

Pipes & Cistern in Quantitative Aptitude for Government Exams

Words problems based on pipes and cistern is a common topic from which questions are asked in the quantitative aptitude sections for various competitive exams conducted in the country, including banks, SSC, RRB, Insurance and others.

Important Formula on Pipes and Cistern

Given below are a few important formulas which shall help you solve the pipes and cistern based questions quicker and more efficiently:

- If x hours are required to fill up a tank, then part filled in 1 hr =1/x
- If y hours are required to empty the tank, then part emptied in 1 hour = 1/y
- If a pipe can fill a tank in x hours and can empty the same tank in y hours. When both the pipes are opened at the same time, then the net part of the tank filled in 1 hr = {(xy) / (y-x)}, provided y>x
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- Net work done = (Sum of work done by Inlets) (Sum of work done by Outlets)
- One inlet can fill the tank in x hr and the other inlet can fill the same tank in y hrs, if both the inlets are opened at the same time, the time taken to fill the whole tank = {(xy) / (y+x)}
- If two pipes take x and y hours respectively to fill a tank of water and a third pipe is opened which takes z hours to empty the tank, then the time taken to fill the tank = $\{1 / (1/x)+(1/y)+(1/z)\}$ and the net part of the tank filled in 1 hr = (1/x)+(1/y)-(1/z)

Pipes and Cistern - Sample Questions

Given below are a few sample questions for the reference of candidates.

Q 1. A pipe can fill a tank with water in 2 hours. Because of an outlet, it took 2 ¹/₃ hours to fill the tank. How much time will it take for the outlet to drain all the water present in the tank?

- 1. 12 hours
- 2. 11 hours
- 3. 14 hours
- 4. 21 hours
- 5. 12 hours 35 minutes

Answer: (3) 14 hours

Solution: Work done by outlet in 1 hour = (1/2 - 7/3) = 1/14Thus, it will take 14 hours for the outlet to empty the tank

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Q 2. It takes two pipes A and B, running together, to fill a tank in 6 minutes. It takes A 5 minutes less than B to fill the tank, then what will be the time taken by B alone to fill the tank?

- 1. 10 minutes
- 2. 15 minutes
- 3. 20 minutes
- 4. 25 minutes
- 5. 8 minutes

Answer: (2) 15 minutes

Solution:

Let the time taken by pipe A to fill the tank be x minutes Time taken by pipe B to fill the tank = x+5 minutes So, 1/x + 1/(x+5) = 1/6 $\Rightarrow x = 10$ Thus, time taken by B alone to fill the tank is 10+5, i.e., 15 minutes

Q 3. If two pipes can fill a tank in 24 and 20 minutes respectively and another pipe can empty 3 gallons of water per minute from that tank. When all the three pipes are working together, it takes 15 minutes to fill the tank. What is the capacity of the tank?

- 1. 100 gallons
- 2. 150 gallons
- 3. 125 gallons
- 4. 130 gallons
- 5. 120 gallons

Answer: (5) 120 gallons

Solution:

Work done by the outlet pipe in 1 minute = $\{1/15 - (1/24) + (1/20)\} = 1/15 - 11/120 = -(1/40)$ Here, the negative sign indicates the negative work done, that is the loss of water from the outlet Capacity of 1/40 part = 3 gallons So, Capacity of whole tank = $40 \times 3 = 120$ gallons

Q 4. It takes 20 minutes for pipe A to fill the tank completely and it takes 30 minutes for pipe B to fill the tank completely. If both the inlets are opened together, then how much time will be taken to fill the tank completely?

- 1. 15 minutes
- 2. 12 minutes
- 3. 11 minutes
- 4. 10 minutes
- 5. 22 minutes

Answer: (2) 12 minutes



Solution:

Portion of the tank filled by pipe A in 1 minute = 1/20Portion of the tank filled by pipe B in 1 minute = 1/30Total portion filled by both pipe A and B in 1 minute = (1/20 + 1/30) = 1/12Thus it will take 12 minutes to fill the tank completely if both the inlets are opened together.

Q 5. Pipe A can fill the tank 3 times faster in comparison to pipe B. It takes 36 minutes for pipe A and B to fill the tank together. How much time will pipe B alone take to fill the tank?

- 1. 100 minutes
- 2. 124 minutes
- 3. 134 minutes
- 4. 144 minutes
- 5. 154 minutes

Answer: (4) 144 minutes

Solution:

Let the time taken by pipe B be x minutes So, the time taken by pipe A = x/3 minutes Thus, 1/3 + 3/x = 1/36 $\Rightarrow 4/x = 1/36$ $\Rightarrow x = 4 \times 36$ $\Rightarrow x = 144$ minutes

Interested candidates can also check the other quantitative aptitude concepts which are a part of the Government exam section in the links mentioned below:

How To Solve Number Series	Data Interpreparation	Problems on Ages
Boat and Stream	Simplification & Approximation Questions	Data Sufficiency