

IPMAT SAMPLE PAPER & QUESTIONS (TIME & WORK)

Q1. In Darbhanga village, 12 men and 18 boys completed construction of a primary health centre in 60 days, by working for 7.5 hours a day. Subsequently the residents of the neighbouring Kharbhanga village also decided to construct a primary health centre in their locality, which would be twice the size of the facility built in Darbhanga. If a man is able to perform the work equal to the same done by 2 boys, then how many boys will be required to help 21 men to complete the work in Kharbhanga in 50 days, working 9 hours a day? c) 40 boys a) 45 boys

b) 48 boys

d) 42 boys

Q2. A contract is to be completed in 56 days and 104 men are set to work, each working 8 hours a day. After 30 days, 2/5th of the work is finished. How many additional men may be employed so that work may be completed on time, each man now working 9 hours per day? a) 56 men c) 46 men d) None of the above

b) 65 men			

Q3. 12 men can complete a work in ten days. 20 women can complete the same work in twelve days. 8 men and 4 women started working and after nine days 10 more women joined them. How many days will they now take to complete the remaining work?

a) 2 days	c) 8 days
b) 5 days	d) 10 days

Q4. A crew can row 10 miles in 5/6th of an hour down-stream and 12 miles upstream in 90 minutes. Find the current's rate and crew's rate in still water.

a) 12 mph <i>,</i> 4 mph	c) 8 mph <i>,</i> 4 mph
b) 10 mph, 2 mph	d) 12 mph, 2 mph

Q5. It takes 6 hours for pump A, used alone, to fill a tank of water. Pump B used alone takes 8 hours to fill the same tank. A, B and another pump C all together fill the tank in 2 hours. How long would pump C take, used alone, to fill the tank?

a) 4.8	c) 5.6
b) 6	d) 3

Q6. A swimming pool can be filled by pipe A in 3 hours and by pipe B in 6 hours, each pump working on its own. At 9 am, pump A is started. At what time will the swimming pool be filled if pump B is started at 10 am?

a) 11:20 a.m.

b) 11:05 a.m.

c) 11:10 a.m.

d) 10:50 a.m.



Q7. Stuart, Jack and Leo are colleagues working in a plant. Stuart and Jack can do a work in 10 days, Jack and Leo can do the same work in 15 days while Stuart and Leo can do it in 12 days. All of them started the work together. After two days, Leo was shifted to some other work. How many days will Stuart and Jack take to finish the rest of the work?

a) 9	c) 8
b) 12	d) 7.5

Q8. Four men and three women can do a job in 6 days. When 5 men and 6 women work on the same job, the work gets completed in 4 days. How long will 2 women and 3 men take to do the job?

a) 18	c) 8.3
b) 10	d) 12

Q9. B is twice efficient as A and A can do a piece of work in 15 days. A started the work and after a few days B joined him. They completed the work in 11 days, from the starting. For how many days did they work together?

a) 1 day	c) 6 days
b) 2 days	d) 5 days

Q10. Ram completes 60% of a task in 15 days and then takes the help of Rahim and Rachel. Rahim is 50% as efficient as Ram is and Rachel is 50% as efficient as Rahim is. In how many more days will they complete the work?

a) 121/3	c) 40/7
b) 51/7	d) 65/7

Q11. Amit can do a work in 12 days and Sagar in 15 days. If they work on it together for 4 days, then the fraction of the work that is left is:

a) 3/20	c) 2/5
b) 3/5	d) 2/20

Q12. A and B can do a piece of work in 21 and 24 days respectively. They start the work together and after some days A leaves the work and B completes the remaining work in 9 days. After how many days did A leave?

a) 5	c) 8
b) 7	d) 6

Q13. A and B together can complete a task in 20 days. B and C together can complete the same task in 30 days. A and C together can complete the same task in 40 days. What is the respective ratio of the number of days taken by A when completing the same task alone to the number of days taken by C when completing the same task alone?

	-	-	-	-
a) 2 : 5				c) 3 : 7
b) 2 : 7				d) 1 : 5

Q14. A certain number of people were supposed to complete a work in 24 days. The work, however, took 32 days, since 9 people were absent throughout. How many people were supposed to be working originally?

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b) 27	d) 30
a) 32	c) 36



Q15. 8 men and 4 women together can complete a piece of work in 6 days. The work done by a man in one day is double the work done by a woman in one day. If 8 men and 4 women started working and after 2 days 4 men left and 4 new women joined, in how many more days will the work be completed?

a) 5 days	c) 6 days
b) 8 days	d) 4 days

Q16. A ship, 40 km from the shore, springs a leak which admits 3 3/4 tonnes of water in 15 min. 60 tonnes would suffice to sink her, but the ship's pumps can throw out 12 tonnes of water in one hour. Find the average rate of sailing, so that it may reach the shore just as it begins to sink.

a) 1(1/2)km/h	c) 3(1/2) km/h
b) 2(1/2) km/h	d) 2 km/h

Q17. A boat goes 30 km upstream and 44 km downstream in 10 hours. In 13 hours, it can go 40 km upstream and 55 km down-stream. The speed of the boat in still water is: (IIFT 2008)

a) 3 km/hour	c) 8 km/hour
b) 4 km/hour	d) None of the above

Q18. Three pipes A, B and C are connected to a tank. These pipes can fill the tank separately in 5 hours, 10 hours and 15 hours respectively. When all the three pipes were opened simultaneously, it was observed that pipes A and B were supplying water at 3/4th of their normal rates for the first hour after which they supplied water at the normal rate. Pipe C supplied water at 2/3rd of its normal rate for first 2 hours, after which it supplied at its normal rate. In how much time, tank would be filled.

a) 1.05 Hours b) 2.05 Hours c) 3.05 Hours d) None of these

Answer Key & Explanation:

1. Correct Answer: D Solution:

1 men = 2 Boys 12 men = 24 Boys So 12 men + 18 boys are equivalent to 24 Boys + 18 Boys = 42 Boys So in Second Case total number of boys required to do the twice of Work = 42 60 7.5 2 84 50 9 1 So 21 Men i.e 21 × 2 = 42 Boys should be assisted by 84 – 42 = 42 Boys.

2. Correct Answer: A Solution:

ATQ 104 men $\rightarrow @$ 8hr/day $\rightarrow 30$ days $\rightarrow \frac{2}{5}$ the work x Men $\rightarrow @$ 9hr/day $\rightarrow 26$ day $\rightarrow \frac{3}{5}$ th work 8 30 3

$$x = 104 \times \frac{\times}{9} \frac{\times}{26} = \frac{160 \text{ Men}}{2}$$

Additional Men Required = $160 - 104 = 56 \text{ Men}$

 Correct Answer: A
 Solution:
 Comparing efficiencies of Man and Woman, we get

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 $12M \times 10 = 20W \times 12 \Longrightarrow 1M = 2W$ Thus, 8M = 16W.

Therefore, initial persons working are equivalent to 20 women and these 20 women can complete 3/4th work in 9 days.

Thus, 1/4th work (of 3 days) is now remaining. When 10 more women will join, total women will be 30 and hence they can complete the remaining 1/4th work in 2 days.

4. Correct Answer: D Solution:

Downstream speed = 12 m/hr. Upstream speed = 8 m/hr. Current's speed = (12 - 8)/2 = 2 m/hr.

5. Correct Answer: A

Solution:

In 1 hour, pump A and B can fill 1/6 and 1/8 of the tank respectively.

If C fills 1/x of the tank in 1 hour,

$$\Rightarrow$$
 1/6 + 1/8+ 1/x = $\frac{1}{2}$

: Hence, option a

6. Correct Answer: A

Solution:

Pipe A can fill the pool in 3 hours and pipe B can fill the pool in 6 hours.

Pump A starts at 9 am and B starts at 10 am.

A alone fills for 1 hour. Let A and B together fill for n hours after 10 am. Then

1/3 + n(1/3 + 1/6) = 1

N- 4/3 hours = 1 hour and 20 minutes

Hence, pool will be filled by 11:20 am Hence, option A.

7. Correct Answer: D Solution:

Let Stuart finish the work in s days, Jack in j days and Leo in l days.

$$\begin{aligned} &\frac{1}{s} + \frac{1}{j} = \frac{1}{10} \\ &\frac{1}{j} + \frac{1}{l} = \frac{1}{15} \\ &\frac{1}{s} + \frac{1}{l} = \frac{1}{12} \\ &\therefore 2\left(\frac{1}{s} + \frac{1}{j} + \frac{1}{l}\right) = \frac{1}{10} + \frac{1}{15} + \frac{1}{12} = \frac{(6+4+5)}{60} = \frac{1}{4} \\ &\therefore \frac{1}{s} + \frac{1}{j} + \frac{1}{l} = \frac{1}{8} \end{aligned}$$

 \therefore Together they can finish $\frac{1}{8}$ th of work in one day.

For two days they worked together, after which Leo was shifted to some other work.

Let Stuart and Jack take *n* days to finish the remaining work.

$$\therefore 2 \times \frac{1}{8} + n\left(\frac{1}{10}\right) = 1$$

∴ n = 7.5 days
Hence, option 4.

8. Correct Answer: C

Solution:

Let a man take *m* days and a woman takes *w* days to complete the work. Hence, we have,

$$\frac{4}{m} + \frac{3}{w} = \frac{1}{6} \qquad \dots (I)$$
$$\frac{5}{m} + \frac{6}{w} = \frac{1}{4} \qquad \dots (II)$$

Solving I and II, we get, m = 36 and w = 54Hence, 2 women and 3 men will complete; 2/54 + 3/36 = 13/108Hence, they will complete the work in 108/13 = 8.3days Hence, **option 3**.

9. Correct Answer: B
Solution:
A can do a piece of work in 15 days.
B is twice as efficient as A.
So B can do the same piece of work in 7.5 days.



Assume that there is 15 units or work to be done. A does 1 unit per day and B does 2 units per day.

For the first x days, A worked alone and hence work done per day is $1 \times x = x$ units. For the next (11 - x) days, A and B worked together.

In 1 day, they do (1 + 2) = 3 units. So in 11 - x days, they do 33 - 3x units. 33 - 3x + x = 15 Thus 2x = 18 and x = 9. Thus A worked alone for 9 days the A and B worked together for 2 days. Hence, option B.

10. Correct Answer: C **Solution:**

Ram completes 60% of the work in 15 days. Hence, he will take 25 days to complete the work. Now, Rahim is 50% as efficient as Ram, and Rachel is 50% as efficient as Rahim, hence Ram, Rahim and Rachel together will complete;

 $\frac{1}{25} + \frac{1}{50} + \frac{1}{100} = \frac{7}{100}$ of the work in one day.

Hence, they will complete the work in 100/7 days. Hence, they can complete the remaining 40% work in

 $0.4 \times \frac{100}{7} = \frac{40}{7}$ days.

Hence, option 3.

11. Correct Answer: C Solution:

In one day, Amit and Sagar can do;

 $\frac{1}{12} + \frac{1}{15} = \frac{3}{20}$ of the work in one day.

Hence, in 4 days they will complete 3/5th of the work. Hence, amount of work remaining after 4 days

 $= 1 - \frac{3}{5} = \frac{2}{5}$ Hence, **option 3**.

12. Correct Answer: D Solution:

In 9 days, B will do 9/24 = 3/8 of the work. Hence, A and B together did 1 - 3/8 = 5/8 of the work together. Now, A and B can complete; $\frac{1}{21} + \frac{1}{24} = \frac{5}{56}$ of the work in one day.

Hence, they will complete, 5/8 of the work in;

$$\frac{5}{8} \times \frac{56}{5} = 7 \text{ days.}$$

Hence, option 4.

13. Correct Answer: D Solution:

Let a, b, c be the amount of work done by A, B, C in 1 day and the total work be W units (a+b) 20 = (b+c) 30 = (a+c) 40 = W(a+b) 2 = (b+c) 3 = (a+c) 42a+2b = 3b+3cb = 2a-3c2a+2b = 4a+4c2b = 2a + 4c2(2a-3c) = 2a+4c2a=10c a=5c Number of days taken by A to complete the work = W/a Number of days taken by C to complete the work = W/b Required ratio = (W/a) / (W/b)= 1:5 D is the correct answer.

14. Correct Answer: C Solution:

Let the total work be W units and the number of people employed to do it were 'x' 24*x = 32*(x-9) 3x = 4(x-9) x=36 Number of people who were supposed to work originally = 36

C is the correct answer

15. Correct Answer: A
Solution:
Let the work done by a woman in one day
= x units
The work done by a man in one day = 2x units



8 men and 4 women together can complete a piece of work in 6 days. Total work = (8*2x+4*x)6 = 120x units Amount of work done by 8 men and 4 women in 2 days = (8*2x+4*x)2 = 40x units The remaining 80x units will be done by 8 women and 4 men Number of days taken by 8 women to complete 80x units of work = 80x/16x =5 days A is the correct answer.

Solution: Quantity of water let in by the leak in 1 hr= 15 tonnes Quantity of water thrown out by the pumps in 1 hr = 12 tonnes Net quantity of water filled in the ship in 1 hour =15-12=3 tonnes 60 tonnes water is filled in = 60/3= 20 hours Required speed = 40/20= 2kmph

17. Correct Answer: C Solution:

Let us assume the upstream speed of the boat = u and the downstream speed = v 30/u+44/v=10 40/u+55/v=13 Consider 1/u=a, 1/v=b, these equations become 30a+44b=10 40a+55b=13 We get a=1/5 and b=1/11 Hence, 1/u=1/5 and 1/v =1/11 => u=5 and v=11 Assuming speed of boat in still water is x and the speed of stream=y u=x-y=5 v=x+y=11 From these equations, we get x=8 km/hr

18. Correct Answer: C Solution:

Let the capacity of the tank be 60 litres. Capacity of the first pipe = 12 l/hr Capacity of the second pipe = 6 l/hr Capacity of the third pipe = 4 l/hr In 2 hrs, first pipe fills (9 + 12) l = 21 l In 2 hrs, second pipe fills (4.5 + 6) = 10.5 l In 2 hrs, third pipe fills (16/3) l In 2 hrs, tank filled = (21 + 10.5 + 5.33) l = 36.83 l Tank left to be filled = (60 - 36.83) l = 23.17 l Time required = (23.17/22) hr = 1.05 hrs Total time = 3.05 hrs Hence, option C is the correct answer.

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