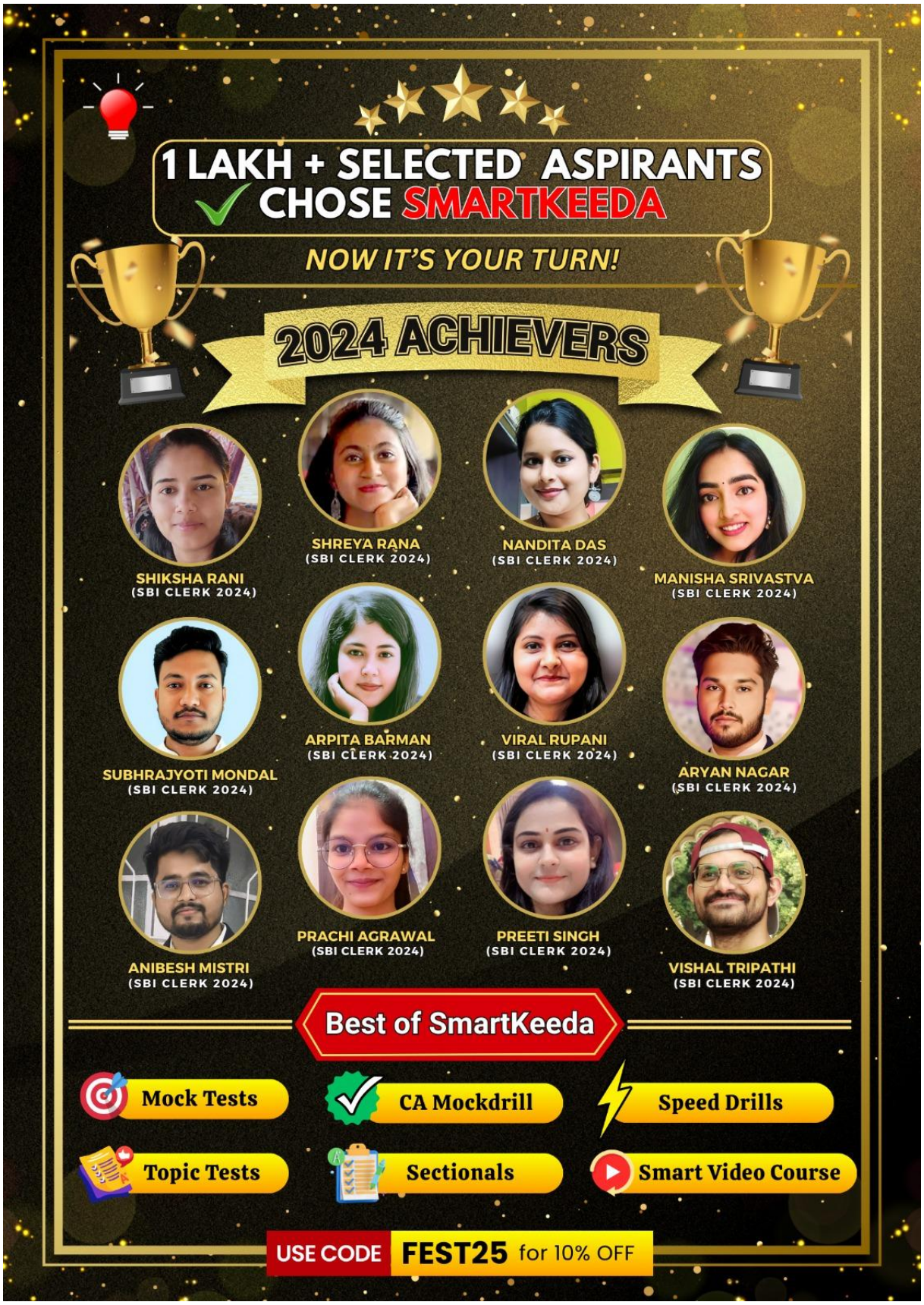
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Pipe and Cistern Questions for IBPS RRB Office Assistant (Mains), IBPS RRB Scale - I (Mains), IBPS Clerk (Mains) and IBPS PO (Mains) Exams.

Pipe and Cistern Quiz 1

Directions : Read the following questions carefully and choose the right answer.

1. There are three taps namely A, B, and C are connected to a tank. Tap A can fill a tank in 16 hours and tap C can empty it in 40 hours. Tap A and B is opened to fill the tank with tap C to empty it. The tap is completely filled in 20 hours. In what time tap B can fill the tank completely if opened alone?

A. 60 hours B. 80 hours C. 48 hours D. 72 hours E. None of these

2. Three taps A, B and C are allowed to fill an empty tank. The three taps together can fill it in 2T hours. If all the taps fill it for T hours, and then tap B is closed, then the time needed now is 2(2/3) hours more if tap B was not closed. If tap A and B fill same volume of water in a given time and C is half efficient than A, then find the value of T.

A. 3 B. 4 C. 6 D. 8 E. 10

3. A tap is connected to an empty tank. If the tap is open, in first 20 minutes, the tank is filled 20%. If the tap gives 3 litres per minutes, find in what time the tank will be filled 240 litres.

A. 40 minutes B. 60 minutes C. 75 minutes D. 80 minutes E. 100 minutes

4. A tap can fill a cylindrical tank of radius 21 cm in 36 minutes. In how many minutes can it fill a tank with radius 33.33% less than the radius of the above tank and same height?

A. 12 B. 16 C. 18 D. 24 E. 28

5. Tap-A can fill 20 liters water in 8 minutes. 60% of what tap-A can fill in 20 minutes can be filled by Tap-B in half an hour. If both the taps are opened to fill a bucket of 70 liters, then in what time the bucket will be filled completely?

A. 16 minutes B. 20 minutes C. 24 minutes D. 30 minutes E. 32 minutes

6. **There was a tank named 'A' full of water with a tap connected to its bottom. A kid opens the tap for fun and the tank starts emptying. A person sees the flowing water after 10 minutes so he instantly puts another tank named B below the flowing water so that tank B is completely filled in next 35 minutes such that the tank A becomes completely empty. If the tap passed the water at constant rate, find the ratio of volume of tank A to B.**

A. 7 : 5 B. 9 : 7 C. 8 : 5 D. 9 : 5 E. Can't be determined

7. **Pipe A, B and C can be used as inlet or outlet pipes in a tank. A and C, when both used as inlet pipes, can fill the tank in 18 hours while B alone can fill the tank in 60 hours. If A is used as inlet and C as outlet, together they can fill the tank in 90 hours. In how much time (in hours) tank will be full using A and B as inlet and C as outlet pipe?**

A. 48 B. 24 C. 28 D. 36 E. 42

8. **Pipes A and C can fill a tank in 60 hours and 36 hours respectively while pipe B can empty it in 90 hours. In empty tank, A and C are opened for 12 hours then B and C are opened for 5 hours. If 276 liters of the tank is empty, what is the total capacity (in liters) of the tank?**

A. 960 B. 840 C. 480 D. 720 E. 680

9. **Three Pipes A, B, and C can fill a tank in 24 hours, 30 hours and 60 hours respectively. If Pipe A is opened all the time, Pipe B and Pipe C are opened for alternate hours starting with Pipe B, how much time will this process take to fill the tank?**

A. 12.25 hours B. 6.32 hours C. 7.75 hours D. 14.89 hours E. 9.99 hours

10. **Two taps can fill a pool in 60 minutes and 40 minutes respectively. There is an outlet tap at exactly half–level of that pool, and it can pump out 20 liters of water every second. If the outlet tap is open, it takes 36 minutes to fill the empty pool. What is the volume of the pool?**

A. 28,800 liters B. 43,200 liters C. 36,000 liters D. 57,600 liters E. None of these

Correct Answers:

1	2	3	4	5	6	7	8	9	10
B	B	D	B	B	B	D	D	D	D

Explanation:

1. Let the tap B can fill the tank alone in 'b' hours, we have

$$\frac{1}{16}+\frac{1}{b}-\frac{1}{40}=\frac{1}{20}$$

$$\frac{1}{b}=\frac{1}{20}-\frac{1}{16}+\frac{1}{40}=\frac{1}{80}$$

b = 80

Tap B will alone fill the tank in 80 hours.

Hence, option B is correct.

2. Let tap A, B and C can fill the tank in 'a', 'a', and '2a' hours respectively, then

$$\frac{1}{a}+\frac{1}{a}+\frac{1}{2a}=\frac{1}{2T}\rightarrow a=5T$$

Till time 'T' half the tank will be filled, so for next half tank to be filled, we have taps A and C.

Tap A and C together fill

$$\left(\frac{1}{5T}+\frac{1}{10T}\right)=\frac{0.3}{T}\text{ parts per hour, so}$$

$$\frac{\frac{1}{2}}{\frac{0.3}{T}}=T+\frac{8}{3}$$

T = 4

Hence, option B is correct.

3. In 20 minutes, the amount of water = 20 × 3 = 60 litres

20% ---------- > 20 minutes ------- > 60 litre

100% --------- > 100 minutes ----- > 300 litre

240 litres ----- > $\frac{240}{300} \times 100 = 80$ minutes

Hence, option D is correct.

4. Let the height of the tank be 'H' cm, then its volume

$= \frac{22}{7} \times (21)^2 \times H \text{ cm}^3$

Volume of water the tap fills each minute

$= \frac{22}{7} \times (21)^2 \times \frac{H}{36}$

Radius of second tank = 21 – 33.33% of 21 = 14 cm

Volume of second tank = $\frac{22}{7} \times (14)^2 \times H$

Time to fill this tank = $\frac{[(22/7) \times (14)^2 \times H]}{[(22/7) \times (21)^2 \times H/36]} = 16$ minutes

Hence, option B is correct.

5. Tap A can fill

8 min ---------- > 20 liter

1 min --------- > $\frac{20}{8} = 2.5$ liter

20 min ---------- > 50 liter

Tap B can fill

60% of 50 = 30 liter in 30 minutes

30 min ---------- > 30 liter

1 min -------- > $\frac{30}{30}$ = 1 liter

Volume of water by both the taps in a minute = 2.5 + 1 = 3.5 liter

Time to fill the bucket = $\frac{70}{3.5}$ = 20 minutes

Hence, option B is correct.

6. Let the tap gives V litre of water in a minute.

The tank A was emptied in 35 + 10 = 45 minutes while tank B was filled in 35 minutes, so

Volume of A = 45V litre

Volume of B = 35V litre

Ratio = 45V : 35V = 9 : 7

Hence, option B is correct.

7. Let the tank capacity be = LCM (18, 60, 90) = 180k

Eff. of B = $\frac{180k}{60}$ = 3k

Eff. of (A + C) = $\frac{180k}{18}$ = 10k

Eff. of (A – C) = $\frac{180k}{90}$ = 2k

So, Eff. of A = 6k and C = 4k

When A and B are inlet and C is outlet, net eff = 6k + 3k – 4k = 5k

Time taken to fill the tank = $\frac{180k}{5k}$ = 36 hours

Hence, option D is correct.

8. Let the tank capacity be 180p

Efficiency of A = $\frac{180p}{60}$ = 3p

C = $\frac{180p}{36}$ = 5p

B = $-\frac{180p}{90}$ = – 2p

Tank filled = (A + C) × 12 + (B + C) × 5 = (3p + 5p) × 12 + (5p – 2p) × 5 = 111p

Remaining tank capacity = 180p – 11p = 69p

69p = 276

p = 4

Total tank capacity = 180p = 180 × 4 = 720 liters

Hence, Option D is correct.

9. If we take LCM of 24, 30 and 60 as the total capacity of the tank, then

Total capacity = 120 units

Efficiency of A = $\frac{120}{24}$ = 5 units/hour

Efficiency of B = $\frac{120}{30}$ = 4 units/hour

Efficiency of C = $\frac{120}{60}$ = 2 units/hour

The tank filled in first hour = 5 + 4 = 9 units

The tank filled in second hour = 5 + 2 = 7 units

In 2 hours work done = 9 + 7 = 16 units

$16 \times 7 = 112$

In 14 hours work done = 112 units

Remaining work = 120 – 112 units

Now A and B will fill together

So the answer = $14 + \frac{8}{9}$ = 14.89 hours

Hence, Option D is correct.

10. Had there been no outlet pipe,

Both the inlet pipes would take

= $\frac{(60 \times 40)}{(60 + 40)}$ = 24 minutes to fill the tank

Half tank in 12 minutes.

Now,

Since there is an outlet pipe because of that, it take (36 – 12) minutes in place of (24 – 12) minutes.

(36 – 12) : (24 – 12) = 24 : 12 = 2 : 1

Efficiency reduces from 2 to 1.

It means Efficiency of inlet pipes = 2 units

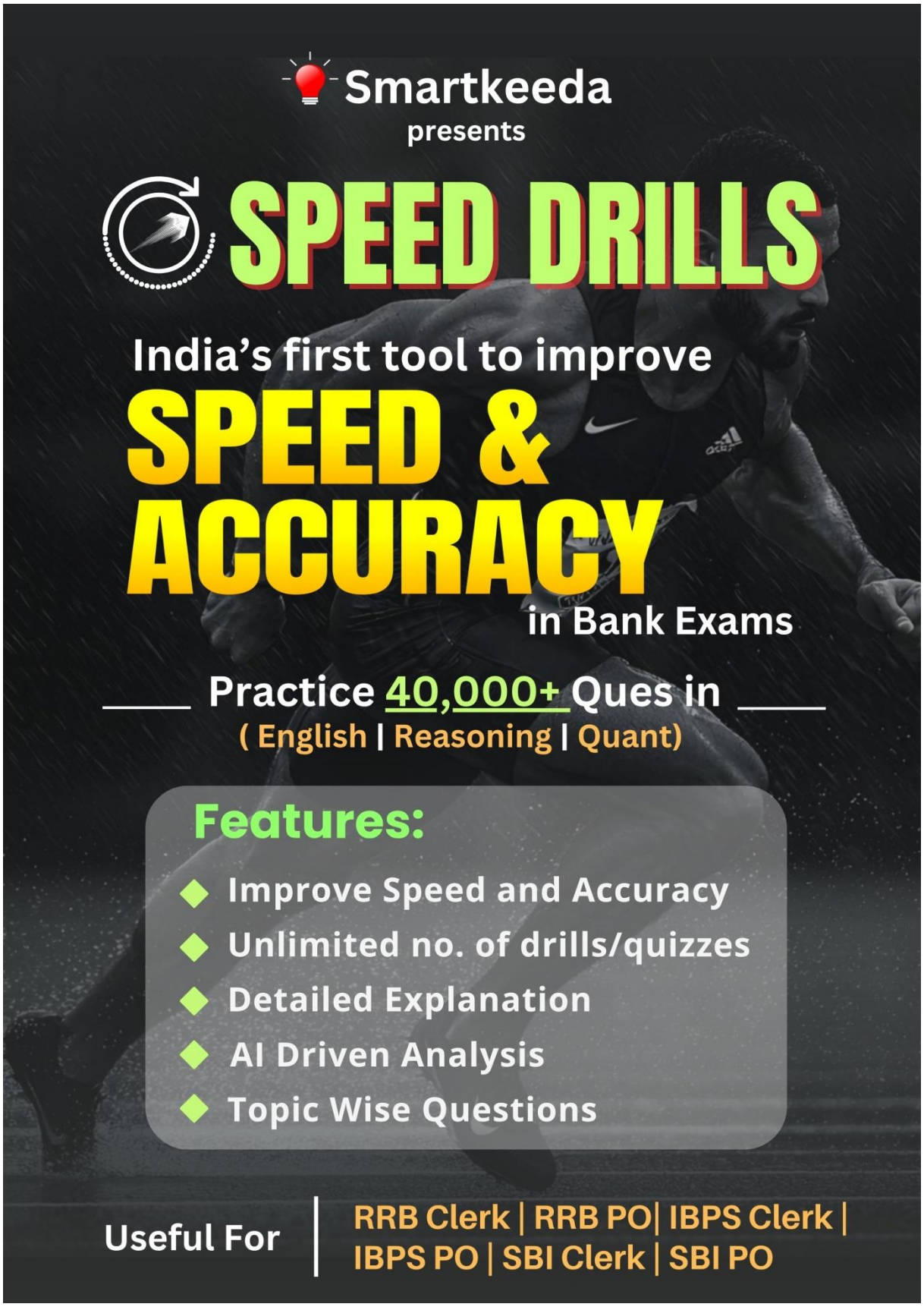
And the efficiency of outlet pipe = 1 units

Had the outlet pipe been in the bottom,

It will take = $\frac{24 \times 2}{1}$ = 48 minutes to empty the tank.

So the answer = $48 \times 20 \times 60$ = 57,600 litres

Hence, Option D is correct.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