

**AJ INSTITUTE OF ENGINEERING & TECHNOLOGY**  
**DEPT. OF TRAINING & PLACEMENT**

Test-2

**WORK & WAGES, PIPES & CISTERNS**

Wednesday 8<sup>th</sup> May 2024

Q1. Ram and Shyam have been given a task of painting a house for Rs. 800. With the help of Rita, they complete the job in just 3 days. Had Ram alone be doing the task, he would need 6 days. If Shyam alone would be doing the task, he would need 8 days. How much money Rita will get?

- A) Rs. 80
- B) Rs. 150
- C) Rs. 100
- D) Rs. 125

**Answer Rs.100**

**Explanation:**

In one day, Ram does  $\frac{1}{6}$  and Shyam does  $\frac{1}{8}$  amount of work

**In one day, Ram and Shyam together do  $\frac{1}{6} + \frac{1}{8} = \frac{7}{24}$  amount of work**

Actually the work is done by Ram, Shyam and Rita in just 3 days.

**So in one day, all 3 together do  $\frac{1}{3}$  amount of work**

**So how much would be the work done by Rita in one day?**

**Work by Rita in one day =  $\frac{1}{3} - \frac{7}{24} = \frac{1}{24}$**

Job is done in 3 days, so total work by Rita (i.e. in 3 days) =  $3 \times \frac{1}{24} = \frac{1}{8}$

**Tip:** Amount of work done  $\propto$  Amount of wages earned

**Share of Rita =  $\frac{1}{8}$  of Total Amount =  $\frac{1}{8} \times 800 = \text{Rs. 100}$**

Q2. P and Q together earn Rs. 188 per day. Q and R together earn Rs. 152 per day. P, Q and R when working together earn Rs. 300 per day. How much does Q earn daily?

- A) Rs. 43
- B) Rs. 56
- C) Rs. 45
- D) Rs. 40

**ANSWER: Rs. 40**

**Explanation:**

Let daily wages of P = Rs. P; daily wages of Q = Rs. Q and daily wages of R = Rs. R

$$\therefore P + Q + R = \text{Rs. } 300$$

$$\text{Also, } P + Q = \text{Rs. } 188 \rightarrow (1)$$

$$\text{And, } Q + R = \text{Rs. } 152 \rightarrow (2)$$

**Adding equations (1) and (2)**

$$P + Q + Q + R = 188 + 152$$

$$\therefore Q + P + Q + R = 340$$

Substituting value of  $P + Q + R$ , we get,

$$Q + 300 = 340$$

$$\therefore Q = \text{Rs. } 40 = Q \text{ earns this much per day}$$

Q3. What will be share of Rajesh, if together Ramesh and Suresh complete only  $\frac{7}{11}$  of the task, and all three had been given the contract to finish the task for Rs. 1100?

- A) Rs. 350( $\frac{4}{11}$ )
- B) Rs. 200
- C) Rs. 400
- D) Rs. 650

**ANSWER: Rs. 400**

**Explanation:**

Ramesh and Suresh complete  $\frac{7}{11}$  of the task

$$\text{Remaining task} = 1 - \frac{7}{11} = \frac{4}{11}$$

This is done by Rajesh. If work done is  $\frac{4}{11}$ th, share in wages will also be  $\frac{4}{11}$ th.

$$\therefore \text{Share of Rajesh} = \frac{4}{11} \text{th of Rs. } 1100 = \frac{4 \times 1100}{11} = \text{Rs. } 400$$

Q4. P and Q work together on a task for 5 days. They then leave and rest of the task is done by R in just 2 days. All the three together are paid Rs. 450. What will be

R's share out of the payment if P alone could do the task in 10 days and Q alone can do the task alone in 15 days?

- A) Rs. 100
- B) Rs. 75
- C) Rs. 225
- D) Rs. 50

**ANSWER: Rs. 75**

**Explanation:**

In one day, P does  $\frac{1}{10}$  amount of work

In one day, Q does  $\frac{1}{15}$  amount of work

**In one day, P and Q together do  $\frac{1}{10} + \frac{1}{15} = \frac{5}{30} = \frac{1}{6}$  amount of work**

They work together for 5 days, so they complete  $5 \times \frac{1}{6} = \frac{5}{6}$  amount of work.

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

This is done by R. If work done is  $\frac{1}{6}$ th, share in wages will also be  $\frac{1}{6}$ th.

**$\therefore$  Share of R** =  $\frac{1}{6}$  th of Rs. 450 =  $\frac{450}{6} = \text{Rs. 75}$

Q5. Johnny employs 8 workers to work for 6 hours per day. In total he pays them Rs. 630 for a week. How much should Johnny pay 18 workers working 4 hours per day for a week?

- A) Rs. 945
- B) Rs. 645
- C) Rs. 630
- D) Rs. 1050

**ANSWER: Rs. 945**

**Explanation:**

6 hours per day for a week means  $6 \times 7 = 42$  hours.

8 workers for 42 hours get Rs. 630

$\therefore$  8 workers for 1 hour get  $630/42 = \text{Rs. 15}$

1 worker for 1 hour gets Rs.  $\frac{15}{8}$

So 18 workers for 1 hour will get  $18 \times \frac{15}{8} = \text{Rs. } \frac{135}{4}$

Now, these 18 workers work for 4 hours per day for 1 week =  $4 \times 7 = 28$  hours

18 workers for 28 hours will get  $28 \times \frac{135}{4} = \text{Rs. 945}$

Q6. Wages of 44 women for 56 days comes to Rs.29568. How many men are needed for 47 days to receive Rs. 16920, if the daily wages of a man being 5 times those of a woman?

- A) 9 men
- B) 8 men
- C) 6 men
- D) 5 men

**ANSWER: 6 men**

**Explanation:**

$$1 \text{ day wage of 44 women} = \frac{\text{Rs.}29568}{56 \text{ days}}$$

$$1 \text{ day wage of 1 woman} = \frac{29568}{56 \text{ days} \times 44 \text{ women}} = \text{Rs. } 12$$

$$1 \text{ day wage of 1 man} = 5 \times 12 = \text{Rs. } 60$$

Using above concept,

$$1 \text{ day wage of 1 man} = \frac{\text{Rs.}16920}{47 \text{ days} \times \text{Number of Men}} = \text{Rs. } 60$$

$$\therefore \text{Number of men} = \frac{16920}{47 \times 60} = 6 \text{ men}$$

Q7. P, Q and R get Rs.1105 for doing a job together. While working alone, P, Q and R need 7 days, 8 days and 11 days respectively to complete the job. Then what would be the share of each?

- A) P = Rs. 440; Q = Rs. 385; R = Rs. 280
- B) P = Rs. 500; Q = Rs. 400; R = Rs. 205
- C) P = Rs. 445; Q = Rs. 375; R = Rs. 285
- D) P = Rs. 446; Q = Rs. 381; R = Rs. 278

**ANSWER: P = Rs. 440; Q = Rs. 385; R = Rs. 280**

**Explanation:**

P takes 7 days; Q takes 8 days and R takes 11 days to complete the job

Ratio of days taken is **P:Q:R = 7:8:11**

**Tip:**

**If ratio of time taken is a : b : c, then share of income is in ratio**

**bc : ac : ca**

**Easy way to remember –**

Share of 'a' will only have 'bc' and not 'a'

Share of 'b' will only have 'ac' and not 'b'

Hence, Ratio of income share is

$$\text{Income of P : Income of Q : Income of R} = 8 \times 11 : 7 \times 11 : 7 \times 8 = 88 : 77 : 56$$

$$\text{Share of P} = \frac{88}{88+77+56} \times \text{Total Amount} = \frac{88}{221} \times 1105 = \text{Rs. 440}$$

$$\text{Share of Q} = \frac{77}{221} \times 1105 = \text{Rs. 385}$$

$$\text{Share of R} = \frac{56}{221} \times 1105 = \text{Rs. 280}$$

Q8. Parthiv was appointed for a 100 days job. The condition was that he will be paid Rs. 24 for every working day. But he will also be fined Rs.12 for every day he is absent. At the end he got Rs.420. For how many days, he was absent?

- A) 45 Days
- B) 55 Days
- C) 75 Days
- D) 64 Days

**ANSWER: 55 Days**

**Explanation:**

Let Parthiv be absent for K days.

So, he worked for (100-K) days and got Rs. 420

He was fined for K days hence, his fine = Rs. 12 x K = 12K

$$\therefore 420 = (100-K) \times \text{Rs. 24} - 12K$$

$$\therefore 420 = 2400 - 24K - 12K$$

$$\therefore K = 55 = \text{Parthiv was absent for these many days}$$

Q9. Ramesh can do a work in 5 days. Suresh can do the same work in 7 days. The total amount given for this work to them is Rs. 480. If both are working together, then what will be the share of Suresh?

- A) Rs. 180
- B) Rs. 300
- C) Rs. 280
- D) Rs. 200

**ANSWER: Rs. 200**

**Explanation:**

**Tip:**

$$\text{Share of Income} \propto \frac{1}{\text{Number of days OR Time taken}}$$

**$\therefore$  If ratio of time taken is  $a : b$  or  $\frac{a}{b}$ , then share of income is  $b : a$  or  $\frac{b}{a}$**

Ramesh can do a work in 5 days and Suresh in 7 days.

Ratio of days of Ramesh to Suresh = 5:7

So their **share of income will be  $\rightarrow$  Ramesh's Income: Suresh's income = 7:5**

$$\therefore \text{Suresh's income} = \frac{5}{5+7} \times 480 = \text{Rs. 200}$$

Q10. A man and a boy received Rs. 1800 as wages for 3 days for a job they did together. The man's efficiency in the work was 5 times that of the boy. What is the daily wages of the boy?

A) Rs. 100

B) Rs. 500

C) Rs. 300

D) Rs. 900

**ANSWER: Rs. 100**

**Explanation:**

$$\text{Wages for 1 day for both} = \frac{\text{Rs. 1800}}{3} = \text{Rs. 600}$$

Man is 5 times more efficient than boy, so he does 5 times more work than the boy.

**If you work more you get proportionately more money**

So man gets 5 times more money than boy.

**$\therefore$  Ratio of wages of 1 day of man to wages of 1 day of boy is 5:1**

$$\begin{aligned} \text{Daily wage of boy} &= \frac{1}{5+1} \times \text{Wages for 1 day for both} \\ &= \frac{1}{6} \times 600 = \text{Rs. 100} \end{aligned}$$

Q11. P can do a job in 30 days, while Q alone can do it in 45 days. They work together for 15 days and rest of the job is done by R in 6 days. They get Rs.15000 for the whole job. What will be R's share?



- A) Rs. 5000
- B) Rs. 2500
- C) Rs. 7500
- D) Rs. 1500

**ANSWER: Rs. 2500**

**Explanation:**

$$\text{Total work of P} = 1 \text{ day work of P} \times 15 \text{ days} = \frac{1}{30} \times 15 = \frac{1}{2}$$

$$\text{Total work of Q} = \frac{1}{45} \times 15 = \frac{1}{3}$$

$$\therefore \text{Total work done by P and Q} = \frac{1}{2} + \frac{1}{3} = \frac{5}{6}$$

$$\text{Remaining work} = 1 - \frac{5}{6} = \frac{1}{6} \text{ This is done by R}$$

$$\text{Share of R} = \text{Total work done by R} \times \text{Total Amount} = \frac{1}{6} \times 15000 = \text{Rs. 2500}$$

Q12. A man and a boy received Rs. 1800 as wages for 3 days for a job they did together. The man's efficiency in the work was 5 times that of the boy. What is the daily wages of the boy?

- A) Rs. 100
- B) Rs. 500
- C) Rs. 300
- D) Rs. 900

**ANSWER: Rs. 100**

**Explanation:**

$$\text{Wages for 1 day for both} = \frac{\text{Rs. 1800}}{3} = \text{Rs. 600}$$

Man is 5 times more efficient than boy, so he does 5 times more work than the boy.

**If you work more you get proportionately more money**

So man gets 5 times more money than boy.

**$\therefore$  Ratio of wages of 1 day of man to wages of 1 day of boy is 5:1**

$$\begin{aligned} \text{Daily wage of boy} &= \frac{1}{5+1} \times \text{Wages for 1 day for both} \\ &= \frac{1}{6} \times 600 = \text{Rs. 100} \end{aligned}$$

Q13. P, Q and R take a job for Rs. 640. P and Q together finish  $\frac{2}{5}$ th of the work and rest is done by R alone. What is the share of R?

- A) Rs. 256
- B) Rs. 420
- C) Rs. 340
- D) Rs. 384

**ANSWER: Rs. 384**

**Explanation:**

P and Q finish  $\frac{2}{5}$ th of the work so remaining work  $= 1 - \frac{2}{5} = \frac{3}{5}$

C does  $\frac{3}{5}$ th of the work so **share of C in income**  $= \frac{3}{5} \times 640 = \text{Rs. 384}$

Q14. A and B took a job for Rs. 7200. A alone can do it in 12 days. B alone can do it in 16 days. They completed the work in 6 days with the help of C. Find the share of C?

- A) Rs. 1200
- B) Rs. 900
- C) Rs. 800
- D) Rs. 600

**ANSWER: Rs. 900**

**Explanation:**

1 day work of A  $= \frac{1}{12}$ ; 1 day work of B  $= \frac{1}{16}$

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

$\therefore$  1 day work of C  $= \frac{1}{6} - \left( \frac{1}{12} + \frac{1}{16} \right) = \frac{1}{48}$

**Ratio of 1 day work of A, B and C**  $= \frac{1}{12} : \frac{1}{16} : \frac{1}{48} = 4 : 3 : 1 \longrightarrow$  Multiplied by 48

**If you work more you get proportionately more money**

$\therefore$  Share of income of A, B and C is also in ratio 4:3:1 respectively.

**Share of C**  $= \frac{1}{4+3+1} \times \text{Total Amount} = \frac{1}{8} \times 7200 = \text{Rs. 900}$

Q15. Ramesh can do a work in 15 days. Vijay and Ramesh together do the same work in 10 days. They received Rs. 1155 for that work. What is share of Ramesh and Vijay?



A) Ramesh = Rs. 770; Vijay = Rs. 385

B) Ramesh = Rs. 605; Vijay = Rs. 550

C) Ramesh = Rs. 550; Vijay = Rs. 605

D) Ramesh = Rs. 385; Vijay = Rs. 770

**ANSWER: Ramesh = Rs. 770; Vijay = Rs. 385**

**Explanation:**

$$\text{Ramesh's 1 day work} = \frac{1}{15}$$

$$(\text{Ramesh} + \text{Vijay})'s \text{ 1 day work} = \frac{1}{10} = 1 \text{ day work of Ramesh} + 1 \text{ day work of Vijay}$$

$$\therefore 1 \text{ day work of Vijay} = \frac{1}{10} - \frac{1}{15} = \frac{1}{30}$$

$$\text{Ratio of 1 day work of Ramesh and Vijay is given by Ramesh : Vijay} = \frac{1}{15} : \frac{1}{30} = 2:1$$

**If you work more you get proportionately more money**

$$\therefore \text{Share of Ramesh : Share of Vijay} = 2 : 1$$

$$\text{Share of Ramesh} = \frac{2}{2+1} \times \text{Total Amount} = \frac{2}{3} \times 1155 = \text{Rs. 770}$$

$$\text{Share of Vijay} = \frac{1}{3} \times 1155 = \text{Rs. 385}$$

Q16. Two pipes A & B can fill the tank in 12 hours and 36 hours respectively. If both the pipes are opened simultaneously, how much time will be required to fill the tank?

A) 6 hours

B) 9 hours

C) 12 hours

D) 15 hours

**Answer: B**

If a pipe requires 'x' hrs to fill up the tank, then part filled in 1 hr =  $\frac{1}{x}$

If pipe A requires 12 hrs to fill the tank, then part filled by pipe A in 1 hr =  $1/12$

If pipe B requires 36 hrs to fill the tank, then part filled by pipe B 1 hr =  $1/36$

Hence, part filled by (A + B) together in 1 hr =  $1/12 + 1/36$

$$= 48 / 432 = 1/9$$

In 1 hr both pipes together fill  $1/9$ th part of the tank. This means, together they fill the tank in 9 hrs.

Q17. Two pipes can fill a tank in 10 and 14 minutes respectively and a waste pipe can empty 4 gallons per minute. If all the pipes working together can fill the tank in 6 minutes, what is the capacity of the tank?

- A) 120 gallons
- B) 240 gallons
- C) 450 gallons
- D) 840 gallons

**Answer: D**

$$\begin{aligned} \text{Work done by waste pipe in 1 min} &= (\text{Part filled by total pipes together}) - (\text{part filled by first pipe} + \text{part filled by second pipe}) \\ &= \frac{1}{6} - \left[ \left( \frac{1}{10} \right) + \left( \frac{1}{14} \right) \right] = \frac{1}{6} - \left( \frac{24}{140} \right) = -\frac{1}{210} \end{aligned}$$

Here, negative (-) sign indicates emptying of tank.

To find the capacity, we need to determine the volume of  $\frac{1}{210}$  part.

Therefore, volume of  $\frac{1}{210}$  part = 4 gallons -----(given condition)

Hence, the capacity of tank = volume of whole =  $4 \times 210 = 840$  gallons.

Q18. A pipe can fill a tank in 6 hours and another pipe can empty the tank in 12 hours. If both the pipes are opened at the same time, the tank can be filled in.

- A) 10 hours
- B) 12 hours
- C) 14 hours
- D) 16 hours

**Answer: B**

$$\text{Part of the tank filled in one hour} = \frac{1}{6}$$

$$\text{Part of the tank emptied in one hour} = \frac{1}{12}$$

Net part of the tank filled in one hour;

$$\begin{aligned} &= \frac{1}{6} - \frac{1}{12} \\ &= \frac{2-1}{12} = \frac{1}{12} \end{aligned}$$

$$\frac{1}{12} \text{ Part of the tank can be filled in one hour.}$$

∴ The tank will be filled completely in 12 hours.

Q19. Three pipes A, B and C can fill a cistern in 8 minutes, 12 minutes and 16 minutes respectively. What is the time taken by three pipes to fill the cistern when they are opened together?

A) 3.7 minutes

B) 4 minutes

C) 4.5 minutes

D) 5 minutes

**Answer : A**

$$\text{Part of the tank filled by A in one minute} = \frac{1}{8}$$

$$\text{Part of the tank filled by B in one minute} = \frac{1}{12}$$

$$\text{Part of the tank filled by C in one minute} = \frac{1}{16}$$

Net part of the tank filled by A+B+C in one minute;

$$= \frac{1}{8} + \frac{1}{12} + \frac{1}{16}$$

$$= \frac{6 + 4 + 3}{48} = \frac{13}{48}$$

$$\frac{13}{48} \text{ Part of the cistern is filled in one minute.}$$

$$\therefore \text{The whole tank will be filled in } \frac{48}{13} = 3.7 \text{ minutes}$$

Q20. Two pipes can fill a tank in 6 hours and 8 hours respectively. A third pipe can empty the same tank in 12 hours. If all the pipes start working together, how long it will take to fill the tank?

A) 4 hours

B) 4.5 hours

C) 4.8 hours

D) 5.2 hours

**Answer: C**

Part of the tank filled by two pipes in one hour =  $\frac{1}{6} + \frac{1}{8}$

Part of the tank emptied by the third pipe in one hour =  $\frac{1}{12}$

$\therefore$  Net part of the tank filled in one hour =  $\frac{1}{6} + \frac{1}{8} - \frac{1}{12}$

$$= \frac{4 + 3 - 2}{24} = \frac{5}{24}$$

$\frac{5}{24}$  Part of tank can be filled in one hour

$\therefore$  The whole tank will be filled in  $\frac{24}{5} = 4.8$  hours

Q21. A cistern can be filled by an inlet in 6 hours and can be emptied by an outlet in 8 hours. If the inlet and outlet are opened together, in what time the cistern can be filled?

A) 24 hours

B) 26 hours

C) 20 hours

D) 18 hours

**Answer: A**

Part of the tank filled by the inlet in one hour =  $\frac{1}{6}$

Part of the tank emptied by the outlet in one hour =  $\frac{1}{8}$

Net part of the tank filled in one hour =  $\frac{1}{6} - \frac{1}{8}$

$$= \frac{8-6}{48} = \frac{1}{24}$$

$\frac{1}{24}$  part of the tank is filled in one hour

$\therefore$  The whole tank will be filled in 24 hours.

Q22. 20 buckets can fill a tank when the capacity of each bucket is 12 liters. If the capacity of each bucket is 10 liters, find the number of buckets required to fill the tank.

A) 30 buckets

B) 34 buckets

C) 24 buckets

D) 27 buckets

**Answer: C**

Capacity of each bucket = 12 liters

20 buckets can fill the tank. So, capacity of tank =  $20 * 12 = 240$  liters

New capacity of bucket = 10 liters

So, 10 liters can be poured into the tank by one bucket

**240 liters will be poured by  $\frac{1}{10} * 240 = 24$  buckets**

Q23. Two pipes working together can fill a fish tank in 12 minutes. If one pipe fills the fish tank 10 minutes faster than the second pipe, in what time the second pipe alone can fill the fish tank?

A) 20 minutes

B) 25 minutes

C) 30 minutes

D) 35 minutes

**Answer: C**

Let the first pipe fill the reservoir in X minutes

So, the second pipe will fill the reservoir in (X+10) minutes

As per question;

$$\frac{1}{X} + \frac{1}{X+10} = \frac{1}{12}$$

$$\frac{X+10+X}{X(X+10)} = \frac{1}{12}$$

$$12X + 120 + 12X = X^2 + 10X$$

$$X^2 + 10X - 24X - 120 = 0$$

$$X^2 - 14X - 120 = 0$$

$$X^2 - 20X + 6X - 120 = 0$$

$$X(X-20) + 6(X-20) = 0$$

$$(X+6)(X-20) = 0$$

$$X = 20$$

∴ Second pipe will fill the reservoir in  $20 + 10 = 30$  minutes

Q24. Pipe A can fill a tank in 12 minutes whereas pipe A along with pipe B can fill the same tank in 8 minutes. In what time pipe B alone can fill the tank?

- A) 24 minutes
- B) 20 minutes
- C) 25 minutes
- D) 22 minutes

**Answer: A**

Part of the tank filled by pipe A in one minute =  $\frac{1}{12}$

Part of the tank filled by A+B in one minute =  $\frac{1}{8}$

Part of the tank filled by B alone =  $\frac{1}{8} - \frac{1}{12} = \frac{1}{24}$

**Pipe B can fill  $\frac{1}{24}$  part of the tank in one minute.**

∴ Pipe B will fill the whole tank in 24 minutes.

Q25. 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

**Answer: C**

**Explanation:**

Work done by the waste pipe in 1 minute =  $\frac{1}{15} - \left( \frac{1}{20} + \frac{1}{24} \right)$

$$= \left( \frac{1}{15} - \frac{11}{120} \right)$$

$$= -\frac{1}{40} \quad [-ve \text{ sign means emptying}]$$

∴ Volume of  $\frac{1}{40}$  part = 3 gallons.

Volume of whole =  $(3 \times 40)$  gallons = 120 gallons.



Q26. 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

**Answer: 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.

$$\therefore \frac{1}{x} + \frac{2}{x} + \frac{4}{x} = \frac{1}{5}$$

$$\Rightarrow \frac{7}{x} = \frac{1}{5}$$

$$\Rightarrow x = 35 \text{ hrs.}$$

Q27. 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

**Answer: C**

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

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

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

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

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

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

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

Q28. 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 will it take to fill the tank?

- A) 12 min
- B) 15 min
- C) 25 min
- D) 50 min

**Answer: A**

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

$$\text{Part filled by B in 1 min} = \frac{1}{30}.$$

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

∴ Both pipes can fill the tank in 12 minutes.

Q29. 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) 81 min.
- B) 108 min.
- C) 144 min.
- D) 192 min.

**Answer: C**

Let the slower pipe alone fill the tank in  $x$  minutes.

Then, faster pipe will fill it in  $\frac{x}{3}$  minutes.

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

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

$$\Rightarrow x = 144 \text{ min.}$$

Q30. A large tanker 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 tanker from empty state if B is used for half the time and A and B fill it together for the other half?

- A) 15 min
- B) 20 min
- C) 27.5 min
- D) 30 min

**Answer: D**

$$\text{Part filled by (A + B) in 1 minute} = \left( \frac{1}{60} + \frac{1}{40} \right) = \frac{1}{24}.$$

Suppose the tank is filled in  $x$  minutes.

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

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

$$\Rightarrow x = 30 \text{ min.}$$