

# Pipes and Cisterns

## EXERCISE 12A

For SSC GD & MTS Exams

- Pipes A and B can fill a tank in 24 hours and 30 hours, respectively, while pipe C can empty it in  $x$  hours. A and B are kept open for 10 hours at the same time and then C is opened. If the tank become empty in 90 hours, then what is the value of  $x$ ?  
SSC MTS 22/08/2019 (Shift-3)  
(a) 15 (b) 12  
(c) 18 (d) 20
- Pipes A and B can empty a filled tank in 20 hours and 15 hours respectively, while pipe C alone can fill the same tank in  $x$  hours. The three pipes have been opened simultaneously and they took 40 minutes to finish the  $\frac{1}{18}$  (one-eighteenth) part of the tank. The value of  $x$  is:  
SSC MTS 21/08/2019 (Shift-3)  
(a) 21 (b) 30  
(c) 26 (d) 24
- An inlet pipe can fill a tank in 2 hours and an outlet pipe can empty a fully filled tank in 3 hours. If the inlet and outlet pipe are opened simultaneously, in what time will the empty tank be filled?  
SSC MTS 20/08/2019 (Shift-3)  
(a) 2 h (b)  $\frac{3}{2}$  h  
(c) 3 h (d) 6 h
- Pipes A and B can empty a fully filled tank in 8 and 12 hours respectively. C is a filling pipe. These three pipes were opened at the same time and in one hour the sixth part of the tank became empty in one hour. In how much time can C fill the tank alone?  
SSC MTS 20/08/2019 (Shift-2)  
(a) 25 hours (b) 20 hours  
(c) 30 hours (d) 24 hours
- A pipe can fill a tank in 56 hours, but due to leakage in its base, it takes 16 hours more to fill it. Only in how much time (in hours) can the  $83\frac{1}{3}\%$  portion of the leakage tank be consumed?  
SC MTS 20/08/2019 (Shift-1)  
(a) 126 (b) 210  
(c) 252 (d) 105
- Pipe A can fill a tank in 10 hours. Pipe B can fill the same tank in 12 hours. Pipe C can empty a full tank in 16 hours. All the pipes are opened at 8:00 AM and pipe A and B are closed at 10:00 AM. After how much time from starting will the tank be empty?  
SSC MTS 19/08/2019 (Shift-1)  
(a) 5 hours 52 minutes (b) 5 hours 24 minutes  
(c) 4 hours 30 minutes (d) 4 hours 8 minutes
- Two pipes P and Q can fill an empty tank in 20 minutes and 10 minutes respectively. R can empty a full tank in 15 minutes. If all three pipes are opened together, how much time (in minutes) will they take to fill the tank?  
SSC MTS 14/08/2019 (Shift-3)  
(a) 12 (b) 18  
(c) 10 (d) 15
- Pipe A can fill a tank in 36 minutes and pipe B is able to empty this in 45 minutes. If both pipes are opened simultaneously, then the tank will filled half in ..... hours.  
SSC MTS 13/08/2019 (Shift-1)  
(a) 2 (b) 1.5  
(c) 1.25 (d) 1.75
- Pipe  $V_1$  can fill an empty tank in 8 hours. Pipe  $V_2$  can fill the same tank in 16 hours. Pipe  $V_3$  can empty the same, completely filled, tank in 12 hours. If three pipes are opened simultaneously, then in how much time will the tank get completely filled?  
SSC MTS 8/08/2019 (Shift-2)  
(a)  $\frac{41}{3}$  hours (b)  $\frac{42}{11}$  hours  
(c)  $\frac{38}{5}$  hours (d)  $\frac{48}{5}$  hours
- Pipe  $D_1$  can fill an empty tank in 80 minutes and Pipe  $D_2$  can empty the same tank in 100 minutes. If pipes are opened simultaneously, then in how much time the tank gets completely filled?  
SSC MTS 7/08/2019 (Shift-3)  
(a) 320 minutes (b) 400 minutes  
(c) 200 minutes (d) 240 minutes
- Pipe A can fill an empty tank completely in 11 hours. Pipe B can empty this fully filled tank in 15 hours. If both the pipes are opened simultaneously, in what time will the empty tank be filled?  
SSC MTS 5/08/2019 (Shift-2)

- (a) 41 hours and 15 minutes
- (b) 49 hours and 45 minutes
- (c) 47 hours and 30 minutes
- (d) 39 hours and 15 minutes

12. Pipe P can fill a tank alone in 7 hours. Pipe Q can fill the same tank alone in 13 hours. In how much time can they together fill the tank?

SSC MTS 2/08/2019 (Shift-3)

- (a) 3 hours 18 minutes    (b) 3 hours 45 minutes
- (c) 4 hours 12 minutes    (d) 4 hours 33 minutes

13. Pipe A can fill a tank in 6 hours. Pipe B can fill the same tank in 8 hours. Pipe A, B and C together can fill the same tank in 12 hours, then which of the following statements is true for pipe C?

SSC MTS 2/08/2019 (Shift-1)

- (a) It can fill the tank in 4 hours 40 minutes
- (b) It can fill the tank in 4 hours 48 minutes
- (c) It can empty the tank in 4 hours 48 minutes
- (d) It can empty the tank in 4 hours 40 minutes

**SOLUTIONS 12A**

1. (b)

	Time	LCM	Efficiency
A	24	120	5
B	30		
C	<input type="checkbox"/>		⑩

$9 \times 10 = 90$

$C = \frac{120}{10} = 12 \text{ h}$

$90 = 90 \text{ h}$

$1 = 1 \text{ h}$

Efficiency of C =  $5 + 4 + 1$

= 10

2. (b)

	Time	LCM	Efficiency
A	20	60	3
B	15		
C	<input type="checkbox"/>		②

$7$  }  $-5$

$\frac{1}{18} \text{ part} = 40 \text{ min}$

$1 = \frac{40 \times 18}{60} = 12$

$\Rightarrow \frac{60}{12} = 5$

$C = \frac{60}{2} = 30 \text{ h}$

3. (d)

	Time	LCM	Efficiency
+2	6	3	3
-3			

}  $\ominus 1$

$\frac{6}{1} = 6 \text{ hours}$

4. (d)

	Time	LCM	Efficiency
-A	8	24	3
-B	12		
+C	<input type="checkbox"/>		①

$5$  }  $-4$

$\frac{1}{6} \text{ Part} = 1 \text{ h} \Rightarrow 1 = 6 \text{ h}$

$\frac{24}{6} = 4$

$C = \frac{24}{1} = 24 \text{ hour}$

5. (b)

	Time	LCM	Efficiency
56	504	9	2
72			

$2$  }  $7$

$83\frac{1}{3}\% = \frac{5}{6}$

$= \frac{504}{2} \times \frac{5}{6}$

$= 210 \text{ h}$

6. (a)

	Time	LCM	Efficiency
A	10	240	24
B	12		
+C	16		15

$44$  }  $29 \times 2 = 58$

$\frac{58}{15} = 13\frac{13}{15} \text{ h} = 3 \text{ h } 52 \text{ min}$

Total time =  $2 \text{ h} + 3 \text{ h } 52 \text{ min}$

=  $5 \text{ h } 52 \text{ min}$

7. (a)

	Time	LCM	Efficiency
P	20	60	3
Q	10		
-R	15		4

$9$  }  $5$

$\frac{60}{5} = 12 \text{ min}$

8. (b)

	Time	LCM	Efficiency
A	36	180	5
-B	45		

$1$  }  $1$

$180 \times 1 \times \frac{1}{2} = 90 \text{ min} = 1.5 \text{ hour}$

9. (d)

	Time	LCM	Efficiency
V <sub>1</sub>	8	48	6
V <sub>2</sub>	16		
-V <sub>3</sub>	12		4

$9$  }  $5$

**EXERCISE 12C**

For SSC CGL &amp; CPO Exams

1. Pipes A and B are filling pipes while C is an emptying pipe. A and B can fill a tank in 72 and 90 minutes respectively. When all the three pipes are opened together, the tank gets filled in 2 hours. A and B are opened together for 12 minutes, then closed and C is opened. The tank will be empty after:

**SSC CGL TIER II (13/09/2019)**

- (a) 15 minutes      (b) 18 minutes  
(c) 12 minutes      (d) 16 minutes

2. Pipes A and B can fill a tank in 16 hours and 24 hours, respectively, and pipe C alone can empty the full tank in  $x$  hours. All the pipes were opened together at 10.30 a.m., but C was closed at 2:30 p.m. If the tank was full at 8:30 p.m. on the same day, then what is the value of  $x$ ?

**SSC CGL TIER II (12/09/2019)**

- (a) 64      (b) 48  
(c) 45      (d) 96

3. Pipes A, B and C can fill a tank in 30 h, 40 h and 60 h respectively. Pipes A, B and C are opened at 7 a.m., 8 a.m., and 10 a.m., respectively on the same day. When will the tank be full?

**SC CGL TIER II (11/09/2019)**

- (a) 10.00 p.m.      (b) 10.20 p.m.  
(c) 9.20 p.m.      (d) 9.40 p.m.

4. Pipes A and B can fill a tank in one hours and two hours respectively while pipe C can empty the filled up tank in one hour and fifteen minutes. A and C are turned on together at 9 a.m. After 2 hours, only A is closed and B is turned on. When will the tank be emptied?

**SSC CGL 6/06/2019 (Shift-1)**

- (a) 12:10 p.m.      (b) 11:30 a.m.  
(c) 10:30 a.m.      (d) 12.20 p.m.

5. Pipes A and B can fill a tank in 10 hours and 40 hours, respectively. C is an outlet pipe attached to the tank. If all the three pipes are opened simultaneously, it takes 80 minutes more time than what A and B together take to fill the tank. A and B are kept open for 7 hours and then closed and C is opened. C will now empty the tank in:

**SSC MTS 20/08/2019 (Shift-1)**

- (a) 45.5 hours      (b) 38.5 hours  
(c) 42 hours      (d) 49 hours

$$= \frac{48}{5} \text{ hours}$$

10. (b)  $\begin{array}{l} D_1 \quad 80 \\ -D_2 \quad 100 \end{array} \left. \begin{array}{l} \\ \\ \end{array} \right\} 400 \left\langle \begin{array}{l} 5 \\ - \\ 4 \end{array} \right] 1$

$$\frac{400}{1} = 400 \text{ min}$$

11. (a)  $\begin{array}{l} A \quad 11 \\ -B \quad 15 \end{array} \left. \begin{array}{l} \\ \\ \end{array} \right\} 165 \left\langle \begin{array}{l} 15 \\ - \\ 11 \end{array} \right] 4$

$$\frac{165}{4} = 41\frac{1}{4} \text{ h} = 41 \text{ h } 15 \text{ min}$$

12. (d)  $\begin{array}{l} P \quad 7 \\ Q \quad 13 \end{array} \left. \begin{array}{l} \\ \\ \end{array} \right\} 91 \left\langle \begin{array}{l} 13 \\ + \\ 7 \end{array} \right] 20$

$$\frac{91}{20} = 4\frac{11}{20} \text{ h} = 4 \text{ h } 33 \text{ min}$$

13. (c) 

	Time	LCM	Efficiency	
A	6	48	8	+ ] 14
B	8		6	
A + B + C	12		4	- ] 10

$$\frac{48}{10} = 4\frac{8}{10} \text{ h} = 4 \text{ h } 28 \text{ min}$$

C empty the tank in 4 h 48 min

**EXERCISE 12B**

For SSC GD &amp; MTS Exams

1. An inlet pipe can fill a tank in 10 hours and an outlet pipe can empty the completely filled tank in 20 hours. Both the pipes are opened at 6.30 a.m. When will the tank get filled? **SC CHSL 03/07/2019 (Shift-2)**

- (a) 2.30 a.m. next day      (b) 2 a.m. next day  
(c) 1 a.m. next day      (d) 12:00 midnight

**SOLUTIONS 12A**

1. (b)  $\begin{array}{l} 10 \\ -20 \end{array} \left. \begin{array}{l} \\ \\ \end{array} \right\} 20 \left\langle \begin{array}{l} 2 \\ - \\ 1 \end{array} \right] 10$

$$\frac{20}{1} = 20 \text{ hours}$$

6:30 a.m. + 20 h = Next day 2:30 a.m.

**SOLUTIONS 12B**

1. (b) 

	Time	LCM	Efficiency	
A	72	360	5	+ ] 9
B	90		4	
A + B - C	120		3	- ] 6

$$C = \frac{9 \times 12}{6} = 18 \text{ min}$$

2. (d) 
$$\begin{array}{l} \text{A} \quad 16 \\ \text{B} \quad 24 \\ -\text{C} \end{array} \left. \vphantom{\begin{array}{l} \text{A} \\ \text{B} \\ -\text{C} \end{array}} \right\} 48 \left\langle \begin{array}{l} 3 \\ + \\ 2 \\ \oplus \end{array} \right] 5 \times 10 = 50$$

$\frac{2}{2} = 4 \text{ h}$   
 $\frac{1}{1} = 2 \text{ h}$   
 $C = 48 \times 2 = 96 \text{ h}$

3. (c) 
$$\begin{array}{l} \text{Time} \quad \text{LCM} \quad \text{Efficiency} \\ \text{A} \quad 30 \\ \text{B} \quad 40 \\ \text{C} \quad 60 \end{array} \left. \vphantom{\begin{array}{l} \text{A} \\ \text{B} \\ \text{C} \end{array}} \right\} 120 \left\langle \begin{array}{l} 4 \times 3 = 12 \\ 3 \times 2 = 6 \\ + \\ 2 \\ \oplus \end{array} \right] 18$$

$4 + 3 + 2 = 9$   
 $120$   
 $\frac{-18}{102} \Rightarrow \frac{102}{9} = 11 \text{ h } 20 \text{ min}$   
 $\Rightarrow 9:20 \text{ p.m.}$

4. (d) 
$$\begin{array}{l} \text{Time} \quad \text{LCM} \quad \text{Efficiency} \\ \text{A} \quad 1 \\ \text{B} \quad 2 \\ -\text{C} \quad \frac{5}{4} \end{array} \left. \vphantom{\begin{array}{l} \text{A} \\ \text{B} \\ -\text{C} \end{array}} \right\} 120 \left\langle \begin{array}{l} 10 \\ 5 \\ 8 \\ \ominus \end{array} \right] 2 \times 2 = 4$$

$B - C \Rightarrow 5 - 8 = -3$   
 $\frac{4}{3} = 1\frac{1}{3} \text{ h} = 1 \text{ h } 20 \text{ min}$   
 Total Time =  $2 \text{ h} + 1 \text{ h } 20 \text{ min}$   
 =  $3 \text{ h } 20 \text{ min}$   
 $\Rightarrow 12:20 \text{ p.m.}$

5. (d) 
$$\begin{array}{l} \text{A} \quad 10 \\ \text{B} \quad 40 \end{array} \left. \vphantom{\begin{array}{l} \text{A} \\ \text{B} \end{array}} \right\} 40 \left\langle \begin{array}{l} 4 \\ + \\ 1 \\ \oplus \end{array} \right] 5$$

$A + B = \frac{40}{5} = 8 \text{ h}$   
 $A + B - C = 8 \text{ h} + 80 \text{ min}$   
 =  $9\frac{1}{3} \text{ h} = \frac{28}{3} \text{ h}$

$$\begin{array}{l} \text{A} + \text{B} \quad 8 \\ \text{A} + \text{B} + \text{C} \quad \frac{28}{3} \end{array} \left. \vphantom{\begin{array}{l} \text{A} + \text{B} \\ \text{A} + \text{B} + \text{C} \end{array}} \right\} 56 \left\langle \begin{array}{l} 7 \\ - \\ 6 \\ \oplus \end{array} \right] \times 7 = 49$$

$C = \frac{49}{1} = 49 \text{ h}$