MATHS

BOOKS - S CHAND IIT JEE FOUNDATION

TIME AND WORK

Solved Examples

1. A and B can do a piece of wok in 72 days, B and C can do it in 120 days, A and C can do it in

90 days. In what time can A alone do it ?

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2. A can do a piece of work in 80 days. A works for 10 days, then B complete the remaining work in 42 days. In how many days will (A + B) do this work together

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3. A can do a certain job in 12 days. B in 60% more efficient than A. What is the number of days it takes B to do the same piece of work ?

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4. Two men undertook to do a job for ₹ 1400. One of them can do it alone in 7 days and the other in 8 days. With the assistance of a boy they together completed the work in 3 days. How much money did the boy get ?

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5. Twelve children take sixteen days to complete a work which can be completed by eight adults in twelve days. Sixteen adults started working and after three days ten adults left and four children joined them. How many days will they take to complete the remaining work ? 3 b. 4 c. 6 d. 8 e. none of these

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6. If 6 men and 8 boys can do a piece of work in 10 days while 26 men and 48 boys can do the same in 2 days, the time taken by 15 men and 20 boys in doing the same type of work will be $4\ days$ b. $5\ days$ c. $6\ days$ d. $7\ days$

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7. A, B and C are employed to do a piece of work for Rs. 29. A and B together are supported to do $\frac{19}{23}$ of the work and B and C together $\frac{8}{23}$ of the work . What amount

should A be paid ? $Rs.315$ b. $Rs.345$ c. $Rs.355$ d. $Rs.375$

A. ₹ 315

B. ₹ 345

C. ₹ 355

D. ₹ 375

Answer: ₹ 345

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8. A contractor wants to complete a project in 90 days and he employed 60 workmen. After 60 days 3/4 of the work is completed. Then how many persons should he remove so that the project will be completed in stipulated time?

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9. 12 men can complete a work in 30 days by working 9 hours a day. What is the number of

men required to complete 10 times of this work in 24 days by working 5 hours a day ?

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10. 10 men working 6 hours a day can complete a work in 18 days. How many hours a day must 15 men work to complete the same work in 12 days.

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11. If 6 persons working 8 hours a day earn Rs. 8400 per week, then 9 persons working 6 hours a day will earn per week Rs. 8400 b. $Rs.940$ c. $Rs.16200$ d. $Rs.16800$

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12. 24 men can complete a piece of work in 16 days and 18 women can complete the same work in 32 days. 12 men and 6 women work together for 16 days. If the remaining work was

to be completed in 2 days, how many additional men would be required besisdes 12 men and 6 women ?

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13. Two pipes A and B can fill a tank in 15 hours and 20 hours respectively while a third pipe C can empty the full tank in 25 hours. All the three pipes are opened in the beginning. After 10 hours C is closed. In how much time will the

tank be full? $12\,hrs$ b. $13\,hrs$ c. $16\,hrs$ d. $18\,hrs$

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14. 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 $60\,gallons$ b. $100\,gallons$ c. $120\,gallons$ d. $180\,gallons$

A. 180

B. 150

C. 120

D. 60

Answer: 120 gallons

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15. A tap can fill a tank in 16 minutes and another can empty it in 8 minutes. If the tank is already $\frac{1}{2}$ full and both the taps are opened together , will the tank be filled or emptied?

How long will it take before the tank is either filled compoletely or emptied completely, as the case may be?

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16. Two pipes A and B can fill a cistern in 20 minutes and 25 minutes respectively Both are opened together at the end of 5 minutes B is turned off What is the total time taken to fill the cistern ?

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17. A cistern can be filled by two pipes in 30 and 40 min respectively. Both the pipes are opened at once, when the first pipe must be turned off so that the tank may be just filled in 18 min?

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18. Two pipes can fill a cistern in 30 and 15h respectively. The pipes are opened simultaeously and it is found that due to

leakage in the botttom, 5h extra are taken for cistern to be filled up. If the cistern is full, in what time would thhe leak empty it ?

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19. Pipes A and B running together can fill a cistern in 6 minutes. If B takes 5 minutes more than A to fill the cistern then, what will be the respective times in which A and B will fill the cistern separately?

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20. Three pipes A,B and C can fill a tank in 6 min, 8 min, and 12 min respectively. The pipe C is closed for 4 min before the tank is filled. In what time would the tank be fill

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21. Three pipes A,B and C can fill a cistern in 10h, 12h and 15h respectively. First A was opened. After 1 hour, B was opened and after 2

hours from the start of A, C was also opened. Find the time in which the cistern was just fill

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22. Two pipes A and B can fill an tank in 4 hours and 5 hours respectively. If the pipes A and B are turned on alternately for 1 hour eachm then what is the time taken to fill the tank

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Question Bank 20 A

1. A can do $\frac{1}{5}$ th part of the work in 12 days, B can do 60% of the work in 30 days and C can do $\frac{1}{3}$ rd of the work in 15 days. Who will complete the work first?

A. A

B. B

C. C

D. A and B both

Answer: C

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2. Ten women can complete a picce of work in 15 days. Six men can complete the same piece of work in 10 days. In how many days can 5 women and six men together complete the piece of work?

A. 15 days

B. 7.5 days

C. 9 days

D. 12.5 days

Answer: B

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3. 6 men or 10 boys can complete a piece of work in 15 days. If 7 men and x boys complete the same piece of work in 9 days, then x is equal to

A. 4

B. 5

C. 6

D. 7

Answer: B

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4. Ramu can complete a job in 8 days. Shyamu can complete the same job in 12 days. However, Monu $\frac{3}{4}$ th of the same job. Ramu

works for 2 days and then leaves the job. The number of days that will be taken by Shyamu and Monu to complete the balance together is

A. 4.2

B. 5.1

C. 6.2

D. 6.5

Answer: B

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5. If Ajit can do $\frac{1}{4}$ of the work in 3 days and Sujit can $\frac{1}{6}$ do of the same work in 4 days, how much will Ajit get if both work together and are paid ₹ 180 in all ?

A. ₹ 120

B. ₹ 108

C. ₹ 60

D. ₹ 36

Answer: A

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6. The work done by a man, a woman and a child are in the ratio 3:2:1. If the daily wages of 20 men, 30 women and 36 children amount to ₹ 78, what will be the wages of 15 men, 21 women and 30 children for 18 weeks?

A. ₹ 7371

B. ₹ 8645

C. ₹ 9000

D. 9500

Answer: A

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7. 40 men can do a piece of work in a given time. If only 30 men be engaged, 6 more days are needed to complete the work. In how many days can 60 men do the work?

A. 9

B. 10

C. 12

D. 15

Answer: C

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8. A man and a boy working together can complete a work in 24 days. If for the last 6 days, the man alone does the work, then it is completed in 26 days. How long will the boy take to complete the work alone ?

A. 72 days

B. 20 days

C. 24 days

D. 36 days

Answer: A

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9. A and B can do a piece of work in 20 days and 12 days respectively. A started the work alone and then after 4 days B joined him till

the completion of the work. How long did the work last?

A. 10 days

B. 20 days

C. 15 days

D. 6 days

Answer: A

10. A and B can do a piece of work in 28 and 35 days respectively. They began to work together but A leaves after some time and B completed the remaining work in 17 days. After how many days did A leave ?

A. $14\frac{2}{5}$ days

B. $9days$

C. $8days$

D. $7\frac{5}{9}$ days

Answer: C

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11. A alone can do a piece of work in 6 days and B alone in 8 days. A and B undertook to do it for ₹ 3200. With the help of C, they completed the work in 3 days. How much is to be paid to C?

A. ₹ 375

B. ₹ 400

C. ₹ 600

D. ₹ 800

Answer: B

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12. If 20 men working 7 hours a day can do a piece of work in 10 days, in how many days will 15 men working 8 hours a day do the same piece of work?

A. $15\frac{5}{21}$ days

B. $11\frac{2}{3}$ days

C. $6\frac{9}{16}$ days

D. $4\frac{1}{5}$ days

Answer: B

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13. 12 cows together eat 756 kg of grass in 7 days. How much grass will be caten by 15 cows in 10 days?

A. 1500 kg

B. 1200 kg

C. 1350 kg

D. 1400 kg

Answer: C

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14. If 5 spiders can catch 5 flies in 5 minutes, how many flies can 100 spiders catch in 100 minutes ?

A. 100

B. 500

C. 1000

D. 2000

Answer: D

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15. 8 men working for 9 hours a day can complete a piece of work in 20 days. In how

many days can 7 men working for 10 hours a day complete the same piece of work?

A. $20\frac{1}{2}$ days

B. $20\frac{3}{5}$ days

C. $21 days$

D. $20\frac{4}{7}$ days

Answer: D

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16. A job can be completed by 12 men in 12 days. How many extra days will be needed to complete the job, if 6 men leave after working for 6 days?

A. 10 days

B. 12 days

C. 8 days

D. 24 days

Answer: B

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17. A contractor undertakes to complete a road 360 m long in 120 days and employs 30 men for the work. After 60 days he finds that only 120 m length of the road has been made. How many more men should he employ so that the work may be completed in time ?

A. 20

B. 30

C. 15

D. 45

Answer: B

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18. A wall of 100 metres can be built by 7 men or 10 women in 10 days. How many days will 14 men and 20 women take to build a wall of 600 metres ?

A. 15

B. 20

C. 25

D. 30

Answer: A

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19. Twenty four men can complete a work in sixteen days. Thirty two women can complete the same work in twenty four days. Sixteen men and sixteen women started working and

worked for 12 days. How many more. men are to be added to complete the remaining work in 2 days ?

A. 16

B. 24

C. 36

D. 48

Answer: B

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20. 12 men and 16 boys can do a piece of work in 5 days, 13 men and 24 boys can do it in 4 days. The ratio of the daily work done by a man to that of a boy is

A. $2:1$

B. $3:1$

C. $3:2$

D. $5:4$

Answer: A

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21. Three men four women and six children can complete a work in seven days. A woman dos double the work a man does and a child does half the work a man doe. How many women alone can complete this work in 7 days? 7 b. 8 c. 12 d. cannot be determined e. none of these

A. 7

B. 8

C. 14

D. 12

Answer: A

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22. A man a wma and a boy can complete a job in 3,4, and 12 days respectively. How many boys must assist 1 man and 1 woman to complete the job in $\frac{1}{4}$ of a day? 1 b. 4 c. 19 d. 41

A. 1

B. 4

C. 19

D. 41

Answer: D

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23. A machine P can print one lakh books in 8 hours, machine Q can print the same number of books in 10 hours while machine R can print them in 12 hours. Al the machine are started at 9 a.m. while machine P is closed at 11 a.m. and the remaining two machines complete the

work. Approximately at what time will the work be finished? $11:30\ a\dot{m}.$ b. $12\ n\infty n$ c. $12:30\ p\dot{m}.$ d. $1\ p\dot{m}.$

A. 11:30 a.m

B. 12 noon

C. 12 : 30 p.m.

D. 1 p.m.

Answer: D

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24. A takes 5 hours more time than that taken by B to complete a work. If working together they can complete a work in 6 hours, then the number of hours that takes to complete the work individually is

A. 15

B. 12

C. 10

D. 9

Answer: C

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25. If x men, working x hours per day, can do x units of work in x days, then y mens, working y hours per day would be able to complete how many units of work in y days? $\frac{x^2}{y^3}$ b. $\frac{x^3}{y^2}$ c. $\frac{x^3}{y^2}$ d. $\frac{y^3}{x^2}$

A. $\frac{x^2}{y^3}$

B. $\frac{x^3}{y^2}$

C. $\frac{y^2}{x^3}$

D. $\frac{y^3}{x^2}$

Answer: D

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26. A started a work and left after working for 2 days. Then B was called and he finished the work in 9 days. Had A left the work after working for 3 days, B would have finished the remaining work in 6 days. In how many days can each of them, working , alone, finish the

whole work? $2.\ days,\ 7.5\ days$ b. $5\ days,\ 8.5\ days$ c. $5\ days,\ 15\ days$ d. none of these

A. 5 days, 8.5 days

B. 2.5 days, 7.5 days

C. 5 days, 15 days

D. 3 days, 15 days

Answer: C

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27. 15 men can complete a work in 210 days. They started the work but at the end of 10 days, 15 additional men, with double efficiency, were in- ducted. How many days in all did they take to finish the work ?

A. $72\frac{1}{2}$ days

B. $84\frac{3}{4}$ days

C. $76\frac{2}{3}$ days

D. 70 days

Answer: C

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Question Bank 20 B

1. Two pipes A and B can separately fill a cistern in 60 minutes and 75 minutes respectively. There is a third pipe in the bottom of the cistern to empty it. If all the three pipes are simultaneously opened then the cistern is full in 50 minutes. In how much time, the third pipe alone can empty the

cistern? $90\,m \in$ b. $100\,m \in$ c. $110\,m \in$ d. $120\,m \in$

A. 110 minutes

B. 100 minutes

C. 120 minutes

D. 90 minutes

Answer: B

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2. A cistern has a leak which would empty it in 8 hours. A tap is turned on, which admits 6 litres a minute into the cistern and it is now emptied in 12 hours. How many litres can the cistern hold?

A. 8000 litres

B. 8400 litres

C. 8640 litres

D. 8650 litres

Answer: C

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3. Two pipes A and B can fill a tank in 3 hours and 3 hours 45 minutes respectively. Third pipe C can empty the tank in 1 hour. All the three pipes are opened together when the tank is half filled. In how much time the tank will be emptied.

A. 1 hour 15 min

B. 2 hours 30 min

C. 3 hours 15 min

D. 4 hours 10 min

Answer: A

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4. A pipe can fill an oil-drum in 40 minutes. Another pipe can empty it in 60 minutes. When 2/3rd part of drum was filled with oil, the emp tying pipe was opened and 15 minutes later, it was closed. Now, in how much

time the drum will be filled, if filling pipe is opened?

A. $23\frac{1}{3}$ min

B. $25\frac{2}{3}$ min

C. $27\frac{1}{3}$ min

D. $28\frac{2}{3}$ min

Answer: A

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5. Two pipes can fill a tank with tank with water in 15 and 12 hours respectively and a third pipe can empty it in 4 hours. If the pipes be opened in order at 8,9 and 11a.m. respectively the tank will be emptied at $11:40\ a\dot{m}.$ b. $12:40\ p\dot{m}.$ c. $1:40\ p\dot{m}.$ d. $2:40\ p\dot{m}.$

A. 11:40 a.m.

B. 12:40 p.m.

C. 1:40 p.m.

D. 2:40 p.m.

Answer: D

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6. To pipes can fill a cistern in 14 hours and 16 hours respectively. The pipes are opened simultaneously and it is found that due to leakage in the bottom it took 32 minutes more to fill the cistern. When the cistern is full, in what time will the leak empty it?

A. 96 hours

B. 102 hours

C. 106 hours

D. 112 hours

Answer: D

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7. A pipe can empty a tank in 40 minutes. A second pipe with diameter twice as much as that of the first is also attached with the tan

to empty it. How much time will the tow pipes together take to empty the tank?

A. 8 min

B. 133 min

C. 30 min

D. 38 min

Answer: B

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8. Three pipes A, B and C can fill a tank in 6 hours. After working at it together for 2 hours, C is closed and A and B can fill the remaining part in 7 hours. number of hours taken by C alone to fill the tank is 10 b. 14 c. 12 d. 16

A. 10

B. 12

C. 14

D. 16

Answer: C

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9. A large tanker can he 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? $15\, m \in$ b. $20m \in$ c. $30\, m \in$ d. $27.\, 5\, m \in$

A. 15 minutes

B. 20 minutes

C. 27.5 minutes

D. 30 minutes

Answer: D

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10. Two taps can fill a tank in 20 minutes and 30 minutes respectively. There is an outlet tap at exactly half level of that rectangular tank which can pump out 100 litres of water per minute. If the outlet tap is open, then it takes

24 minutes to fill an empty tank. What is the volume of the tank?

A. 1800 litres

B. 1500 litres

C. 1200 litres

D. 2400 litres

Answer: A

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11. Two pipes A and B can fill a cistern in 12 min and 16 min respectively. Both the pipes are opened together for a certain time but due to some obstruction, the flow of water was restricted to $\frac{7}{8}$ of the full flow in pipe A and $\frac{5}{6}$ of the full in pipe

B. The obstruction, is removed after some time and the tank is now filled in 3 min from that moment. For how many minutes was the obstruction there?

A. 8 min

B. 3 min

C. 5.6 min

D. 4.5 min

Answer: D

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12. A, B, C are three pipes attached to a cistern. A and B can fill it in 20 min and 30 min respectively while C can empty it in 15 min. If A,

B, C kept open successively for 1 min each, how soon the cistern will be filled?

A. 167 min

B. 160 min

C. 166 min

D. 164 min

Answer: A

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13. A pipe A can fill a tank in 27 min. Due to develop-ment of a hole in the bottom of the tank $\frac{1}{10}$ of the bwater filled by pipe 4 leaks out. Find the time when the tank will be full.

A. 32 min

B. 34 min

C. 36 min

D. 30 min

Answer: D

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14. If two pipes are put in operation simultaneously, the tank is filled in 24 min. One pipe fills the tank in 20 min faster than the other. How many hours does the faster pipe take to fill the tank?

A. 60 min

B. 45 min

C. 40 min

D. 30 min

Answer: C

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15. Two pipes A and B can fill a cistern in 30 min and 40 min respectively. Both the pipes are turned on simultaneously. When should the second pipe be closed if the cistern is to be filled in 24 min.

A. 6 min

B. 8 min

C. 10 min

D. 12 min

Answer: B

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Self Assessment Sheet 20

1. A and B working separately can do a piece of work in 9 and 12 days respectively. If they work

for a day alternately, A beginning, in how many days, he work will be completed?

A. 11 days

B. $11\frac{1}{2}$ days

C. $10\frac{1}{4}$ days

D. $10\frac{1}{2}$ days

Answer: C

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2. A, B and C complete a piece of work in 25, 20 and 24 days respectively. All work together for 2 days and then A and B leave the work. C works for next $\frac{83}{5}$ days and then A along with D joins C and all finish the work in next three days. In how many days D alone can complete the whole work?

A. 22 days

B. $\frac{211}{2}$ days

C. 23 days

D. $\frac{221}{2}$ days

Answer: D

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3. 75 boys do a piece of work in 24 days. How many meri will finish double the work in 20 days when one days' work of 2 men is equal to one days' work of 3 boys?

A. 100 men

B. 150 men

C. 120 men

D. 80 men

Answer: C

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4. It takes 8,12 and 16 days for X, Y and Z respectively to complete a work. How many days will it take to complete the work if X works on it for 2 days, and then Y works on it

for until 25% of the work is left for Z to do, and then Z complete the work?

A. 10 days

B. 12 days

C. 8 days

D. 14 days

Answer: B

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5. Twelve children take sixteen days to complete a work which can be completed by eight adults in twelve days. Sixteen adults started working and after three days ten adults left and four children joined them. How many days will they take to complete the remaining work ? 3 b. 4 c. 6 d. 8 e. none of these

A. 6

B. 8

C. 4

D. 3

Answer: A

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6. 40 men take 8 days to earn Rs 2000 .How many men can earn Rs 200 in 2 days?

A. 10

B. 1

C. 8

D. 20

Answer: B

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7. A cistern which could be filled in 9 hours takes one hour more to be filled owing to a leak in its bottom. If the cistern is full, in what time will the leak empty it?

A. 19 hours

B. 1 hour

C. 90 hours

D. $\frac{10}{9}$ hours

Answer: C

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8. A swimming pool is fitted with three pipes with uniform flow. The first two pipes operating simultaneously fill the pool in the same time as that taken by the third pipe

alone. The second pipe fills the pool 5 hours faster than the first pipe and 4 hours slower than the third pipe. Find the time required by the third pipe to fill the pool.

A. 10 hours

B. 6 hours

C. 16 hours

D. 5 hours

Answer: B

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9. Two pipes A and B can fill a cistern in 12 minutes and 13 ininu4s respectively while a third pipe C can empty the full cistern in 6 minutes. A and Bare kept open for 5 minute in the beginning and the C is also opened. In what time is the cistern emptied? $30\,m \in$ b. $3\,m \in$ c. $45\,m \in$ d. $37\frac{1}{2}m \in$

A. 30 min

B. 33 min

C. 37.5 min

D. 45 min

Answer: D

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10. A tap can fill a bath in 20 minutes and another tap can fill it in 30 minutes . Amit opens both the taps simultaneously. When the both should have been full, he finds that the waste pipe was open. He then closes the waste

pipe and in another 4 minutes the bath is full.

In what time would the waste pipe empty it?

A. 35 min

B. 36 min

C. 38 min

D. 39 min

Answer: C

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