times 1 \times 20 \right) = 10 \frac{2}{3} \text{ minutes} = 10$$

minutes 40 seconds

The tank will be full in (4 minutes + 10 minutes + 40 seconds) = 14 minutes 40 seconds

Q19. Option (B)

Time taken by one tap to fill half of the tank = 3 hours

Part filled by the four taps in 1 hour =

$$\left(4 \times \frac{1}{6} \right) = \frac{2}{3}$$

$$\text{Remaining part} = \left(1 - \frac{1}{2} \right) = \frac{1}{2}$$

$$x = \left(\frac{1}{2} \times 1 \times \frac{3}{2}\right) = \frac{3}{4} \text{ hours i.e 45 minutes}$$

So, total time taken = 3 hours, 45 minutes

Q20. Option (C)

Let the cistern be filled by pipe A alone in x hours

Then, pipe B will fill it in $(x + 6)$ hours

$$\frac{1}{x} + \frac{1}{x+6} = \frac{1}{4}$$

$$\frac{x+6+x}{x(x+6)} = \frac{1}{4}$$

$$x^2 - 2x - 24 = 0$$

$$(x-6)(x+4) = 0$$

$$x = 6 \quad [\text{neglecting the negative value of } x]$$

Q21. Option (A)

$$\text{Part filled by A in one hour} = \frac{1}{36}$$

$$\text{Part filled by B in 1 hour} = \frac{1}{45}$$

$$\text{Part filled by (A+B) in 1 hour} = \frac{1}{36} + \frac{1}{45} = \frac{1}{20}$$

Hence, both pipe together can fill the tank in 20 hrs.

Q22. Option (D)

Applying shortcut method,

Time taken to fill the tank if both pipes are

$$\text{opened simultaneously} = \frac{4 \times (-9)}{4 + (-9)} = 7.2$$

hours

Q23. Option (C)

Net part filled in 1 hour

$$= \left(\frac{1}{5} + \frac{1}{6} - \frac{1}{12}\right) = \frac{17}{60}$$

$$\text{Time taken to fill the tank} = \frac{60}{17} = 3\frac{9}{17}$$

hours

Q24. Option (E)

$$(A+B)'s \text{ 1 hour work} = \left(\frac{1}{12} + \frac{1}{15}\right) = \frac{9}{60}$$

$$(A+C)'s \text{ 1 hour work} = \left(\frac{1}{12} + \frac{1}{20}\right) = \frac{8}{60}$$

$$\text{Part filled in 2 hour} = \left(\frac{9}{60} + \frac{8}{60}\right) = \frac{17}{60}$$

$$\text{Part filled in 6 hours} = \left(3 \times \frac{17}{60}\right) = \frac{51}{60}$$

$$\text{Remaining part} = \frac{9}{60}$$

After 6 hours Now it is (A+B)'s turn

Time taken by the A+B to fill $\frac{9}{60}$ part = 1 hour

$$\text{Total time taken} = 6+1 = 7 \text{ hours}$$

Q25. Option (D)

$$\text{Work done by the leak in 1 hour} = \left(\frac{1}{2} - \frac{3}{7}\right) = \frac{1}{14}$$

Therefore, leak will empty the tank in 14 hours.

Q26. Option (B)

Let B be turned after x minutes.

Then, part filled by (A+B) in x minutes +

Part filled by A in $(30-x)$ minutes = 1

Therefore,

$$x \left(\frac{1}{37.5} + \frac{1}{45}\right) + (30-x) \frac{1}{37.5} = 1$$

$$x \left(\frac{2}{75} + \frac{1}{45}\right) + (30-x) \frac{2}{75} = 1$$

$$\frac{11x}{225} + \frac{60-2x}{75} = 1$$

$$11x + 180 - 6x = 225$$

$$x = 9$$

Q27. Option (C)

Suppose pipe A alone takes x hours to fill the tank

Then, pipes B and C will take $\frac{x}{2}$ and $\frac{x}{4}$ hours respectively to fill the tank.

Therefore, tank filled in 1 hour = $\frac{1}{x} + \frac{2}{x} +$

$$\frac{4}{x} = \frac{1}{5}$$

$$\frac{7}{x} = \frac{1}{5} \Rightarrow x = 35 \text{ hours}$$

Q28. Option (C)

Let the cistern be filled by pipe A alone in x hours.

Then, pipe B will fill it in $(x + 6)$ hours.

Tank filled in 1 hr

$$= \frac{1}{x} + \frac{1}{x+6} = \frac{1}{4}$$

$$\frac{2x+6}{x(x+6)} = \frac{1}{4}$$

$$8x + 24 = x^2 + 6x$$

$$x^2 - 2x - 24 = 0$$

$$(x-6)(x+4) = 0$$

$$x = 6, [\text{neglecting negative value}]$$

Q29. Option (C)

Let us assume first pipe alone takes x hours to fill the tank.

Then, second and third pipes will take $(x - 5)$ and $(x - 9)$ hours respectively to fill the tank.

Therefore,

$$\frac{1}{x} + \frac{1}{x-5} = \frac{1}{x-9}$$

$$(2x-5)(x-9) = x(x-5)$$

$$2x^2 - 23x + 45 = x^2 - 5x$$

$$x^2 - 18x + 45$$

$$(x-15)(x-3) = 0$$

$$x = 15 \text{ or } x = 3$$

As per options, $x = 15$ hours

Q30. Option (C)

Work done by the waste pipe in 1 minute =

$$\frac{1}{15} - \left(\frac{1}{20} + \frac{1}{24} \right) = -\frac{1}{40}$$

Volume of water in pumped out by waste pipe 1 minute = 3 gallon

Waste pipe can empty the tank in 40 min

Volume of water in pumped out by waste pipe 40 minute = $40 \times 3 = 120$ gallon

Q31. Option (A)

Let the filling capacity of tank be $x \text{ m}^3/\text{min}$

Then emptying capacity of the tank is $(x + 10) \text{ m}^3/\text{min}$

So,

$$\frac{2400}{x} - \frac{2400}{x+10} = 8$$

$$x^2 + 10x - 3000 = 0$$

Solving above eqn we get $x=50$ or $x=-60$, neglect -ve value.

$$x = 50$$

Q32. Option (C)

Part filled by (A+B+C) in 2 hours =

$$\frac{2}{6} = \frac{1}{3}$$

Let x be the

Part filled by A and B in 7 hours = $\frac{2}{3}$

Part filled by A and B in 1 hour = $\frac{2}{3 \times 7} = \frac{2}{21}$

So, A and B together can fill the tank in $\frac{21}{2}$

hours

So,

$$C \times \frac{21}{2} = 6$$

$$C + \frac{21}{2} = 6$$

$$\frac{21C}{2C+21} = 6$$

$$9C = 21 \times 6$$

$$C = 21 \times \frac{6}{9} = 14$$

Q33. Option (C)

Since P has thrice the capacity of Q, bucket Q will take $60 \times 3 = 180$ turns to fill the drum.

So, number of turns together required to fill the empty drum = $\frac{60 \times 180}{60 \times 180} = \frac{180}{1+3} = 45$

Q34. Option(B)

Part filled by A in 1 minute = $\frac{1}{20}$

Part filled by B in 1 minute = $\frac{1}{30}$

Part filled by (A+B) in 1 min = $\left(\frac{1}{20} + \frac{1}{30}\right) = \frac{1}{12}$

So both pipes can fill the tank in 12 mins.

Q35. Option (C)

Cistern filled in 1 hour = $\frac{1}{4}$

Empties in 1 hour = $\frac{1}{9}$

Net filled in 1 hour = $\frac{1}{4} - \frac{1}{9} = \frac{5}{36}$

So cistern will be filled in $\frac{36}{5}$ hours i.e. 7.2 hours

Q36. Option (D)

Half tank will be filled in 3 hours

Lets calculate remaining half,

Part filled by the four taps in 1 hour =

$$4 \times \left(\frac{1}{6}\right) = \frac{2}{3}$$

Remaining part after 1/2 filled = $1 - \frac{1}{2} = \frac{1}{2}$

$$\frac{2}{3} : \frac{1}{2} :: 1 : x$$

$$\Rightarrow x = \left(\frac{1}{2} \times 1 \times 32\right)$$

$$\Rightarrow x = \frac{3}{4} \text{ hour} = 45 \text{ mins}$$

Total time = 3 hours + 45 mins = 3 hours 45 mins

Q37. Option (A)

Part to emptied $\frac{2}{5}$

$$\text{Part emptied in 1 minute} = \frac{1}{6} - \frac{1}{10} = \frac{1}{15}$$

$$\Rightarrow \frac{1}{15} : \frac{2}{5} : 1 : x$$

$$\Rightarrow \frac{2}{5} \times 15 = 6 \text{ minutes}$$

Q38. Option (D)

Part filled by A in 1 hour = $\frac{1}{5}$

Part filled by B in 1 hour = $\frac{1}{10}$

Part filled by C in 1 hour = $\frac{1}{30}$

Part filled by (A+B+C) in 1 hour = $\frac{1}{5} + \frac{1}{10} + \frac{1}{30} = \frac{1}{3}$

So all pipes will fill the tank in 3 hours.

Q39. Option (B)

Time taken by tank to get completely filled

$$= \left(\frac{1}{5} + \frac{1}{6} - \frac{1}{12}\right) = \frac{17}{60} \text{ hours} = 3 \frac{9}{17} \text{ hours}$$

Q40. Option C

Work done by the inlet in 1 hour = $\frac{1}{6} - \frac{1}{8} = \frac{1}{24}$

Work done by inlet in 1 min = $\frac{1}{24} \times \frac{1}{60} = \frac{1}{1440}$

Volume of 1/1440 part = 4 litres

Volume of whole = (1440×4) litres = 5760 litres

Q41. Option (D)

Work done for 1 hour without leak = $1/3$

Work done with leak = $3 \frac{1}{2} = \frac{7}{2}$

Work done with leak in 1 hour = $\frac{2}{7}$

Work done by leak in 1 hour = $\frac{1}{3} - \frac{2}{7} = \frac{1}{21}$

So tank will be empty by the leak in 21 hours.

Q42. Option (C)

Part filled by Tap A in 1 min = $\frac{1}{20}$

Part filled by Tap B in 1 min = $\frac{1}{60}$

(A+B)'s 10 minutes work = $10 \times$

$$\left(\frac{1}{20} + \frac{1}{60}\right) = 10 \times \frac{4}{60} = \frac{2}{3}$$

$$\text{Remaining work} = 1 - \frac{2}{3} = \frac{1}{3}$$

$$\frac{1}{60} \text{ part filled by B in } = 1 \text{ min}$$

$$\frac{1}{3} \text{ part will be filled in } = \frac{\frac{1}{3}}{\frac{1}{60}} = \frac{60}{3} = 20$$

Q43. Option (C)

$$\text{Part filled without leak in 1 hour} = \frac{1}{9}$$

$$\text{Part filled with leak in 1 hour} = \frac{1}{10}$$

Work done by leak in 1 hour

$$= \frac{1}{9} - \frac{1}{10} = \frac{1}{90}$$

We used subtraction as it is getting empty.

So total time to empty the cistern is 90 hours

Q44. Option (A)

$$\text{Part filled in 3 minutes} = 3 \times \left(\frac{1}{12} + \frac{1}{15}\right) =$$

$$3 \times \frac{9}{60} = \frac{9}{20}$$

$$\text{Remaining part} = 1 - \frac{9}{20} = \frac{11}{20}$$

$$\Rightarrow \frac{1}{15} : \frac{11}{20} = 1 : x$$

$$\Rightarrow x = \frac{11}{20} \times 15$$

$$\Rightarrow x = 8.25 \text{ minutes}$$

So it will take further 8 mins 15 seconds to fill the bucket.

Q45. Option (B)

As per question, we get

$$\frac{1}{x} + \frac{1}{x-5} = \frac{1}{x-9}$$

$$\Rightarrow \frac{x-5+x}{x(x-5)} = \frac{1}{x-9}$$

$$\Rightarrow (2x-5)(x-9) = x(x-5)$$

$$\Rightarrow x^2 - 18x + 45 = 0$$

After solving this equation, we get

$$(x-15)(x+3) = 0,$$

As value cannot be negative, so $x = 15$

Q46. Option (A)

Let the slower pipe alone fill the tank in x minutes

then faster will fill in $x/3$ minutes.

Part filled by slower pipe in 1 minute = $1/x$

Part filled by faster pipe in 1 minute = $3/x$

Part filled by both in 1 minute =

$$\frac{1}{x} + \frac{3}{x} = \frac{1}{36}$$

$$\Rightarrow \frac{4}{x} = \frac{1}{36}$$

$$\Rightarrow x = 36 \times 4 = 144 \text{ minutes}$$

Q47. Option (C)

Capacity of the tank = $(12 \times 13.5) = 162$ litres

Capacity of each bucket = 9 litres.

So we can get answer by dividing total capacity of tank by total capacity of bucket.

Number of buckets needed = $\frac{162}{9} = 18$ buckets

Q48. Option (D)

Let the total time be x mins.

Part filled in first half means in $\frac{x}{2} = \frac{1}{40}$

Part filled in second half means in $\frac{x}{2} =$

$$\frac{1}{60} + \frac{1}{40} = \frac{1}{24}$$

$$\text{Total} = \frac{x}{2} \times \frac{1}{40} + \frac{x}{2} \times \frac{1}{24} = 1$$

$$\Rightarrow \frac{x}{2} \left(\frac{1}{40} + \frac{1}{24}\right) = 1$$

$$\Rightarrow \frac{x}{2} \times \frac{1}{15} = 1$$

$$\Rightarrow x = 30 \text{ minutes}$$

Q49. Option (B)

(A+B)'s 2 hour's work when opened =

$$\frac{1}{6} + \frac{1}{4} = \frac{5}{12}$$

$$(A+B)'s 4 hour's work = \frac{5}{12} \times 2 = \frac{5}{6}$$

$$\text{Remaining work} = 1 - \frac{5}{6} = \frac{1}{6}$$

Now, it's a turn in 5th hour

$\frac{1}{6}$ work will be done by A in 1 hour

$$\text{Total time} = 4 + 1 = 5 \text{ hours}$$

Q50. Option (A)

Lets suppose tank got filled by first pipe in x hours,

So, second pipe will fill the tank in $x + 10$ hours.

$$\Rightarrow \frac{1}{x} + \frac{1}{x+10} = \frac{1}{12}$$

$$\Rightarrow x = 20$$

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Pipes & Cistern Questions

A Tank is filled with the mixture of Milk and Water in the ratio of 3:2 up to $\frac{2}{5}$ of its capacity. The tank has two inlet pipes i.e., Milk and Water inlets. Milk and Water pipe can fill an empty tank in 12 and 18 hours respectively. Now both pipes are opened simultaneously and closed after the Tank is completely filled, then what is the ratio of Milk and Water in the full Tank if it can accommodate 250 Litre?

- A. 1:1
- B. 2:3
- C. 3:2
- D. 5:4
- E. None

Answer – C. 3:2

Explanation :

Initial Milk = $\frac{2}{5} \times 250 \times \frac{3}{5} = 60 \text{ L}$

Water = $\frac{2}{5} \times 250 \times \frac{2}{5} = 40 \text{ L}$

Rest of Tank = 150 L

Pipes are opened then can fill rest of tank in $\frac{108}{25}$ hours

H/W = constant

then $(\frac{108}{25})/12/x = (\frac{108}{25})/18(150-x)$

$X = 90 = \text{Milk, Water} = 60$

Final ratio = 3:2

☐ **An Inlet pipe can fill a tank in 5 hours and an Outlet pipe can empty $\frac{4}{7}$ of the same Tank in 4 hours. In the first hour only Inlet pipe is opened and in the second hour, only outlet pipe is opened. They have opened alternately every hour until the Tank is filled. Then in how many hours does the Tank gets filled?**

- A. 17 Hours 17 Min
- B. 34 Hours $\frac{60}{7}$ Min
- C. 35 Hours 15 Min
- D. 36 Hours $\frac{60}{7}$ Min
- E. None

Answer – B. 34 Hours $\frac{60}{7}$ Min

Explanation :

2 hours work = $\frac{1}{5} - \frac{1}{7} = \frac{2}{35}$

34 hours work = $\frac{34}{35}$

remaining work = $\frac{1}{35}$

Now its inlet pipe turn = $\frac{1}{35} \times 5 = \frac{1}{7}$
= 34 hours + $\frac{60}{7}$ min

☐ **A Tank is already filled up to X% of its capacity. An Inlet pipe can fill Full Tank in 30 minutes and an Outlet pipe can empty Full Tank in 20 Minutes. Now both pipes are opened then the Tank is emptied in 24 Minutes. Then initially up to what % of its capacity is Tank filled?**

- A. 40%
- B. 48%
- C. 50%
- D. 60%
- E. Cannot be determined

Answer – A. 40%

Explanation :

$\frac{1}{30} - \frac{1}{20} = -\frac{1}{60}$

Full Tank can be emptied 60 Minutes

In 24 minutes 40% of Tank can be emptied.

☐ **Two Inlet Pipes A and B together can fill a Tank in 'X' minutes. If A and B take 81 minutes and 49 minutes more than 'X' minutes respectively, to fill the Tank. Then They can fill the $\frac{5}{7}$ of that Tank in how many minutes?**

- A. 45 Minutes
- B. 49 Minutes
- C. 63 Minutes
- D. 81 Minutes
- E. None

Answer – A. 45 Minutes

Explanation :

Time taken by two pipes to fill full Tank is = \sqrt{ab}
min = 63 min

$\frac{5}{7}$ Tank = $63 \times \frac{5}{7} = 45 \text{ min}$

☐ **Pipe A can fill a Tank in 18 Hours, Pipe B can empty a Tank in 12 Hours, Pipe C can fill Tank in 6 Hours. The Tank is already filled up to $\frac{1}{6}$ of its capacity. Now Pipe A is opened in the First Hour alone, Pipe B is opened in the Second Hour alone and Pipe C is opened in the Third Hour alone. This cycle is repeated until the Tank gets filled. Then in How many Hours does the rest of Tank gets filled?**

- A. 15 Hours
- B. 18 Hours
- C. 20 Hours
- D. 24 Hours
- E. None

Answer – B. 18 Hours

Explanation :

In First Hour Tank filled = $1/6 + 1/18$

Second Hour = $1/6 + 1/18 - 1/12$

Third Hour = $1/6 + 1/18 - 1/12 + 1/6 = 11/36$ is filled

$25/36$ is left

From then 3 hours work = $1/18 - 1/12 + 1/6 = 5/36$

$5 * 3$ Hours = $5 * 5/36 = 25/36$

Total = $5 * 3 + 3 = 18$ Hours

□ If the ratio of Rate of filling of two Pipes A and B is 3:2. If together they can fill a Tank $5/6$ th of Tank in 20 minutes. Then in how many does A alone can fill the Tank?

- A. 20 Minutes
- B. 30 Minutes
- C. 40 Minutes
- D. 50 Minutes
- E. 60 Minutes

Answer – C. 40 Minutes

Explanation :

$5/6$ tank = 20 Min

Full tank = 24 Min

$1/2x + 1/3x = 1/24$

$x = 20$, A = $2x = 40$ Min

□ Pipe A, B and can fill a Full Tank in 24,36 and 48 Minutes respectively. All three Pipes are Opened simultaneously in a Tank which is already filled up to $1/6$ of its capacity. A and B are opened for only First 6 Minutes and closed thereafter. Then C alone filled remaining Tank. Then in total how many Minutes does C filled the Tank?

- A. 12 Minutes
- B. 14 Minutes
- C. 16 Minutes
- D. 18 Minutes
- E. 20 Minutes

Answer – E. 20 Minutes

Explanation :

$$6 * (1/24 + 1/36 + 1/48) + x/48 = 5/6$$

$$x = 14 \text{ Min}$$

$$C = 6 + 14 = 20$$

□ Pipe A and B can fill a Tank alone in 12 Hours and 6 Hours respectively. Another Pipe C can empty the same Tank alone in 9 Hours. In an empty Tank for the First hour, Pipe A is opened alone, Second Hour pipe B is opened alone, Third Hour pipe C is opened alone. This process is continued until the Tank is filled. Then Pipe A is opened for How many Hours?

- A. 7 Hours
- B. 7 Hours 10 Min
- C. 7 Hours 15 Min
- D. 7 Hours 20 Min
- E. None

Answer – D. 7 Hours 20 Min

Explanation :

$$3 \text{ hours work} = 1/12 + 1/6 - 1/9 = 5/36$$

$$7 * 3 \text{ hours work} = 35/36$$

$$\text{remaining work} = 1/36$$

$$\text{Now its pipe A turn} = 1/36 * 12 = 1/3 \text{ hour}$$

$$\text{Total} = 7 \text{ hours} + 20 \text{ min}$$

□ Pipe A and B can fill a Tank alone in 48 Hours and 24 Hours respectively. Another Pipe C can empty the same Tank alone in 36 Hours. In an empty Tank for the First hour, Pipe A is opened alone, Second Hour pipe B is opened alone, Third Hour pipe C is opened alone. This process is continued until the Tank is filled. Then Pipe B is opened for How many Hours?

- A. 28 Hours
- B. 28 Hours 10 Min
- C. 29 Hours
- D. 29 Hours 10 Min
- E. None

Answer – B. 28 Hours 10 Min

Explanation :

$$3 \text{ Hours work} = (1/48 + 1/24 - 1/36) = 5/144$$

$$28 * 3 \text{ hours} = 140/144$$

$$\text{remaining part} = 4/144 = 1/36$$

$$\text{Now it's A turn} = 1/36 - 1/48$$

$$= 1/144 \text{ left}$$

$$\text{Now it's B turn} = 1/144 * 24 = 1/6 \text{ hour} = 10 \text{ min}$$

$$\text{Total B} = 28 \text{ Hours} + 10 \text{ Min}$$

□ **Two Pipes A and B together can fill a Tank in 'X' minutes. If 'A' is Inlet Pipe can Fill the Tank alone in 40 minutes less than 'X' minutes and 'B' is Outlet pipe can empty the Tank alone in 30 minutes less than 'X' minutes. Then together they can fill the empty Tank in how many minutes?**

- A. 48 Minutes
- B. 54 Minutes
- C. 60 Minutes
- D. 70 Minutes
- E. None

Answer – C. 60 Minutes

Explanation :

$$\frac{1}{x-40} - \frac{1}{x-30} = \frac{1}{x}$$

$$x = 60 \text{ min}$$

□

A Special pump can be used for filling as well as for emptying a Cistern. The capacity of the Cistern is 2400m³. The emptying capacity of the Cistern is 10m³ per minute higher than its filling capacity and the pump needs 8 minutes lesser to Cistern the tank than it needs to fill it. What is the filling capacity of the pump?

- A. 40m³/min
- B. 50m³/min
- C. 60m³/min
- D. 30m³/min
- E. None of the Above

Answer – B. 50m³/min

Explanation :

Filling Capacity of the Pump = x m/min

Emptying Capacity of the pump = $(x+10)$ m/min

$$\frac{2400}{x} - \frac{2400}{x+10} = 8$$

$$(x-50) + (x+60) = 0$$

$$x = 50$$

□ **Three pipes P, Q and R can fill a Cistern in 6 hours. After working at it together for 2 hours, R is closed and P and Q can fill the remaining part in 7 hours. The number of hours taken by R alone to fill the Cistern is**

- A. 14 hours
- B. 12 hours
- C. 15 hours
- D. 18 hours
- E. None of the Above

Answer – A. 14 hours

Explanation :

$$\text{Part filled in 2 hours} = \frac{2}{6} = \frac{1}{3}$$

$$\text{Remaining Part} = (1 - \frac{1}{3}) = \frac{2}{3}$$

$$(P + Q)'s \text{ 7 hour work} = \frac{2}{3}$$

$$(P + Q)'s \text{ 1 hour work} = \frac{2}{21}$$

$$R's \text{ 1 hour work} = (P + Q + R) \text{ 1 hour work} - (P + Q) \text{ 1 hour work}$$

$$= (\frac{1}{6} - \frac{2}{21}) = \frac{1}{14} = 14 \text{ hours}$$

□ **A Cistern is two-fifth full. Pipe A can fill a tank in 10 minutes and pipe B can empty it in 6 minutes. If both the pipes are open, how long will it take to empty or fill the tank completely?**

- A. 5 minutes
- B. 4 minutes
- C. 6 minutes
- D. 8 minutes
- E. None of the Above

Answer – C. 6 minutes

Explanation :

pipe B is faster than pipe A and so, the tank will be emptied.

$$\text{part to be emptied} = \frac{2}{5}$$

$$\text{part emptied by (A+B) in 1 minute} = (\frac{1}{6} - \frac{1}{10}) = \frac{1}{15}$$

$$\frac{1}{15} : \frac{2}{5} :: 1 : x$$

$$\frac{2}{5} * 15 = 6 \text{ minutes.}$$

□ **If a pipe A can fill a tank 3 times faster than pipe B. If both the pipes can fill the tank in 32 minutes, then the slower pipe alone will be able to fill the tank in?**

- A. 128 minutes
- B. 124 minutes
- C. 154 minutes
- D. 168 minutes
- E. None of the Above

Answer – A. 128 minutes

Explanation :

Time is taken by pipe A = x

Time is taken by pipe B = $\frac{x}{3}$

$$\frac{1}{x} + \frac{3}{x} = \frac{1}{32}$$

$$x = 128 \text{ minutes}$$

□ **A large cistern can be filled by two pipes P and Q in 15 minutes and 20 minutes respectively. How many minutes will it take to fill the Cistern from an empty state if Q is used**

for half the time and P and Q fill it together for the other half?

- A. 12 minutes
- B. 17 minutes
- C. 18 minutes
- D. 19 minutes
- E. None of the Above

Answer – A. 12 minutes

Explanation :

Part filled by P and Q = $1/15 + 1/20 = 7/60$

Part filled by Q = $1/20$

$x/2(7/60 + 1/20) = 12$ minutes

□ *A pipe can fill a cistern in 16 hours. After half the tank is filled, three more similar taps are opened. What is the total time taken to fill the cistern completely?*

- A. 3 hours
- B. 2 hours
- C. 9 hours
- D. 4 hours
- E. None of the Above

Answer – C. 9 hours

Explanation :

In One hour pipe can fill = $1/16$

Time is taken to fill half of the tank = $1/2 * 16 = 8$ hours

Part filled by four pipes in one hour = $(8 * 1/16) = 1/2$

Required Remaining Part = $1/2$

Total time = $8 + 1 = 9$

□ *Two pipes P and Q are opened together to fill a tank. Both the pipes fill the tank in time “x” If Q separately took 25 minutes more time than “x” to fill the tank and Q took 49 minutes more time than “x” to fill the tank, then find out the value of x?*

- A. 48 minutes
- B. 35 minutes
- C. 54 minutes
- D. 68 minutes
- E. None of the Above

Answer – B. 35 minutes

Explanation :

Time is taken to fill the tank by both Pipes $x = \sqrt{a*b}$

$x = \sqrt{25*49} = 5 * 7 = 35$

□ *Three taps P, Q and R can fill a tank in 12, 15 and 20 hours respectively. If P is open all the time and Q, R are open for one hour each alternatively, the tank will be full in*

- A. 3 hours
- B. 2 hours
- C. 7 hours
- D. 4 hours
- E. None of the Above

Answer – C. 7 hours

Explanation :

(P + Q)'s 1 hour work = $1/12 + 1/15 = 3/20$

(P + R)'s 1 hour work = $1/12 + 1/20 = 2/15$

For 2 hrs = $(3/20 + 2/15) = 17/60$

For 6 hrs = $(3 * 17/60) = 17/20$

Remaining Part = $1 - 17/20 = 3/20$ filled by P and Q in 1 hour

□ *Pipe A fills a tank in 30 minutes. Pipe B can fill the same tank 5 times as fast as pipe A. If both the pipes were kept open when the tank is empty, how much time will it take for the tank to overflow?*

- A. 3 minutes
- B. 2 minutes
- C. 5 minutes
- D. 4 minutes
- E. None of the Above

Answer – C. 5 minutes

Explanation :

Total Capacity = 90L.

Tank filled in 1 minute by A = 3L

Tank filled in 1 minute by B = 15L

The capacity of the tank filled with both A and B in 1 minute = 18L.

overflow = $90/18 = 5$ minutes.

□ *Two pipes P and Q can fill a cistern in 10 hours and 20 hours respectively. If they are opened simultaneously. Sometimes later, tap Q was closed, then it takes total 5 hours to fill up the whole tank. After how many hours Q was closed?*

- A. 14 hours
- B. 15 hours
- C. 10 hours
- D. 16 hours
- E. None of the Above

Answer – C. 10 hours

Explanation :

Pipe P Efficiency = $100/10 = 10\%$

Pipe Q Efficiency = $100/20 = 5\%$

Net Efficiency = 15%

$15x + 10(5-x) = 100$

$x = 10$

□

If a pipe A can fill a tank 3 times faster than pipe B and takes 32 minutes less than pipe B to fill the tank. If both the pipes are opened simultaneously, then find the time taken to fill the tank?

A. 14 minutes

B. 12 minutes

C. 15 minutes

D. 16 minutes

E. None of the Above

Answer – B. 12 minutes

Explanation :

$3x - x = 32$

$x = 16$

$1/16 + 1/48 = 4/48$

Time taken to fill the tank = $48/4 = 12$ minutes

□ **Two pipes P and Q can fill a tank in 24 minutes and 27 minutes respectively. If both the pipes are opened simultaneously, after how much time should B be closed so that the tank is full in 8 minutes?**

A. 14 minutes

B. 12 minutes

C. 15 minutes

D. 18 minutes

E. None of the Above

Answer – D. 18 minutes

Explanation :

Required time = $y(1-(t/x)) = 27(1-(8/24)) = 18$ minutes

□ **A full tank gets emptied in 8 minutes due to the presence of a leak in it. On opening a tap which can fill the tank at the rate of 9 L/min, the tank get emptied in 12 min. Find the capacity of a tank?**

A. 120 L

B. 240 L

C. 216 L

D. 224 L

E. None of the Above

Answer – C. 216 L

Explanation :

$a = 8; b = 9; C = 12$

Capacity of a tank = $a*b*c/c-a = 8*9*12/4 = 216$ Litre.

□ **If a pipe A can fill a tank 3 times faster than pipe B. If both the pipes can fill the tank in 42 minutes, then the slower pipe alone will be able to fill the tank in?**

A. 148 minutes

B. 124 minutes

C. 154 minutes

D. 168 minutes

E. None of the Above

Answer – D. 168 minutes

Explanation :

Time is taken by pipe A = x

Time is taken by pipe B = $x/3$

$1/x + 3/x = 1/42$

$x = 168$ minutes

□ **A large cistern can be filled by two pipes P and Q in 15 minutes and 10 minutes respectively. How many minutes will it take to fill the Cistern from an empty state if Q is used for half the time and P and Q fill it together for the other half?**

A. 6.5 minutes

B. 7.5 minutes

C. 8.5 minutes

D. 9.5 minutes

E. None of the Above

Answer – B. 7.5 minutes

Explanation :

Part filled by P and Q = $1/15 + 1/10 = 1/6$

Part filled by Q = $1/10$

$x/2(1/6 + 1/10) = 2/15 = 15/2 = 7.5$ minutes

□ **A pipe can fill a cistern in 8 hours. After half the tank is filled, three more similar taps are opened. What is the total time taken to fill the cistern completely?**

A. 3 hours

B. 2 hours

C. 5 hours

- D. 4 hours
E. None of the Above

Answer – C. 5 hours

Explanation :

In One hour pipe can fill = $1/8$

Time is taken to fill half of the tank = $1/2 * 8 = 4$ hours

Part filled by four pipes in one hour = $(4 * 1/8) = 1/2$

Required Remaining Part = $1/2$

Total time = $4 + 1 = 5$

☐ Two pipes P and Q are opened together to fill a tank. Both the pipes fill the tank in time “x” If Q separately took 16 minutes more time than “x” to fill the tank and Q took 36 minutes more time than “x” to fill the tank, then find out the value of x?

- A. 48 minutes
B. 24 minutes
C. 54 minutes
D. 68 minutes
E. None of the Above

Answer – B. 24 minutes

Explanation :

Time is taken to fill the tank by both Pipes x
= $\sqrt{a*b}$

$x = \sqrt{16*36} = 4 * 6 = 24$

☐ A Cistern has an inlet pipe and outlet pipe. The inlet pipe fills the cistern completely in 1 hour 20 minutes when the outlet pipe is plugged. The outlet pipe empties the tank completely in 6 hours when the inlet pipe is plugged. If there is a leakage also which is capable of draining out the water from the tank at half of the rate of the outlet pipe, then what is the time taken to fill the empty tank when both the pipes are opened?

- A. 3 hours
B. 2 hours
C. 5 hours
D. 4 hours
E. None of the Above

Answer – B. 2 hours

Explanation :

Inlet pipe Efficiency = $100/(8/6) = 75\%$

Outlet pipe Efficiency = $100/(6) = 16.66\%$

Efficiency of leakage = half of the rate of the outlet pipe = 8.33%

Net Efficiency = $75 - (16.66 + 8.33) = 50\%$

Required time = $100/50 = 2$ hours

☐ A Cistern has an inlet pipe and outlet pipe. The inlet pipe fills the cistern completely in 1 hour 20 minutes when the outlet pipe is plugged. The outlet pipe empties the tank completely in 4 hours when the inlet pipe is plugged. If both pipes are opened simultaneously at a time when the tank was one-third filled, when will the tank fill thereafter?

- A. 3 hours
B. 2 hours
C. 5 hours
D. 4 hours
E. None of the Above

Answer – B. 2 hours

Explanation :

Inlet pipe Efficiency = $100/(8/6) = 75\%$

Outlet pipe Efficiency = $100/(4) = 25\%$

Net Efficiency = $75 - 25 = 50\%$ (1/3) filled

$2/3$ filled = 100%

Required time = $100/50 = 2$ hours

☐ Two pipes P and Q can fill a cistern in 10 hours and 20 hours respectively. If they are opened simultaneously. Sometimes later, tap Q was closed, then it takes total 8 hours to fill up the whole tank. After how many hours Q was closed?

- A. 4 hours
B. 5 hours
C. 2 hours
D. 6 hours
E. None of the Above

Answer – A. 4 hours

Explanation :

Pipe P Efficiency = $100/10 = 10\%$

Pipe Q Efficiency = $100/20 = 5\%$

Net Efficiency = 15%

$15x + 10(8-x) = 100$

$x = 4$

☐ Three pipes A, B, and C can fill the tank in 10 hours, 20 hours and 40 hours respectively. In

the beginning all of them are opened simultaneously. After 2 hours, tap C is closed and A and B are kept running. After the 4th hour, tap B is also closed. The remaining work is done by tap A alone. What is the percentage of the work done by tap A alone?

- A. 30 %
- B. 35 %
- C. 45 %
- D. 50 %
- E. None of the Above

Answer – B. 35 %

Explanation :

Pipe A's work in % = $100/10 = 10\%$

Pipe B's work in % = $100/20 = 5\%$

Pipe C's work in % = $100/40 = 2.5\%$

All of them are opened for 2 hours + after 2 hours, tap C is closed + After the 4th hour, tap B is also closed = 100

$\Rightarrow (10+5+2.5)*2 + (10+5)*2 + X = 100$

$\Rightarrow 35 + 30 + \text{work by tap A alone} = 100$

$\Rightarrow \text{work by tap A alone} = 100-65 = 35\%$

☐ *A pipe can fill a tank in 12 minutes and another pipe can fill it in 15 minutes, but a third pipe can empty it in 6 minutes. The first two pipes are kept open for 5 min in the beginning and then third pipe is also opened. Time taken to empty the water tank is?*

- A. 30 mins
- B. 25 mins
- C. 45 mins
- D. 50 mins
- E. None of the Above

Answer – C. 45 mins

Explanation :

$x/6 - (x+5)/12 - (x+5)/15 = 0$

$x = 45 \text{ mins}$

☐ *Two pipes A and B can fill a tank in 12 hours and 18 hours respectively. The pipes are opened simultaneously and it is found that due to leakage in the bottom of the tank it took 48 minutes excess time to fill the cistern. When the cistern is full, in what time will the leak empty it?*

- A. 72 hours
- B. 62 hours
- C. 64 hours

- D. 84 hours
- E. None of the Above

Answer – A. 72 hours

Explanation :

Work done by the two pipes in 1 hour = $(1/12)+(1/18) = (15/108)$.

Time taken by these pipes to fill the tank = $(108/15)\text{hrs} = 7 \text{ hours } 12 \text{ min.}$

Due to leakage, time taken = 7 hours 12 min + 48 min = 8 hours

Work done by two pipes and leak in 1 hour = $1/8$.

Work done by the leak in 1 hour = $(15/108)-(1/8)=(1/72)$.

Leak will empty the full cistern in 72 hours.

☐ *A tank is normally filled in 6 hours but takes two hours longer to fill because of a leak in the bottom of the tank. If the tank is full the leak will empty it in how many hours?*

- A. 16 hours
- B. 18 hours
- C. 17 hours
- D. 24 hours
- E. None of the Above

Answer – D. 24 hours

Explanation :

Work done by leak in 1 hr = $(1/6-1/8)=1/24$

Leak will empty the tank in 24 hours

☐ *Twelve pipes are connected to a Cistern. Some of them are inlet pipes and the others are outlet pipes. Each of the inlet pipes can fill the tank in 8 hours and each of the outlet pipes can empty the cistern completely in 6 hours. If all the pipes are kept open, the empty tank gets filled in 24 hours. How many inlet pipes are there?*

- A. 6
- B. 8
- C. 7
- D. 4
- E. None of the Above

Answer – C. 7

Explanation :

$(x/8)-[(12-x)/6] = 1/24$

$x = 7$

□ A dam has four inlets – A, B, C and D. The dam can be filled in 12 minutes through the first three inlets and it can be filled in 15 minutes through the second, the third and fourth inlet also it can be filled through the first and the fourth inlet in 20 minutes. How much time required to fill up the dam by all the four inlets?

- A. 10 mins
- B. 15 mins
- C. 20 mins
- D. 25 mins
- E. None of the Above

Answer – A. 10 mins

Explanation :

$$(1/A + 1/B + 1/C) = 1/12 \dots(i)$$

$$(1/B + 1/C + 1/D) = 1/15 \dots(ii)$$

$$(1/A + 1/D) = 1/20 \dots(iii)$$

From eqn (i) and (ii)

$$(1/A - 1/D) = 1/60 \dots(iv)$$

From eqn (iii) and (iv)

$$A=30 \ D=60.$$

Let the time taken to full the tank = T

$$T(1/A + 1/B + 1/C + 1/D) = 1$$

$$T(1/30 + 1/15) = 1$$

$$T = 10 \text{ mins}$$

□ Three pipes P, Q and R connected to a Cistern. The first pipe (i.e) P can fill 1/2 part of the tank in one hour, second pipe, Q can fill 1/3 part of the cistern in one hour. R is connected to empty the cistern. After opening all the three pipes 7/12 part of the cistern. Then how much time required to empty the cistern completely?

- A. 2 hours
- B. 3 hours
- C. 4 hours
- D. 5 hours
- E. None of the Above

Answer – C. 4 hours

Explanation :

In 1 hour, P can fill = 1/2 Part

Time taken to fill the Cistern by Pipe P = 2 hours

In 1 hour, Q can fill = 1/3 Part

Time taken to fill the Cistern by Pipe P = 3 hours

$$[1/2 + 1/3 - 1/R] = 7/12$$

$$1/R = 1/4$$

Time required to empty the Cistern = 4 hours

□ A Cistern can be filled by an inlet pipe at the rate of 4 litres per minute. A leak in the bottom of a cistern can empty the full tank in 8 hours. When the cistern is full, the inlet is opened and due to the leak, the cistern is empty in 40 hours. How many litres does the cistern hold?

- A. 4000 litre
- B. 2400 litre
- C. 1920 litre
- D. 2020 litre
- E. None of the Above

Answer – B. 2400 litre

Explanation :

Part emptied by the leak in 1 hour = 1/8

part filled by (leak & inlet open) in 1 hour = 1/40

Part filled by the inlet pipe in 1 hour = 1/8 – 1/40 = 1/10

Inlet pipe fills the tank in = 10 hours

Inlet pipe fills water at the rate of 4 litres a minute.

$$\text{Capacity of Cistern} = 10 * 60 * 4 = 2400 \text{ litre}$$

□ In a tank there is a pipe which can be used for filling the tank as well as for emptying it. The capacity of the tank is 1200 m³. The emptying of the tank is 10 m³ per minute higher than its filling capacity and the pump needs 6 minutes lesser to empty the tank than it needs to fill it. What is the filling capacity of the pipe?

- A. 20 m³ / min.
- B. 40 m³ / min.
- C. 50 m³ / min.
- D. 60 m³ / min.
- E. None of the Above

Answer – B. 40 m³ / min.

Explanation :

$$1200/x - 1200/(x+10) = 6$$

$$200/x - 200/(x+10) = 6$$

$$x^2 + 10x - 2000 = 0$$

$$x = 40$$

□ Two pipes P and Q can fill a cistern in 12 hours and 4 hours respectively. If they are opened on alternate hours and if pipe A is

opened first, in how many hours will the tank be full?

- A. 4 hours
- B. 5 hours
- C. 2 hours
- D. 6 hours
- E. None of the Above

Answer – D. 6 hours

Explanation :

Pipe P can fill = $1/12$

Pipe Q can fill = $1/4$

For every two hour, $1/12 + 1/4 = 1/3$ Part filled

Total = 6 hours

□

Two pipes A and B can fill a tank in 10 hours and 15 hours respectively while a third pipe C can empty the full tank in 20 hours. All the pipes are opened for 5 hours and then C is closed. Find the time in which the tank is full?

- a) 5.5 hrs
- b) 6.5 hrs
- c) 7.5 hrs
- d) 8.5 hrs
- e) None of these

Answer – c) 7.5 hrs

Explanation :

$(1/10 + 1/15 - 1/20) * 5 + (1/10 + 1/15) * T = 1$.

We will get $T = 2.5$ hrs

so total time = $5 + 2.5 = 7.5$ hrs

□ **Three pipe P, Q and R can fill a tank in 12 minutes, 18 minutes and 24 minutes respectively. The pipe R is closed 12 minutes before the tank is filled. In what time the tank is full?**

- a) $8.(5/13)$ hrs
- b) $8.(4/13)$ hrs
- c) $7.(4/13)$ hrs
- d) $8.(6/13)$ hrs
- e) None of these

Answer – b) $8.(4/13)$ hrs

Explanation :

Let T is the time taken by the pipes to fill the tank

$(1/12 + 1/18 + 1/24) * (T - 12) + (1/12 + 1/18) * 12 = 1$

We will get $T = 108/13 = 8.(4/13)$ hrs

□ **On pipe P is 4 times faster than pipe Q and takes 45 minutes less than pipe Q. In what time the cistern is full if both the pipes are opened together?**

- a) 8 minutes
- b) 10 minutes
- c) 12 minutes
- d) 14 minutes
- e) None of these

Answer – c) 12 minutes

Explanation :

Let P takes x minutes to fill the tank alone, then Q will take 4x minutes to fill the tank

$4x - x = 45$, $x = 15$

So P will take 15 minutes and Q will take 60 minutes to fill the tank. Both will fill the tank in $(60 * 15) / (75) = 12$ minutes

□ **Two pipes can fill a tank in 15 and 20 hours respectively. The pipes are opened simultaneously and it is found that due to the leakage in the bottom, 17/7 hours extra are taken extra to fill the tank. If the tank is full, in what approximate time would the leak empty it?**

- a) 27 hrs
- b) 32 hrs
- c) 36 hrs
- d) 39 hrs
- e) None of these

Answer – d) 39 hrs

Explanation :

Total time taken by both pipes before the leak was developed = $60/7$ hours

now, leaks is developed which will take T time to empty the tank so, $(1/15 + 1/20 - 1/T) = 1/11$ solve for T, we will get $660/17$ hours = 39 hours (approx.)

□ **Two pipes A and B can fill a tank in 8 minutes and 12 minutes respectively. If both the pipes are opened simultaneously, after what time should B be closed so that the tank is full in 6 minutes?**

- a) 1 min
- b) 2 min
- c) 3 min
- d) 4 min
- e) None of these

Answer – c) 3 min

Explanation :

Let after x minutes pipe B is closed

$$(1/8 + 1/12) * x + (1/8) * (6 - x) = 1$$

$X = 3$ minutes

□ In what time would a cistern be filled by three pipes whose diameters are 1cm, 2 cm and 3 cm running together, when the largest pipe alone can fill the tank in 21 minutes? The amount of water flowing through the pipe is directly proportional to the square of its diameter.

a) 10.5 minutes

b) 11.5 minutes

c) 12.5 minutes

d) 13.5 minutes

e) None of these

Answer – d) 13.5 minutes

Explanation :

More the diameter more will be the water flowing through it and less will be the time taken.

Means bigger pipe will take less time to fill the tank

So, for 1 cm time, $(1^2)/(3^2) = 21/t$, we get $t = 189$

For 2 cm time, $(2^2)/(3^2) = 21/t$. We get $t = 189/4$

So total time = $1/21 + 1/189 + 4/189 = 2/27$

So total time = 13.5 minutes

□ Two pipes P and Q can fill a tank in 10 min and 12 min respectively and a waste pipe can carry off 12 litres of water per minute. If all the pipes are opened when the tank is full and it takes one hour to empty the tank. Find the capacity of the tank.

a) 30

b) 45

c) 60

d) 75

e) None of these

Answer – c) 60

Explanation :

Let the waste pipe take 'T' time to empty the tank.

$$(1/10 + 1/12 - 1/T) * 60 = -1$$

We will get $T = 5$ min

So capacity = $5 * 12 = 60$ ltr

□ One pipe fill $1/4$ of the tank in 4 minutes and another pipe fills $1/5$ of the tank in 4 minutes. Find the time taken by both pipe together to fill half the tank?

a) 40/9 minutes

b) 50/9 minutes

c) 44/9 minutes

d) 53/9 minutes

e) None of these

□ Two pipes can separately fill the tank in 15hrs and 30hrs respectively. Both the pipe are opened and when the tank is $1/3$ full a leak is developed due to which $1/3$ water supplied by the pipe leaks out. What is the total time to fill the tank?

a) 20/3 hr

b) 35/3 hr

c) 40/3 hr

d) 50/3 hr

e) None of these

Answer – c) 40/3 hr

Explanation :

$$(1/15 + 1/30) * T_1 = 1/3, T_1 = 10/3 \text{ hr}$$

$$\text{Now after leak is developed, } [(1/15 + 1/30) - (1/3) * (1/15 + 1/30)] * T_2 = 2/3$$

$$T_2 = 10 \text{ hr. So total time} = 10 + 10/3 = 40/3 \text{ hr}$$

□ Three pipes A, B and C is attached to a cistern. A can fill it in 20 minutes and B can fill it in 30 minutes. C is a waste pipe. After opening both the pipes A and B, Riya leaves the cistern to fill and returns when the cistern is supposed to be filled. But she found that waste pipe C had been left open, she closes it and now the cistern takes 5 minutes more to fill. In how much time the pipe C can empty the full cistern?

a) 26.8 minutes

b) 25.8 minutes

c) 27.8 minutes

- d) 28.8 minutes
e) None of these

Answer – d) 28.8 minutes

Explanation :

The tank supposed to be filled in $(30 \times 20)/50 = 12$ minutes

so, $(1/20 + 1/30) \times 12 - 12/C + (1/20 + 1/30) \times 5 = 1$ (A and B work for 12 minutes and also C work for 12 minutes and then A and B takes 5 more minutes to fill the tank)

solve for C, we will get $C = 144/5 = 28.8$

□

A pipe can empty a tank in 60 minutes alone. Another pipe whose diameter is twice the diameter of first pipe is also opened. Now find the time in which both pipe will empty the tank together.

- a) 8 min
b) 10 min
c) 12 min
d) 14 min
e) None of these

Answer – c) 12 min

Explanation :

Time taken by pipe to empty the tank is inversely proportional to cross-sectional area.

So, time taken by second pipe will be $= 60/4 = 15$ min ($\pi r^2 = 1/60$ and for second pipe $4\pi r^2 = 1/T$ so we get $T = 15$ min)

Time taken by both to empty the pipe $= (60 \times 15)/75 = 12$

□ **Two pipes P and Q can fill a tank in 10 min and 12 min respectively and a waste pipe can carry off 12 litres of water per minute. If all the pipes are opened when the tank is full and it takes one hour to empty the tank. Find the capacity of the tank.**

- a) 30
b) 45
c) 60
d) 75
e) None of these

Answer – c) 60

Explanation :

Let the waste pipe take 'T' time to empty the tank.

$$(1/10 + 1/12 - 1/T) \times 60 = -1$$

We will get $T = 5$ min

So capacity $= 5 \times 12 = 60$ ltr

□ **Two pipes P and Q can fill a tank in 36 and 24 minutes respectively. If both the pipes are opened simultaneously, after how much time pipe Q should be closed so that tank is full in 30 minutes.**

- a) 2min
b) 4min
c) 6min
d) 8min
e) None of these

Answer – b) 4min

Explanation :

Let after T time, Q is closed, $(1/36 + 1/24) \times T + (1/36) \times (30 - T) = 1$

□ **Two pipes A and B can fill a tank in 20 and 30 minutes respectively. Both the pipes are opened together but after 5 minutes pipe B is closed. What is the total time required to fill the tank**

- a) 16.1/3 min
b) 16.2/3 min
c) 17.2/3 min
d) 18.2/3 min
e) None of these

Answer – b) 16.2/3 min

Explanation :

$$(1/20 + 1/30) \times 5 + (1/20) \times T = 1$$

total time $= T + 5$ min

□ **Three pipes P, Q and R can fill a tank in 12, 15 and 20 minutes respectively. If pipe P is opened all the time and pipe Q and R are opened for one hour alternatively. The tank will be full in**

- a) 5hr
b) 6hr
c) 7hr
d) 8hr
e) None of these

Answer – c) 7hr

Explanation :

$(1/12 + 1/15) + (1/12 + 1/20) = 17/60$ (in 2 hrs this much tank is filled)

so in 6 hrs $51/60$ is filled. Remaining, $9/60 = (1/12 + 1/15)*t$, so $T = 1\text{hr}$
 so total = $6 + 1 = 7\text{ hr}$

☐ A cistern can be filled by a pipe in 6 hours. A leak is developed at the bottom due to which it takes 2 hours more to fill the cistern. Find the time taken by the leak to empty the cistern when the cistern is full.

- a) 20hr
- b) 22hr
- c) 24hr
- d) 26hr
- e) None of these

Answer – c) 24hr

Explanation :

$1/6 - 1/T = 1/8$, solve for T

☐ A pipe can fill a tank in 20 minutes and another pipe can fill the tank in 40 minutes. There is a waste pipe which can empty the tank in 15 minutes. First two pipes are opened for 5 minutes and then the third pipe is also opened. In what time the cistern is emptied after the third pipe also opened

- a) 60
- b) 75
- c) 80
- d) 90
- e) None of these

Answer – b) 75

Explanation :

$(1/20 + 1/40)*5 + (1/20 + 1/40 - 1/15)*T = 1$

☐ Two pipes can separately fill the tank in 15hrs and 30hrs respectively. Both the pipe are opened and when the tank is $1/3$ full a leak is developed due to which $1/3$ water supplied by the pipe leaks out. What is the total time to fill the tank?

- a) $20/3\text{ hr}$
- b) $35/3\text{ hr}$
- c) $40/3\text{ hr}$
- d) $50/3\text{ hr}$
- e) None of these

Answer – c) $40/3\text{ hr}$

Explanation :

$(1/15 + 1/30)*T_1 = 1/3$, $T_1 = 10/3\text{ hr}$

now after leak is developed, $[(1/15 + 1/30) - (1/3)*(1/15 + 1/30)]*T_2 = 2/3$
 $T_2 = 10\text{ hr}$. So total time = $10 + 10/3 = 40/3\text{ hr}$

☐ Pipe P is 4 times as fast as Q in filling a tank. If P takes 20 minutes to fill a tank, then what is the time taken by both the pipe P and Q to fill the tank?

- a) 12
- b) 16
- c) 18
- d) 20
- e) None of these

Answer – b) 16

Explanation :

P takes 20 minutes and it is 4 times faster than Q, it means Q will take 80 minutes to fill the tank.

$(1/20 + 1/80)*t = 1$. We get $t = 16$

☐ In what time a cistern is filled by three pipes of diameter 2cm, 4cm and 6cm respectively. If the time taken by largest pipe to fill the tank is 40 minutes. Amount of water flowing through the pipe is proportional to the diameter of the pipe

- a) $25.5/7\text{ min}$
- b) $25.3/7\text{ min}$
- c) $23.5/7\text{ min}$
- d) $23.4/7\text{ min}$
- e) None of these

Answer – a) $25.5/7\text{ min}$

Explanation :

Larger the cross-section area less will be time taken by pipe to fill the tank.

$36/16 = T/40$, $T = 90\text{min}$ (for 4 cm pipe)

similarly for 2 cm pipe time taken will be = 360min

Total time = $(1/360 + 1/90 + 1/40) = 1/p$, so we get $P = 25.5/7\text{ minutes}$

☐ Two pipes P and Q can fill a tank in 20hrs and 25hrs respectively while a third pipe R can empty the tank in 30hrs. If all the pipes are opened together for 10hrs and then pipe R is closed then in what time the tank can be filled.

- a) $400/23\text{hrs}$
- b) $400/27\text{hrs}$

- c) 200/23hrs
d) 200/27hrs
e) None of these

Answer – b) 400/27hrs

Explanation :

$(1/20 + 1/25 - 1/30) \cdot 10 + (1/20 + 1/25) \cdot x = 1$
We get $x = 130/27$, so total time to fill the tank = $130/27 + 10 = 400/27$ hrs

□ **There are three taps A, B and C which can fill a tank in 12hrs, 15hrs and 30 hrs respectively. If the tap A is opened first, after one hour tap B was opened and after 2 hours from the start of A, tap C is also opened. Find the time in which the tank is full.**

- a) $6(2/11)$ hr
b) $6(3/11)$ hr
c) $5(3/11)$ hr
d) $5(2/11)$ hr
e) None of these

Answer –a) $6(2/11)$ hr

Explanation :

In first hour only A is opened, in the next hour A and B are opened and in the third hour A, B and C are opened.

So, in three hours $(3/12 + 2/15 + 1/30) = 25/60$ tank is already filled.

Now, $25/60 = (1/12 + 1/15 + 1/30) \cdot t$

$T = 25/11$. Total time = $3 + 25/11 = 58/11$ hours

□ **Three pipes P, Q and R can fill the tank in 5, 10 and 15 minutes respectively. If all the pipes are opened together and pipe Q is turned off 5 minutes before the tank is full. Then find the time in which the tank will full.**

- a) 45/11hrs
b) 53/11hrs
c) 51/13hrs
d) 47/11hrs
e) None of these

Answer – a) 45/11hrs

Explanation :

Let total time taken by the pipes is T hrs, then $(1/5 + 1/10 + 1/15) \cdot (T - 5) + (1/5 + 1/15) \cdot 5 = 1$

□ **A pipe can fill a tank in 20 minutes but due to a leak develop at the bottom of the tank, 1/5 of the water filled by the pipe leaks out. Find the time in which the tank is filled.**

- a) 20 min
b) 25 min
c) 30 min
d) can't be determined
e) None of these

Answer – b) 25 min

Explanation :

Amount of tank filled by the pipe in one minute = $1/20$ and due to leakage $1/5$ of $1/20$ leaks out so, $[1/20 - (1/5) \cdot (1/20)] \cdot T = 1$
We get $T = 25$

□ **A bathing tub can be filled by a cold pipe in 15 minutes and by a hot pipe in 10 minutes. Ramesh opened both the tap and leaves the bathroom and returns at the time when the tub should be full. He observed that a waste pipe is opened at the bottom, he now closes it. Now the tub will take more 5 minutes to fill the tank, find the time in which the leak can empty the tank.**

- a) $36/5$ min
b) $33/5$ min
c) $37/5$ min
d) can't be determined
e) None of these

Answer – a) $36/5$ min

Explanation :

$(1/15 + 1/10 - 1/x) \cdot 6 + (1/15 + 1/10) \cdot 5 = 1$
 $x = 36/5$

□ **There are 10 taps connected to a tank. Some of them are waste pipe and some of them are water pipe. Water pipe can fill the tank in 15 hours and waste pipe can empty the tank in 30 hours. Find the number of waste pipes if the tank is filled in 6 hours.**

- a) 3
b) 4
c) 5
d) 7
e) None of these

Answer – c) 5

Explanation :

Let water pipes are x and waste pipe are Y .

$$x + y = 10$$

$$(x/15 - y/30) * 6 = 1$$

Solve both equation to get x and y

☐ **Pipe A is 4 times as fast as B in filling a tank. If A takes 20 minutes to fill a tank, then what is the time taken by both the pipe A and B to fill the tank?**

- a) 12
- b) 16
- c) 18
- d) 20
- e) None of these

Answer – b) 16

Explanation :

A takes 20 minutes and it is 4 times faster than B, it means B will take 80 minutes to fill the tank.

$$(1/20 + 1/80) * t = 1. \text{ We get } t = 16$$

☐ **Pipe A is 4 times faster than pipe B and takes 45 minutes less to fill a tank. When both the pipes are opened together than the time in which the tank will be full.**

- a) 10 min
- b) 12 min
- c) 15 min
- d) 18 min
- e) None of these

Answer – b) 12 min

Explanation :

Let A take X minute to fill a tank then B will take $4x$ time.

$$4x - x = 45 \text{ (given), } X = 15.$$

$$\text{Time taken to fill the tank together} = (1/15 + 1/60) * t = 1$$

$$T = 12 \text{ minute}$$

☐ **Two pipes P and Q can fill a tank in 20 minutes and 30 minutes respectively. There is a waste pipe which withdraws water at the rate of 8 litres per minute. Now the tank is full and If all the pipes are opened simultaneously the tank is emptied in 60 minutes. Find the capacity of the tank.**

- a) 60ltr
- b) 70ltr
- c) 80ltr

d) 90ltr

e) None of these

Answer – c) 80ltr

Explanation :

$$(1/20 + 1/30 - 1/t) * 60 = -1$$

'-1' is taken because the work is negative. T is the time taken by the waste pipe to empty the tank alone. We will $t = 10$

$$\text{So capacity} = 10 * 8 = 80 \text{ltr}$$

☐ **There are 4 filling pipes and 3 emptying pipes capable of filling and emptying in 12 minutes and 15 minutes respectively. If all the pipes are opened together and as a result they fill 10 litres of water per minute. Find the capacity of the tank.**

- a) 65ltr
- b) 70ltr
- c) 75ltr
- d) 80ltr
- e) None of these

Answer – c) 75ltr

Explanation :

$$(4/12 - 3/15) * t = 1$$

$t = 15/2$ minute – in this time the tank will be filled. So the capacity = $(15/2) * 10 = 75$ litre

☐ **Two taps can separately fill the tank in 10m and 15min respectively. They fill the tank in 12 minutes when a third pipe which empties the tank is also opened. What is the time taken by the third pipe to empty the whole tank?**

- A) 14 minutes
- B) 15 minutes
- C) 12 minutes
- D) 20 minutes
- E) 16 minutes

C) 12 minutes

Explanation:

$$1/10 + 1/15 - 1/x = 1/12$$

$$\text{Solve, } x = 12$$

☐ **Two pipes A and B can fill a tank in 12 hours and 15 hours respectively. If they are opened on alternate hours with pipe A opened first, then in how many hours the tank will be full?**

- A) 13 hrs
- B) 14 1/2 hrs
- C) 12 hrs
- D) 12 1/2 hrs
- E) 10 2/3 hrs

D) 12 1/2 hrs

Explanation:

A = 12 hours, B = 15 hours

Total work = LCM(12,15) = 60

So efficiency of A = $60/12 = 5$, efficiency of B = $60/15 = 4$

2 hrs work of (A+B) = $5+4 = 9$

2*6(12) hours work of (A+B) = $9*6 = 54$

So remaining work = $60-54 = 6$

Now A's turn at 13th hour, he will do remaining work(6) in 6/12 hr

So total 12 1/2 hrs

☐ **Pipes P and Q can fill the tank in 24 minutes and 32 minutes respectively. Both piped are opened together. To have the tank full in 18 minutes, after how many minutes the pipe P must be closed?**

- A) 22 minutes
- B) 21 minutes
- C) 15 minutes
- D) 12.5 minutes
- E) 10.5 minutes

E) 10.5 minutes

Explanation:

P is to be closed before 18 minutes, let it is closed after x minutes, then Q worked for all 18 minutes. So,

$$(1/24)*x + (1/32)*18 = 1$$

Solve, $x = 10.5$

☐ **Three pipes, A, B and C are opened to fill a tank such that A and B can fill the tank alone in 36 min. and 45 min. respectively and C can empty it in 30 min. After 6 minutes the emptying pipe is closed. In how many minutes the tank will be full in this way?**

- A) 20
- B) 25
- C) 18
- D) 24
- E) 30

D) 24

Explanation:

Let the tank full in x minutes, then A and B opened for x minutes and C for 6 minutes.

$$(1/36 + 1/45)*x - (1/30)*6 = 1$$

$$(1/20)*x = 6/5$$

Solve, $x = 24$

☐ **A and B are pipes such that A can empty the tank in 60 minutes and B can fill in 30 minutes. The tank is full of water and pipe A is opened. If after 18 minutes, pipe B is also opened, then in how much total time the tank will be full again?**

- A) 32 minutes
- B) 29 minutes
- C) 36 minutes
- D) 23 minutes
- E) 18 minutes

B) 36 minutes

Explanation:

Emptying pipe A is opened first for 18 minutes, so in 18 minutes the part of tank it has emptied is $(1/60)*18 = 9/30$

Now filling pipe is also opened, now since only 9/30 of the tank is empty so 9/30 is only to be filled by both pipes, let it take now x minutes, so $(1/30 - 1/60)*x = 9/30$

Solve, $x = 18$

So total = $18+18 = 36$ minutes [total time is asked – 18 minutes when emptying pipe was only opened, 18 minutes when both were operating.]

☐ **Two pipes A and B can alone fill a tank in 20 minutes and 30 minutes respectively. But due to a leak at the bottom of tank, it took 3 more minutes to fill the tank. In how many hours, the leak can alone empty the full tank?**

- A) 60
- B) 30
- C) 48
- D) 56
- E) 72

A) 60

Explanation:

A and B can fill tank in $(1/20 + 1/30) = 1/12$ so 12 minutes

But it took 3 more minutes, this means the tank

got full in $12+3 = 15$ minutes
 So $(1/20 + 1/30 - 1/x) = 1/15$
 Solve, $x = 60$

□ **Pipes A and B can fill a cistern in 15 hours together. But if these pipes operate separately A takes 40 hours less than B to fill the tank. In how many hours the pipe A will fill the cistern working alone?**

- A) 60
- B) 20
- C) 40
- D) 15
- E) 25

B) 20

Explanation:

Let A takes x hours, then $B = (x+40)$ hours
 $1/x + 1/(x+40) = 1/15$
 Solve, $x = 20$

□ **Three pipes A, B and C can fill the cistern in 10, 12, and 15 hours respectively. In how much time the cistern will be full if A is operated for the whole time and B and C are operated alternately which B being first?**

- A) 10 hours 32 minutes
- B) 6 hours
- C) $5\frac{1}{2}$ hours
- D) $5\frac{7}{10}$ hours
- E) $9\frac{2}{11}$ hours

D) $5\frac{7}{10}$ hours

Explanation:

In first hour, part of cistern filled is $(1/10 + 1/12) = 11/60$

In second hour, part of cistern filled is $(1/10 + 1/15) = 1/6$

So in 2 hours, part of cistern filled is $11/60 + 10/60 = 21/60 = 7/20$

now in 2×2 (4) hours, part of cistern filled is $(7/20) \times 2 = 14/20 = 7/10$

now in the 5th hour, A+B's turn which fill $11/60$ in that hour, but the cistern remaining to be filled is $(1 - 7/10) = 3/10$, since $3/10$ is more than $11/60$, so after 5th hour remaining part to be filled is $3/10 - 11/60 = 7/60$

now in 6th hour, (A+C)'s turn, it will fill remaining $7/60$ in $(7/60) \times (6/1) = 7/10$

so total $5\frac{7}{10}$ hours

□ **A cistern is $1/4$ th full. Two pipes which fill the cistern in 15 minutes and 20 minutes respectively are opened simultaneously. After 5 minutes, a third pipe which empties the full cistern in 30 minutes is also opened. In how many minutes the cistern will be full?**

- A) $6\frac{1}{2}$
- B) 2
- C) 5
- D) 7
- E) 8

D) 7

Explanation:

Since $1/4$ th is already filled, $3/4$ th is to be filled now.

So

$$(1/15 + 1/20) \times (5+x) - (1/30) \times x = 3/4$$

$$(7/60) \times 5 + (7/60 - 1/30) \times x = 3/4$$

$$(5/60) \times x = 2/12$$

Solve, $x = 2$ mins

So total 7 minutes

□ **Pipes A, B and C which fill the tank together in 6 hours are opened for 2 hours after which pipe C was closed. Find the number of hours taken by pipe C to fill the tank if the remaining tank is filled in 7 hours.**

- A) 16
- B) 14
- C) 20
- D) 22
- E) Cannot be determined

B) 14

Explanation:

$$1/A + 1/B + 1/C = 1/6$$

Now given that first all open for 2 hours, then C closed and A+B completes in 7 hours, so

$$(1/A + 1/B + 1/C) \times 2 + (1/A + 1/B) \times 7 = 1$$

$$\text{Put } 1/A + 1/B = 1/6 - 1/C$$

$$(1/6 - 1/C + 1/C) \times 2 + (1/6 - 1/C) \times 7 = 1$$

$$2/6 + 7/6 - 7/6 = 1$$

Solve, $C = 14$

□

Three pipes A, B and C can fill a cistern in 6 hours. After working at it together for 2 hours, C is closed and A and B can fill the remaining part in 6 hours. The number of hours taken by C alone to fill the cistern is

- A.12hrs
B.10hrs
C.18hrs
D.8hrs
E.None of these

Answer – C.18hrs

Explanation :

$$A+B+C \text{ in } 1h = 1/6$$

$$A+B+C \text{ in } 2h = 2/6 = 1/3$$

$$\text{Remaining} = 1 - 1/3 = 2/3$$

$$A+B \text{ in } 6hrs = 2/3$$

$$A+B \text{ in } 1hr = 2/18$$

$$C \text{ alone to fill the cistern} = 1/6 - 2/18 = 3-2/18 = 1/18$$

□ Pipes A and B can fill a tank in 5 and 3 hrs respectively. Pipe C can empty it in 15 h. The tank is half full. All the three pipes are in operation simultaneously. After how much time the tank will be full ?

- A.1(7/15)hrs
B.2(1/11)hrs
C.1(1/14)hrs
D.2(3/11)hrs
E.None of these

Answer – C.1(1/14)hrs

Explanation :

$$\text{In } 1 \text{ hr} = 1/5 + 1/3 - 1/15 = 3+5-1/15 = 7/15$$

$$\frac{1}{2} \text{ tank filled by 3 pipes} = 15/7 * 1/2 = 15/14 = 1(1/14)$$

□ Two pipes A and B can fill a tank in 10 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.12m
B.10m
C.8m
D.16m
E.None of these

Answer – A.12m

$$\text{Explanation : } A + B \text{ in } 4 \text{ minute} = 4 (1 / 10 + 1 / 20) =$$

$$4(2+1/20) = 12/20 = 3/5$$

$$\text{Part remaining} = 1 - (3 / 5) = 2 / 5$$

$$1 / 20 \text{ part is filled by B in } 1 \text{ minute}$$

$$2 / 5 \text{ part will be filled in } = (20) * (2 / 5) =$$

8 minutes

$$\text{Total} = 8+4 = 12m$$

□ Two pipes A and B can fill a tank in 6 hours and 5 hours respectively. If they are turned on alternatively for 1 hour each, find the time in which the tank is full. (Assume pipe A is opened first)

- A.4hrs 30min
B.5hrs
C.6hrs 25min
D.5hrs 30min
E.None of these

Answer – D. 5hrs 30min

Explanation :

$$\text{Total} = 30, A = 30/6 = 1/5, B = 30/5 = 1/6$$

$$\text{In } 2 \text{ hrs} = 5+6 = 11$$

$$\text{In } 4hrs = 22$$

$$\text{Remaining} = 30-22 = 8$$

$$1hr \text{ Pipe A} = 8-5 = 3, \text{Remaining B} = 3 * 1/6 = 30min$$

$$\text{Total} = 5hrs 30min$$

□ Pipes A, B and C can fill a tank in 3, 4 and 6 hours respectively. If all the pipes are opened together and after 30 minutes pipes B and C are turned off, find the total time in which the tank is full.

- A.2(3/8)hrs
B.1(1/7)hrs
C.2(2/7)hrs
D.3(1/3)hrs
E.None of these

Answer – A.2(3/8)hrs

Explanation :

$$\text{In } 1 \text{ hr } A, B, C = 1/3 + 1/4 + 1/6 = 8+6+4/24 = 18/24 = 6/8 = 3/4$$

$$\text{Filled in } 30m = 3/8$$

$$\text{Remaining} = 1 - 3/8 = 5/8$$

$$\text{Pipe A} = 3 * 5/8 = 15/8$$

$$\text{Total} = 15/8 + 1/2 = 15+4/8 = 19/8 = 2(3/8) \text{ hrs}$$

□ Two pipes M and N can fill a tank in 30 and 45 minutes respectively. If both the pipes were open for few minutes after N was closed and the tank was full in 25 minutes, find the time for pipe N was open.

- A.8.16m
B.7.5min

- C.5min
D.10.2m
E.None of these

Answer – B.7.5min

Explanation :

$$X(1/30 + 1/45) + 1/30(25-x) = 1$$

$$x/45 + 25/30 = 1$$

$$x/45 = 5/30 = 1/6$$

$$x = 45/6$$

$$x = 7.5m$$

□ A cistern is filled by 3 pipes A, B and C with uniform flow. The second pipe B takes $3/2$ times the time taken by A to fill the tank, while C takes twice the time taken by B to fill the tank. If all the three pipes can fill the tank in 7 hours, find the time required by pipe A alone to fill the tank.

- A.10hrs
B.12hrs
C.14hrs
D.15hrs
E.None of these

Answer – C.14hrs

Explanation :

$$1/x + 1/(3/2x) + 1/2(3x/2) = 1/7$$

$$6/3x = 1/7$$

$$3x/6 = 7$$

$$3x = 42$$

$$x = 14$$

□ Two pipes P and Q can fill a tank in 8 hours. If only pipe P is open then it would take 4 hours longer to fill the tank. Find how much longer would it take if only pipe Q is open.

- A.16hrs
B.12hrs
C.10hrs
D.8hrs
E.None of these

Answer – A.16hrs

Explanation :

$$P = 8 + 4 = 12$$

$$P + Q = 1/8$$

$$Q = 1/8 - 1/12 = 3 - 2/24 = 1/24$$

$$Q = 24$$

$$Q \text{ alone} = 24 - 8 = 16$$

□ Two pipes P and Q can fill a tank in 20m and 30m respectively. If both the pipes are opened simultaneously, after how much time should Q be closed so that the tank is full in 16minutes ?

- A.12min
B.6min
C.10min
D.7min
E.None of these

Answer – B.6min

Explanation :

$$X(1/20 + 1/30) + (16-x)1/20 = 1$$

$$5x/60 + 16-x/20 = 1$$

$$5x + 48 - 3x/60 = 1$$

$$2x + 48 = 60$$

$$2x = 12$$

$$x = 12/2 = 6$$

□ A tap can fill a tank in 12 minutes and another tap can empty the tank in 6 minutes. If the tank is already full and then both the taps are opened the tank will be

- A.Filled in 6 minutes
B.Emptied in 6 minutes
C.Filled in 6 minutes
D.Emptied in 12 minutes
E.None of these

Answer – D.Emptied in 12 minutes

Explanation :

$$1/12 - 1/6 = 1 - 2/12 = -1/12$$

□ Two taps can separately fill the tank in 18m and 12min respectively and when the waste pipe is open, they can together fill the tank in 9minutes. The waste pipe can empty the tank in

- A.20min
B.25min
C.36min
D.30min
E.None of these

Answer – C.36min

Explanation :

$$1/18 + 1/12 = 3 + 2/36 = 5/36$$

$$5/36 - 1/9 = 5 - 4/36 = 1/36 \Rightarrow 36min$$

□ **Two pipes can fill the tank in 4hrs 5hrs respectively while the third pipe can empty the tank in 20hrs, if all the pipes are opened together, then the tank will be filled in**

- A.2.30hrs
- B.2.50hrs
- C.3.20hrs
- D.3.30hrs
- E.None of these

Answer – A.2.30hrs

Explanation :

$$1/4 + 1/5 - 1/20 = 5 + 4 - 1/20 = 8/20$$

$$20/8 \Rightarrow 2(1/2)\text{hrs}$$

□ **10 buckets of water fill a tank when the capacity of each bucket is 14 liter. How many buckets will be needed to fill the same tank, if the capacity of each bucket is 7litres ?**

- A.10
- B.12
- C.18
- D.20
- E.None of these

Answer – D.20

Explanation :

$$10 * 14 = x * 7$$

$$X = 10 * 14 / 7 = 20$$

□ **A leak in the bottom of a tank can empty the full tank in 7 hours. An inlet pipe fills water at the rate of 2 litres a minute. When the tank is full the inlet is opened and due to the leak the tank is empty in 8 hours. The capacity of the tank in litres is**

- A.3450litres
- B.5460litres
- C.7620litres
- D.6720 litres
- E.None of these

Answer – D.6720 litres

Explanation :

$$\text{In 1 hr} = 1/7 - 1/8 = 8 - 7/56 = 1/56$$

$$\text{In 1 min} = 1/(56 * 60) = 1/3360$$

Inlet pipe fill water at the rate of 2 liters a minute = $2 * 3360 = 6720\text{litres}$

□ **Two pipes P and Q can fill a tank in 6 hours and 8 hours respectively. If they are opened on**

alternate hours and if pipe P is opened first, in how many hours, the tank shall be full ?

- A.10 hrs
- B.9.30hrs
- C.6.45hrs
- D.10.30hrs
- E.None of these

Answer – C. 6.45hrs

Explanation :

$$1/6 + 1/8 = 8 + 6/48 = 14/48 = 7/24 \dots \dots \dots \text{in 2 hr}$$

$$= 21/24 \dots \dots \dots 6\text{hrs}$$

$$P \Rightarrow 6 * 3/24 \Rightarrow 3/4 = 45\text{min}$$

$$\text{Total} = 6\text{hrs } 45\text{min}$$

□ **Two pipes can fill a tank in 10 hours and 12 hours respectively while a third pipe empties the full tank in 20 hours. If all the three pipes operate simultaneously, in how much time will the tank be filled?**

- A.7hrs
- B.8hrs
- C.7hrs 30 min
- D.9hrs 30min
- E.None of these

Answer – C.7hrs 30 min

Explanation :

$$\text{Net apart filled in 1 hour} = (1/10 + 1/12 - 1/20)$$

$$= 8/60 = 2/15.$$

$$\text{Tank will be full in} = 15/2 \text{ hours} \Rightarrow 7 \text{ hrs } 30 \text{ min.}$$

□ **One pipe can fill a tank 4 times as fast as another pipe. If together the two pipes can fill the tank in 15 minutes, then the slower pipe alone will be able to fill the tank in:**

- A.75minutes
- B.60minutes
- C.55minutes
- D.45minutes
- E.None of these

Answer – A.75minutes

Explanation :

$$1/x + 4/x = 1/15$$

$$5/x = 1/15$$

$$X/5 = 15$$

$$X = 75\text{minutes}$$

☐ **Bucket A has thrice the capacity as bucket B. It takes 20 turns for bucket P to fill the empty drum. How many turns it will take for both the buckets A and B having each turn together to fill the empty drum**

- A.12
- B.10
- C.15
- D.16
- E.None of these

Answer – C.15

Explanation :

$$A = 3B$$

$$A = 60, B = 20$$

$$\text{No of turns} = xy/x+y$$

$$\text{No of turns} = 60*20/20+60 = 1200/80 = 15 \text{ turns}$$

☐ **Two pipes A and B would fill a cistern in 20m and 30min respectively, both pipes are kept open for 10min and the first pipe be turned off after that the cistern may be filled in A.6min**

B.5min

C.8min

D.10min

E.None of these

Answer – B.5min

Explanation :

$$10(1/20+1/30) = 10[3+2/60] = 50/60 = 5/6$$

$$\text{Remaining part} = 1-5/6 = 6-5/6 = 1/6$$

$$\text{Second pipe} = 30*1/6 = 5\text{min}$$

☐ **Tap A can fill the empty tank in 12hrs but due to leak in the bottom it is filled in 15hrs.If the tank is full ,then tap is closed.In how many hours the leak can empty the tank ?**

A.60hrs

B.50hrs

C.45hrs

D.30hrs

E.None of these

Answer – A.60hrs

Explanation :

$$1/12 - 1/15 = 5-4/60 = 1/60$$