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CHAPTER

Time and Work / Pipes and Cisterns

1. 4 men can complete a piece of work in 2 days. 4 women can complete the same piece of work in 4 days whereas 5 children can complete the same piece of work in 4 days. If, 2 men, 4 women and 10 children work together, in how many days can the work be completed ?
 (SBI Rural Bus. PO 2010)
 (a) 1 day (b) 3 days (c) 2 days (d) 4 days
 (e) None of these

2. 6 women alone can complete a piece of work in 10 days, whereas 10 children alone take 15 days to complete the same piece of work. How many days will 6 women and 10 children together take to complete the piece of work ?
 (IBPS CWE 2011)
 (a) 7 (b) 8 (c) 6 (d) 4
 (e) None of these

3. Six women and 10 children together take six days to complete a piece of work. How many days will 10 children take to complete the piece of work if six women together can complete the same piece of work in 10 days?
 (IBPS CWE Clerk 2011)
 (a) 21 (b) 18 (c) 12 (d) 15
 (e) None of these

4. 4 women and 12 children together take four days to complete a piece of work. How many days will four children alone take to complete the piece of work if two women alone can complete the piece of work in 16 days?
 (IBPS CWE Clerk 2011)
 (a) 32 (b) 24 (c) 16 (d) 12
 (e) None of these

5. 2 women and 10 children together take 8 days to complete a piece of work. How many days will 10 children alone take to complete the piece of work if 8 women alone can complete the piece of work in 6 days ? **(IBPS CWE Clerk 2011)**
 (a) 15 (b) 12 (c) 10 (d) 24
 (e) None of these

6. A can do a piece of work in 10 days and B is 25% more efficient than A. In what time will the work be finished if A and B work together? **(SBI PO 2011)**
 (a) $4\frac{4}{9}$days (b) $5\frac{5}{7}$days (c) 5 days (d) $6\frac{2}{3}$days
 (e) None of these

7. A factory produces 1515 items in 3 days. How many items will they produce in a week ? **(IBPS Clerk CWE 2012)**
 (a) 3530 (b) 3553 (c) 3533 (d) 3535
 (e) None of these

8. 9 women can complete a piece of work in 19 days. How many days will 18 women take to complete the same piece of work? **(IBPS Clerk CWE 2012)**
 (a) 12 days (b) 6.5 days (c) 9 days (d) 8.5 days
 (e) None of these

9. 12 men alone can complete a piece of work in 6 days. whereas 10 men and 21 women together take 3 days to complete the same piece of work. In how many days can 12 women alone complete the piece of work?
 (RBI Assistant 2012)
 (a) 10 (b) 9 (c) 11 (d) 8
 (e) None of these

10. A juice centre requires 35 dozen guavas for 28 days. How many dozen guavas will it require for 36 days?
 (RBI Assistant 2012)
 (a) 50 (b) 52 (c) 40 (d) 45
 (e) None of these

11. A and B together can complete a particular task in 8 days. If B alone can complete the same task in 10 days, how many days will A take to complete the task if he works alone ? **(SBI Clerk 2012)**
 (a) 28 (b) 36 (c) 40 (d) 32
 (e) None of these

12. Two pipes can fill a tank in 10 h and 16 h respectively. A third pipe can empty the tank in 32 h. If all the three pipes function simultaneously, then in how much time the tank will be full? (in hours) **(IBPS Bank Clerk 2013)**
 (a) $7\frac{11}{21}$ (b) $7\frac{13}{21}$ (c) $8\frac{4}{21}$ (d) $6\frac{5}{14}$
 (e) $8\frac{9}{14}$

13. 56 workers can finish a piece of work in 14 days. If the work is to be completed in 8 days, then how many extra workers are required? **(IBPS Bank Clerk 2013)**
 (a) 36 (b) 48 (c) 44 (d) 42
 (e) 32

14. A alone can make 100 baskets in 6 days and B alone can make 100 baskets in 12 days. In how many days can A and B together make 100 baskets? **(IBPS RRBs OS 2013)**
 (a) 3 days (b) 5 days (c) $2\frac{1}{2}$ days
 (d) $3\frac{1}{2}$ days (e) None of these

15. 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?
 (IBPS Bank PO/MT 2013)
 (a) 5 days (b) 8 days (c) 6 days (d) 4 days
 (e) 9 days

16. If a certain number of workmen can do a piece of work in 25 hours, in how many hours will another set of an equal number of men, do a piece of work, twice as great, supposing that 2 men of the first set can do as much work in an hour, as 3 men of the second set do in an hour ?
 (IBPS Bank Clerk 2014)
 (a) 60 (b) 75 (c) 90 (d) 105
 (e) None of these

17. Pipes A and B can fill a tank in 5 and 6 hours, respectively. Pipe C can empty it in 12 hours. The tank is half full. All the three pipes are in operation simultaneously. After how much time, the tank will be full ? **(SBI Clerk 2014)**

    (a) $3\frac{9}{17}$ h (b) 11 h (c) $2\frac{8}{11}$ h (d) $1\frac{13}{17}$ h

    (e) None of these

18. A and B together can do a piece of work in 6 days. If A can alone do the work in 18 days, then the number of days required for B to finish the work is **(SBI Clerk 2014)**

    (a) 12 (b) 9 (c) 15 (d) 10

    (e) None of these

19. A tap can empty a tank in 30 minutes. A second tap can empty it in 45 minutes. If both the taps operate simultaneously, how much time is needed to empty the tank? **(SBI Clerk 2014)**

    (a) 18 minutes (b) 14 minutes

    (c) 15 minutes (d) 30 minutes

    (e) None of these

20. A contract is to be completed in 46 days and 117 men were set to work, each working 8 hours a day. After 33 days, 4/7 of the work is completed. How many additional men may be employed so that the work may be completed in time, each man now working 9 hours a day ?

    (IBPS PO/MT CWE 2014)

    (a) 80 (b) 81 (c) 82 (d) 83

    (e) None of these

21. Two pipes A and B can fill a cistern in 30 minutes and 40 minutes respectively. Both the pipes are opened. Find when the second pipe B must be turned off so the cistern may just be full in 10 minutes. **(IBPS PO/MT CWE 2014)**

    (a) $26\frac{2}{3}$ min (b) 25 min

    (c) $40\frac{2}{3}$ min (d) $42\frac{2}{3}$ min

    (e) None of these

22. Two workers A and B working together completed a job in 5 days. If A worked twice as efficiently as he actually did and B worked $\frac{1}{3}$ as efficiently as he actually did, the work would have completed in 3 days. Find the time for A to complete the job alone. **(IBPS SO 2014)**

    (a) $6\frac{1}{4}$ days (b) $5\frac{3}{4}$ days

    (c) 5 days (d) 3 days

    (e) None of these

23. Pipe A can fill a tank in 30 minutes while pipe B can fill it in 45 minutes. An other pipe C can empty a full tank in 60 minutes. If all three pipes are opened simultaneously, the empty tank will be filled in **(Corporation Bank SO 2014)**

    (a) $\frac{2}{7}$ hour (b) $\frac{3}{7}$ hour

    (c) $\frac{4}{7}$ hour (d) $\frac{5}{7}$ hour

    (e) None of these

24. A can build up a wall in 8 days while B can break it in 3 days. A has worked for 4 days and then B joined to work with A for another 2 days only. In how many days will A alone build up the remaining part of wall?**(IBPS RRB OS 2014)**

    (a) $13\frac{1}{3}$ days (b) $7\frac{1}{3}$ days

    (c) $6\frac{1}{3}$ days (d) 7 days

    (e) None of these

25. 12 men can finish a project in 20 days. 18 women can finish the same project in 16 days and 24 children can finish it in 18 days. 8 women and 16 children worked for 9 days and then left. In how many will 10 men complete the remaining project? **(IBPS RRB OA 2015)**

    (a) $10\frac{1}{2}$ (b) 10 (c) 9 (d) $11\frac{1}{2}$

    (e) $9\frac{1}{2}$

26. A is twice as efficient as B. B started the work and after 4 days A joins B and the total work was complete in 9 days then B can complete whole work alone in:

    (IBPS RRB OA 2015)

    (a) 9.5 days (b) 10 days (c) 19 days (d) 38 days

    (e) None of these

27. Two boys can do a piece of work in ten days. Three girls can do the same work in five days. In how many days can a boy and a girl together do the work? **(IBPS Clerk 2015)**

    (a) 16 days (b) $8\frac{4}{7}$ days (c) 12 days (d) $5\frac{1}{2}$ days

    (e) None of these

28. A and B undertake to complete a piece of work for Rupees 1200. A can do it in 8 days, B can do it in 12 days and with the help of C they complete the work in 4 days. Find the share of C? **(IBPS Clerk 2015)**

    (a) 100 (b) 200 (c) 300 (d) 400

    (e) None of these

29. A works twice as fast as B. If B can complete a work in 24 days independently, the number of days in which A and B can together finish the work is **(IBPS SO 2015)**

    (a) 12 days (b) 9 days (c) 8 days (d) 6 days

    (e) None of these

30. A is thrice as efficient as B and hence completes a work in 40 days less than the number of days taken by B. What will be the number of days taken by both of them when working together ? **(IBPS CWE-RRB OS 2015)**

    (a) 22.5 days (b) 15 days (c) 20 days (d) 18 days

    (e) None of these

31. If one man or three women or five boys can do a piece of work in 46 days then how many days will one man, one woman and one boy together take to complete the same piece of work? **(SBI JA & JAA Clerk 2016)**

    (a) 30 days (b) 32 days (c) 35 days (d) 40 days

    (e) None of these

32. Four examiners can examine a certain number of answer papers in 10 days by working for 5 hours a day. For how many hours in a day would 2 examiners have to work in order to examine twice the number of answer papers in 20 days? **(SBI Clerk Mains 2016)**

(a) 8 hours   (b) $7\frac{1}{2}$ hours   (c) 10 hours

(d) $8\frac{1}{2}$ hours (e) None of these

33. 24 men can complete a piece of work in 15 days. 2 days after the 24 men started working, 4 men left the work. How many more days will the remaining men now take to complete the remaining work? **(IBPS IT Specialist 2016)**

(a) $15\frac{3}{5}$ (b) $16\frac{4}{5}$ (c) $11\frac{2}{5}$ (d) $10\frac{4}{5}$

(e) $14\frac{1}{5}$

34. A, B and C can alone complete a work in 15, 25 and 30 days respectively. A and B started the work and after some days A is replaced by C. Now the work is completed in a further of $6\frac{4}{11}$ days. How much of the total work did B did?

(IBPS IT Specialist 2016)

(a) $\frac{4}{11}$ (b) $\frac{4}{15}$ (c) $\frac{5}{12}$ (d) $\frac{5}{11}$

(e) $\frac{2}{13}$

35. If P can do a work in 6 days and Q can do the same work in 8 days. R can do the same work in 12 days. If they are working together then the work will be completed in how many days? **(IBPS Clerk Pre 2016)**

(a) $\frac{7}{3}$ days (b) $\frac{8}{3}$ days   (c) $\frac{10}{3}$ days(d) $\frac{11}{3}$ days

(e) None of these

36. Three pipes P, Q and R can fill a tank in 12, 15 and 20 minutes respectively. If pipe P is opened all the time and pipe Q and R are opened for one hour alternatively. The tank will be full in **(IBPS Clerk Main 2016)**
(a) 5hr   (b) 6hr   (c) 7hr   (d) 8hr
(e) None of these

37. Three pipes A, B, and C can fill the tank in 10 hours, 20 hours and 40 hours respectively. In the beginning all of them are opened simultaneously. After 2 hours, tap C is closed and A and B are kept running. After the 4th hour, tap B is also closed. The remaining work is done by tap A alone. What is the percentage of the work done by tap A alone? **(IBPS PO Pre 2016)**
(a) 30%   (b) 35%   (c) 45%   (d) 50%
(e) None of the above

38. A and B can do a piece of work in 24 and 30 days respectively. Both started the work and worked for 6 days. Then B leaves the work and C joins and the remaining work is completed by A and C together in 11 days. Find the days in which C alone can do the work

(IBPS PO Mains 2016)
(a) 80   (b) 100   (c) 120   (d) 130
(e) None of these

39. Three pipe P, Q and R can fill a tank in 12 minutes, 18 minutes and 24 minutes respectively. The pipe R is closed 12 minutes before the tank is filled. In what time the tank is full? **(IBPS PO Mains 2016)**

(a) $8\frac{5}{13}$ hrs. (b) $8\frac{4}{13}$ hrs. (c) $7\frac{4}{13}$ hrs (d) $8\frac{6}{13}$ hrs
(e) None of these

40. Pipes A and B can fill a cistern in 15 hours together. But if these pipes operate separately A takes 40 hours less than B to fill the tank. In how many hours the pipe A will fill the cistern working alone? **(IBPS PO Mains 2016)**
(a) 60   (b) 20   (c) 40   (d) 15
(e) 25

41. A, B and C can alone complete a work in 10, 12 and 15 days respectively. A and C started the work and after working for 4 days, A left and B joined. In how many days the total work was completed? **(SBI PO Pre 2016)**

(a) $6\frac{5}{9}$ days (b) $6\frac{2}{9}$ days (c) 6 days (d) $5\frac{4}{9}$ days

(e) $7\frac{2}{9}$ days

42. There are 4 filling pipes and 3 emptying pipes capable of filling and emptying in 12 minutes and 15 minutes respectively. If all the pipes are opened together and as a result they fill 10 litres of water per minute. Find the capacity of the tank. **(SBI PO Pre 2016)**
(a) 65 ltr   (b) 70 ltr   (c) 75 ltr   (d) 80 ltr
(e) None of these

43. A contractor undertakes to make a mall in 60 days and he employs 30 men. After 30 days it is found that only one-third of the work is completed. How many extra men should he employ so that the work is completed on time?
(IBPS Clerk Pre 2016)
(a) 20 men   (b) 25 men   (c) 30 men (d) 40 men
(e) None of these

44. One pipe P is 4 times faster than pipe Q and takes 45 minutes less than pipe Q. In what time the cistern is full if both the pipes are opened together? **(IBPS Clerk Pre 2016)**
(a) 8 minutes   (b) 10 minutes
(c) 12 minutes   (d) 14 minutes
(e) None of these

45. B is 20% more efficient than A. B started the work & do it for x days. And then B is replaced by A. A completed the remaining work in x+8 days. Ratio of work done by A & B is 3:2. In how many days A & B working together complete the whole work? **(SBI PO Prelim Exam 2017)**

(a) $13\frac{11}{17}$ days   (b) $12\frac{7}{11}$ days

(c) $13\frac{7}{11}$ days   (d) $12\frac{8}{13}$ days

(e) None of these

DIRECTIONS (Qs. 46–47) : Each of A, B, C and D need a unique time to do a certain work. A can do the work in x days and B can do the work in 2x days. A started the work and do it for $22\frac{2}{9}$ days then he is replaced by B and B completed remaining work in same time as C and D together can complete the whole work.

The ratio of the efficiency of C and D is 4 : 5. If C and D work for alternative days starting from C then they can do the total work in $44\frac{1}{2}$ days.

46. Find the value of x
    (a) $66\dfrac{2}{3}$ (b) $33\dfrac{1}{3}$ (c) $16\dfrac{2}{3}$ (d) $14\dfrac{2}{7}$
    (e) None of these

47. If E and F together work for 24 days then they are replaced by A and B respectively then they can do the remaining work in 20 days. If the efficiency of E and F is 5 : 4, If E and F together complete the whole work then find the difference between the work done by E alone and the total work done by F alone?
    (a) $\dfrac{1}{9}$ (b) $\dfrac{1}{7}$ (c) $\dfrac{2}{7}$ (d) $\dfrac{1}{3}$
    (e) $\dfrac{3}{4}$

48. P can complete a task in 15 days Q is 50% more efficient than P. Both P and Q started working together on the task and after few days Q left task and P finished the remaining $\dfrac{1}{3}$ of the given work. For how many days P and Q worked together. **(IBPS RRB Scale-I Prelim 2017)**
    (a) 3   (b) 5   (c) 4   (d) 6
    (e) 2

49. P can complete a work in 72 days. Q is 33.33% more efficient than P. In how many days both complete the work if they work on alternate days starting with P?
    (IBPS RRB Scale-I Main Exam 2017)
    (a) 56 days   (b) 60 days   (c) 62 days   (d) 5 days
    (e) None of these

50. 24 men can complete a piece of work in 15 days. 2 days after the 24 men started working, 4 men left the work. How many more days will the remaining men now take to complete the remaining work?
    (IBPS RRB Scale - 2 & 3 Main Exam 2017)
    (a) $15\dfrac{3}{5}$ (b) $16\dfrac{4}{5}$ (c) $11\dfrac{2}{5}$ (d) $10\dfrac{4}{5}$
    (e) $14\dfrac{1}{5}$

51. A, B and C can do a piece of work individually in 8, 12 and 15 days, respectively. A and B start working but A quits after working for 2 days. After this, C joins B till the completion of work. In how many days will the work be completed? **(IBPS PO Prelim Exam 2017)**
    (a) $5\dfrac{8}{8}$ days   (b) $4\dfrac{2}{3}$ days   (c) 6 days   (d) 3 days
    (e) None of the above

52. A contract is to be completed in 50 days and 105 men were set to work, each working 8 h a day. After 25 days, 2/5th of the work is finished. How many additional men be employed, so that the work may be completed on time, each man now working 9 h a day? **(IBPS PO Prelim Exam 2017)**
    (a) 34   (b) 36   (c) 35   (d) 37
    (e) None of the above

53. 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. Now how much time more is required to fill the tank? **(IBPS PO Prelim Exam 2017)**
    (a) 2 hrs   (b) 3 hrs   (c) 6 hrs   (d) 1 hr
    (e) None of these

54. If 60 engineers or 120 doctors or 100 teachers can finish a work in 360 days then in how many days will 10 engineers, 40 doctors and 50 teachers working together will complete the same work? **(IBPS PO Prelim Exam 2017)**
    (a) 360   (b) 320   (c) 400   (d) 440
    (e) None of these

55. A alone can do a work in 12 days. Time taken by A in completing 1/3 of work is equal to the time taken by B in completing 1/2 of the work. In what time A and B together will complete the work? **(IBPS PO Prelim Exam 2017)**
    (a) 6 days   (b) 4 days   (c) 12 days   (d) $\dfrac{24}{5}$ days
    (e) 8 days

56. A bath tub can be filled with the cold water pipe in 10 minutes and by hot water pipe in 15 minutes (independently each). A person leaves the bathroom after turning on both pipes simultaneously and returns at the moment when the bath should be full. Finding, however, that the waste pipe has been opened he now closes it. In 4 minutes more, the bath is full. In what time would be the waste pipe empty it?
    (IBPS PO Main Exam 2017)
    (a) 6 minutes   (b) 9 minutes
    (c) 3 minutes   (d) 15 minutes
    (e) None of these

57. 2 men can complete a piece of work in 6 days. 2 women can complete the same piece of work in 9 days, where as 3 children can complete the same piece of work in 8 days. 3 women and 4 children worked together for 1 day. If only men were to finish the remaining work in day, how many total men would be required?
    (IBPS PO Main Exam 2017)
    (a) 4   (b) 8   (c) 6
    (d) can't be determined   (e) None of these

58. Two boats are traveling towards each other in a stream. They both can travel at 30 kmph in still water. If they are 300 km apart how long will it take them to cross each other if the speed of the stream is 5 kmph?
    (IBPS SO IT Officer Pre. 2018)
    (a) 4 hours   (b) 5 hours   (c) 6 hours   (d) 4.5 hours
    (e) 5.5 hours

59. A certain work is completed by A and B together in 10 days. If A had worked at twice the speed and B had worked at half his speed it would have taken them 8 days to finish the work. Find the time in which B can alone finish the work. **(IBPS SO IT Officer Pre. 2018)**
    (a) 20 days   (b) 24 days   (c) 30 days   (d) 32 days
    (e) None of these

60. A tap can fill a tank in 16 hours whereas another tap can empty the tank it in 8 hours. If in a three fourth filled tank both the taps are opened, then how long will it take to empty the tank in this scenario?
    (IBPS SO IT Officer Pre. 2018)
    (a) 6 hours   (b) 8 hours   (c) 10 hours   (d) 12 hours
    (e) 14 hours

61. A man is 40% more efficient than a woman, and a child is 40% less efficient than a woman. 3 men, 5 women, and 4 children work for 7 days to complete a job. How many days will 2 men, 7 women and 3 children take to complete the same job? **(IBPS SO IT Officer Pre. 2018)**
    (a) 4.5 days   (b) 5.5 days   (c) 6.5 days   (d) 7 days
    (e) None of the above

62. 'X' can complete a work in 40 days while Y is 20% more efficient than 'X'. 'Y' worked for 8 days and left, remaining work is completed by 'Z' in 20 days. Find in how many days 'Z' can complete the whole work alone? **(IBPS PO Pre-2018)**
(a) 27 days (b) 21 days (c) 18 days (d) 26 days
(e) 30 days

63. A man travels from Point A to B with 70 km/hr and from B to C with 50 km/hr. Total distance between A to C is 300 km. If his average speed is 60 km/hr then find the distance between A and B? **(IBPS PO Pre-2018)**
(a) 175 km (b) 125 km (c) 100 km (d) 150 km
(e) None of the given options

64. A alone can do a work in 20 days. The ratio of time taken by A and B to do the same work is 4 : 3. Then, find in how many days both will complete the work together ?
(IBPS RRB Clerk Pre-2018)
(a) 7.25 days (b) 12 days
(c) 8 days (d) 8.5 days
(e) 10 days

65. R is 1.5 times as efficient as that of P, and Q takes half time as compared to that of R. If R and P takes $2\frac{2}{5}$ days to complete half of the work then find the time taken by R and Q together to complete the whole work?
(IBPS Clerk Pre -2018)

(a) $2\frac{1}{3}$ days (b) $3\frac{1}{3}$ days

(c) $1\frac{1}{3}$ days (d) $1\frac{2}{3}$ days

(e) $2\frac{2}{3}$ days

66. Efficiency of Q is two times more than efficiency of P. Both started working alternatively, starting with Q and completed the work in total 35 days. If R alone complete the same work in 48 days then find in how many days P and R together will complete the work? **(RRB PO Pre-2018)**
(a) 24 days (b) 28 days (c) 36 days (d) 27 days
(e) 30 days

67. 8 men and 5 women together can complete a piece of work in 7 days and work done by a women in one day is half the work done by a man in one day. If 9 men and 3 women started working and after 4 days 4 men left the work and 4 new women joined then, in how many more days will the work be completed **(RRB PO Pre-2018)**
(a) 7 days (b) 6 days (c) 5.25 days (d) 3.7 days
(e) 8.14 days

68. A shopkeeper gives 10% discount on marked price of an article and earns a profit of 25% on it. If cost price of the article is ₹ 2160, then find the marked price of the article?
(SBI Clerk Pre-2018)
(a) ₹2500 (b) ₹2700 (c) ₹3500 (d) ₹3000
(e) ₹4500

69. Raja and Baja working alone can do a work in 20 days and 15 days respectively. They started the work together but Baja left after sometime and Raja finished remaining work in 6 days. Find after how many days from start Baja left the work? **(SBI Clerk Main-2018)**
(a) 5 days (b) 4 days (c) 6 days (d) 3 days
(e) 7 days

70. Shahu can do a work in 18 days, Yash can do the same work in 24 days and Dixit can do the whole work in 36 days. If Shahu & Yash work for first A days together after that Dixit also joined them, remaining work is completed in $\left(A+4\frac{4}{5}\right)$ days. Find for how many days all three worked together? **(IBPS PO Main-2018)**

(a) $6\frac{4}{5}$ days (b) $5\frac{4}{5}$ days (c) $4\frac{4}{5}$ days (d) $7\frac{4}{5}$ days

(e) $8\frac{4}{5}$ days

71. Raj is 100% more efficient than Rajan. Rajeev alone can complete a piece of work in 9 days and Rajan & Raj together can complete the same work in $2\frac{2}{3}$ days. Find what portion of work will be completed. If Rajeev & Rajan works together for 4 days. **(IBPS Clerk Prelim-2019)**

(a) $\frac{13}{18}$ (b) $\frac{8}{9}$ (c) $\frac{5}{6}$ (d) $\frac{2}{3}$

(e) $\frac{17}{18}$

72. Ramu covers $6\frac{1}{4}$% distance via bus at 80 km/hr, 25% of the distance via motorcycles at 80 km/hr, 30% distance via bicycle at 64 km/hr. and remaining distance via trains at 124 km/hr. If total distance covered by Ramu is 1280 km, then find the total time taken Ramu during the entire journey.
(IBPS Clerk Prelim-2019)
(a) 13 hours (b) 17 hours (c) 18 hours (d) 16 hours
(e) 15 hours

73. Satish is 50% more efficient than Charan. They together start the work and $\frac{7}{12}$ th of work is left after 8 days. Find in what time Charan alone will complete the whole work.
(IBPS Clerk Main-2019)
(a) 36 days (b) 44 days (c) 50 days (d) 40 days
(e) 48 days

74. The daily work of 3 women is equal to that of 2 men or that of 4 children. By employing 12 women, 14 men, and 12 children a certain work can be finished in 24 days. If it is required to finish it in 12 days and as an additiional labour, only Man are available, how many of them will be required?
(IBPS Clerk Main-2019)
(a) 18 (b) 20 (c) 48 (d) 28
(e) 24

75. Ram can do a work in 72 days while Mohan can do the same in 96 days. If Ram work for 'x' days while Mohan work for ' x + 2' days then one-third of the work is complete. Find the value of x. **(IBPS PO Prelim-2019)**

(a) $11\frac{3}{4}$ (b) $8\frac{6}{7}$ (c) 14 (d) 16

(e) $12\frac{6}{7}$

(IBPS PO Main-2019)

There were two similar tanks P and Q with five similar pipes A, B, C, D and E. Pipes A, B and C can fill the empty tank in 20 minutes, 30 minutes and 60 minutes respectively. While pipes D and E can empty the filled tank in 40 minutes and 60 minutes respectively. Tank P had no leaks but tank Q had a leak, such that when pipe A was opened in the empty tank Q it took 24 minutes to fill the tank.

76. Pipes A, B and C were simultaneously opened into the empty tank P such that pipes A and B were discharging milk and pipe C was discharging water into the tank. So, the tank will be 60% filled after _____ minutes and the mixture in the tank will contain _____ part of milk Which of the following options satisfies the two blanks in the question?
   (a) 2, 3/4   (b) 2, 4/5   (c) 3, 3/20 (d) 3, 6/7
   (e) 6, 5/6

77. When pipes A and B were simultaneously opened into a 30% filled tank P, it will be _____% filled after 6 minutes, while if pipes B and C were simultaneously opened into a 30% filled tank P, it will be 70% after _____ minutes.
   Which of the following options satisfies the two blanks in the questions?
   (a) 60, 2   (b) 60, 3   (c) 70, 3   (d) 70, 4
   (e) 80, 8

78. When pipes B and D were simultaneously opened in the empty tank P, 20 gallons of liquid was filled in the tank after 12 minutes. This means that the tank has a capacity of _____ gallons and pipe D can empty it at a rate of _____ gallons per minute.
   Which of the following options satisfies the two blanks in the question?
   (a) 200, 5   (b) 240, 12   (c) 280, 15 (d) 320, 20
   (e) None of these.

79. All the five pipes A, B, C, D and E were simultaneously opened into the tank P which was initially $\frac{2}{5}$ part filled, and were closed one by one respectively after every minute, then the tank is _____ part filled when the pipe C was closed and _____ part filled when the pipe E was closed. Which of the following options satisfies the two blanks in the question?
   (a) $\frac{23}{40}, \frac{53}{120}$ (b) $\frac{53}{120}, \frac{23}{60}$ (c) $\frac{23}{60}, \frac{23}{40}$ (d) $\frac{25}{48}, \frac{23}{60}$
   (e) $\frac{40}{7}, \frac{25}{8}$

80. 80 women can complete a work in 24 days. 32 women started for the same work for x days. After x days, 16 women increased, So, the remaining work is completed in $16\left(\frac{2}{3}\right)$ days. Find x.   **(SBI PO Prelim-2019)**
   (a) 35   (b) 38   (c) 10   (d) 26
   (e) None of these

81. A contract is to be completed in 50 days and 105 men were set to work, each working 8 h a day. After 25 days, 2/5th of the work is finished. How many additional men be employed, so that the work may be completed on time, each man now working 9 h a day?   **(SBI PO Main-2019)**

(a) 34   (b) 36   (c) 35   (d) 37
(e) None of the above

82. Panas alone can type a book in 12 days while Panas and Abdul together can type in 7.5 days. Find the time taken by Rekha alone to do that typing if Rekha takes 3 days more than that of Abdul alone to do that book typing?   **(SBI Clerk Prelim-2019)**
   (a) 33 days (b) 30 days   (c) 23 days (d) 27 days
   (e) 28 days

83. If pipes A and B can fill a tank in 18 min and 24 mins respectively and pipe C empties the tank in 12 mins. What will be the time taken by A, B and C together to fill the tank completely ?   **(IBPS RRB PO Prelim-2019)**
   (a) 36   (b) 72   (c) 54   (c) 96
   (e) 12

84. A tank is to be filled by two pipes P and Q. P can fill the tank in 4 hours and Q can fill in 6 hours. It is found that a hole is located at one quarter of the height from the bottom which leaks 3 litres of water per 4 minutes. When two pipes are opened (tank is empty), the tank will be full in 2 hour 36 minutes. Find the capacity of the tank.   **(IBPS RRB PO Main-2019)**
   (a) 1400 liters   (b) 1200 liters
   (c) 1600 liters   (d) 1080 liters
   (e) 1250 liters

85. The water in a rectangular reservoir having a base 80 m by 60 m is 6.5 m deep. In what time can the water be emptied by a pipe of which the cross-section is a square of side 20 cm, if the water runs through the pipe at the rate of 15 km per hour?   **(IBPS RRB PO Main-2019)**
   (a) 40 hrs.   (b) 58 hrs.   (c) 54 hrs. (d) 52 hrs.
   (e) None of these

86. Two inlet taps A and B can fill a tank in 32 minutes and 48 minutes respectively. Find the time taken by both the taps together to fill $\frac{1}{6}$ th of the tank?   **(IBPS RRB Clerk Prelim-2019)**
   (a) 4 minutes   (b) $3\frac{3}{4}$ minutes
   (c) $3\frac{1}{5}$ minutes   (d) $3\frac{1}{3}$ minutes
   (e) $2\frac{1}{3}$ minutes

87. 4 men and 6 women together can complete a piece of work in 4 days. 2 man and 4 boys together complete the work in 8 days. 6 women and 4 boys together can complete the work in 6 days. In how many days 4 men, 6 women and 8 boys together can complete the work?   **(IBPS RRB Clerk Main-2019)**
   (a) 72/13 days   (b) 72/11 days
   (c) 36/13 days   (d) 36/11 days
   (e) 27/13 days

88. Shivam alone and Deepak alone can finish a task in 12 hours and 15 hours respectively. Find the time taken by both of them together to do twice of the work?   **(RBI Assist Prelim-2020)**
   (a) 8 hr   (b) $13\frac{1}{3}$ hr   (c) $7\frac{3}{4}$ hr (d) 6 hr
   (e) $6\frac{2}{3}$ hr

Answers & Explanations

1. (a) 4×2 men $= 4 \times 4$ women $= 5 \times 4$ children
   $\Rightarrow 2$ men $= 4$ women $= 5$ children
   $\therefore 2$ men $+ 4$ women $+ 10$ children
   $= 20$ children
   $\therefore M_1 D_1 = M_2 D_2$
   $\Rightarrow 5 \times 4 = 20 \times D_2 \Rightarrow D_2 = 1$ day

2. (c) In 1 day (6×10) women can complete the piece of work and in 1 day (10×15) children can complete the same piece of work.
   $\therefore 6 \times 10$ women $\equiv 10 \times 15$ children
   $\Rightarrow 2$ women $\equiv 5$ children
   $\therefore 6$ women $+ 10$ children $= (15 + 10)$ children
   $= 25$ children
   $M_1 D_1 = M_2 D_2 \Rightarrow 10 \times 15 = 25 \times D_2$
   $\Rightarrow D_2 = \dfrac{10 \times 15}{25} = 6$ days

3. (d) $\because$ Work done by 6 women in 1 day $= \dfrac{1}{10}$

   Work done by 6 women in 6 days $= \dfrac{6}{10} = \dfrac{3}{5}$

   $\therefore$ Remaining work $= \left(1 - \dfrac{3}{5}\right) = \dfrac{2}{5}$ which is completed by 10 children in 6 days.

   $\therefore$ Work done by 10 children in 1 day $= \dfrac{2}{5 \times 6} = \dfrac{1}{15}$

   $\therefore$ Time taken in completing the work $= 15$ days.
   Alternate Method:

   Number of days required $= \dfrac{6 \times 10}{4} = 15$ days

4. (b) Two women alone can complete a piece of work in 16 days.
   $\therefore$ Four women can complete the same work in 8 days.
   $\because$ 12 children can complete the work in

   $= \dfrac{4 \times 8}{8} = 8$ days

   $\therefore$ Four children can complete the work in

   $\dfrac{12 \times 8}{4} = 24$ days.

5. (b) 8 women can do a work in 6 days.

   $\therefore$ 2 women can do same work in $\dfrac{8 \times 6}{2} = 24$ days

   $\therefore$ 2 women can do $\dfrac{1}{24}$ work in 1 day.

   $\because$ (2 women + 10 children) can do a work in 8 days.

   $\therefore$ (2 women + 10 children)'s 1 days work $\dfrac{1}{8}$

10 Children 1 day work

$= \dfrac{1}{8} - \dfrac{1}{24} = \dfrac{1}{12}$ work

Hence 10 children can do same work in 12 days.

6. (a) Time taken by B $= 10 \times \dfrac{100}{125} = 8$ days

   Required days $= \dfrac{8 \times 10}{18} = 4\dfrac{4}{9}$ days

   $= 10 \div (1 + 1.25) = \dfrac{10}{2.25} = \dfrac{40}{9} = 4\dfrac{4}{9}$

7. (d) Number of items produced in 3 days $= 1515$

   Number of items produced in 1 day $= \dfrac{1515}{3}$

   Required number of items

   $= \dfrac{1515 \times 7}{3} = 3535$

8. (e) $M_1 D_1 = M_2 D_2$
   $\Rightarrow 9 \times 19 = 18 \times D_2$

   $\Rightarrow D_2 = \dfrac{9 \times 19}{18} = 9.5$ days

9. (b) $\because$ 12 men complete the work in 6 days.

   $\therefore$ 1 man's 1 day's work $= \dfrac{1}{72}$

   $\therefore$ 10 men's 3 day's work $= \dfrac{10 \times 3}{72} = \dfrac{5}{12}$ work

   Remaining work $= 1 - \dfrac{5}{12} = \dfrac{7}{12}$

   $\therefore$ 21 women do $\dfrac{7}{12}$ work in 3 days.

   $\therefore$ By $\dfrac{M_1 D_1}{W_1} = \dfrac{M_2 D_2}{W_2}$

   $\Rightarrow \dfrac{21 \times 3}{\dfrac{7}{12}} = \dfrac{12 \times D_2}{1} \Rightarrow \dfrac{21 \times 3 \times 12}{7 \times 12} = D_2$

   $\Rightarrow D_2 = 9$ days

10. (d) For 28 days $\equiv$ 35 dozens of guavas

    For 1 day $= \dfrac{35}{28}$ dozens

    Now 36 days $= \dfrac{35}{28} \times 36 = 45$ dozens

11. (c) Let the A can do the task in x days.

    $\dfrac{1}{x} + \dfrac{1}{10} = \dfrac{1}{8}$

    $\dfrac{1}{x} = \dfrac{1}{8} - \dfrac{1}{10} = \dfrac{10 - 8}{80} = \dfrac{2}{80} = \dfrac{1}{40} = x = 40$

Alternate Solution:

If total work = 80 units

Then in 1 day (A + B) will do $\dfrac{80}{8}$ = 10 units of work

In 1 day B can do $\dfrac{80}{10}$ = 8 unit of work

∴ A does 2 unit of work each day

∴ A requires $\dfrac{80}{2}$ = 40 days to complete work

12. (b) 10 hr A pipe →1
16 hr B pipe →1
32 hr C pipe →1

$$\frac{1}{10}+\frac{1}{16}-\frac{1}{32}=\frac{21}{160}$$

$$\frac{160}{21}=7\frac{13}{21}\ hr$$

Alternate Solution:

Time required to fill	Capacity	Units filled in 1 hour
Pipe A 10 hours →	LCM of 10, 16, 32 = 160 units	→ 16
Pipe B 16 hours →		→ 10
Pipe C 32 hours →		→ –5 units

Working together in 1 hour, they fill—
(16 + 10 – 5) units = 21 units

∴ Total time required = $\dfrac{160}{21}$ = $7\dfrac{13}{21}$ hours.

13. (d) Here, M_1 = 56, D_1 =14, M_2 = ?, D_2 = 8
Using
$M_1 D_1 = M_2 D_2$,
56 × 14 = M_2 × 8
⇒ M_2 = 98
Hence, extra workers to be required
= 98 – 56 = 42

14. (e) A's 1 day's work = $\dfrac{1}{6}$

B's 1 day's work = $\dfrac{1}{12}$

∴ (A + B)'s 1 day's work = $\dfrac{1}{6}+\dfrac{1}{12}=\dfrac{2+1}{12}=\dfrac{1}{4}$

∴ A and B together will make 100 baskets in 4 days.
Alternate Solution:
In 12 days, A and B together can make (200 + 100) baskets = 300 baskets
∴ in 4 days they can make 100 baskets.

15. (a) 1M = 2W
(8M + 4W) × (6 days – 2 days) = (4M + 8W) × x days
(8 × 2W + 4W) × (6 – 2) days
= (4 × 2W + 8W) × x days
(16 + 4)W × 4 days = 16W × x days

∴ x = $\dfrac{20\times 4}{16}$ = 5 days [$M_1 D_1 = M_2 D_2$]

16. (b) Given : $2M_1 = 3M_2$,

∴ Efficiency: $\dfrac{M_1}{M_2}=\dfrac{3}{2}$

Let number of men in second group = n and hours needed by them = h
∴ Total work by first group = efficiency × hour × M_1
= 3 × 25 × n
Also, $2(1^{st}$ group work) = 2^n group work
⇒ 2(3 × 25 × n) = 2 × n × h
⇒ h = 75

17. (d) Part of the tank filled by the three pipes working simultaneously in one hour is = $\dfrac{1}{5}+\dfrac{1}{6}-\dfrac{1}{12}=\dfrac{17}{60}$

i.e. it takes $\dfrac{60}{17}$ hours to fill up the tank completely.

Now, $\dfrac{1}{2}$ of the tank is filled with all the pipes open, simultaneously together in $\dfrac{60}{17}\times\dfrac{1}{2}$ = $1\dfrac{13}{17}$ hours

18. (b) A and B can complete work in 6 days
A can complete in 18 days
Let B can complete in x days
∴ One day work be equal to

$$\frac{1}{6}=\frac{1}{18}+\frac{1}{x}$$

$$\frac{1}{6}=\frac{x+18}{18x}$$

3x = x + 18
x = 9 days

19. (a) Work done by 1st tap in one minute = $\dfrac{1}{30}$

Work done by 2nd tap in one minute = $\dfrac{1}{45}$

Both tap one minute work = $\dfrac{1}{30}+\dfrac{1}{45}=\dfrac{45+30}{1350}$

$$=\frac{75}{1350}=\frac{1}{18}$$

Both tap will empty the tank in 18 minutes.
Alternate Solution:
Let total work = 90 units = LCM (30, 45)

∴ A can empty $\dfrac{90}{30}$ units in 1 minute

B can empty $\dfrac{90}{45}$ units in 1 minute

∴ Together they can empty 90 units in $\dfrac{90}{3+2}$

= 18 minutes

20. (b) Let x additional men employed.
117 men were supposed to finish the whole work in
46 × 8 = 368 hours.

But 117 men completed $\dfrac{4}{7}$ of the work in 33 × 8

= 264 hours

∴ 117 men could complete the work in 462 hours.

Now $(117 + x)$ men are supposed to do $\frac{3}{7}$ of the work, working 9 hours a day, in $13 \times 9 = 117$ hours, so as to finish the work in time.

i.e. $(117 + x)$ men are supposed to complete the whole work in $117 \times \frac{7}{3} = 273$ hours.

∴ $(117 + x) \times 273 = 117 \times 462$

⇒ $(117 + x) \times 7 = 3 \times 462$

⇒ $x + 117 = 3 \times 66 = 198 \Rightarrow x = 81$

∴   Required number of additional men to finish the work in time = 81.

21.   (a)   Let A and B together work for x minutes than amount of water filled in the period $= x\left(\frac{1}{30} + \frac{1}{40}\right) = \frac{7x}{120}$

Remaining part $= 1 - \frac{7x}{120} = \left(\frac{120 - 7x}{120}\right)$

Work done by A in $(10 - x)$ minutes $= \frac{120 - 7x}{120}$

$$= 1 - \frac{7x}{120}$$

$\frac{7x}{120} + \frac{10 - x}{30} = 1$ or $7x + 40 - 4x = 120$

$$3x = 120 - 40 = 80$$

$$x = 26\frac{2}{3} \text{ min}$$

22.   (a)   (A + B)'s one day's work $= \frac{1}{5}$th work

Let A can do job in x days. Then,

A's one day's work $= \frac{1}{x}$th work

and B's one day's work $= \frac{1}{5} - \frac{1}{x} = \frac{x - 5}{5x}$th work

Now, (2)A's work $+ \left(\frac{1}{3}\right)$B's work $= \frac{1}{3}$rd work

$$\Rightarrow \frac{2}{x} + \frac{1}{3}\left(\frac{x - 5}{5x}\right) = \frac{1}{3}$$

$$\Rightarrow x = \frac{25}{4} = 6\frac{1}{4} \text{ days}$$

23.   (b)   Part of tank filled by all three pipes in 1 minute

$$= \frac{1}{30} + \frac{1}{45} - \frac{1}{60} = \frac{6 + 4 - 3}{180} = \frac{7}{180}$$

$$\text{Time taken} = \frac{180}{7} \text{ minutes}$$

$$= \frac{180}{7 \times 60} = \frac{3}{7} \text{ hour}$$

24.   (b)   A's one day's work $= \frac{1}{8}$th work

B's one day's work $= \frac{1}{3}$rd work

A's 4 day's work $= 4 \times \frac{1}{8} = \frac{1}{2}$nd work

In next two days, total wall $= \frac{1}{2} + 2\left(\frac{1}{8}\right) - 2\left(\frac{1}{3}\right)$

$$= \frac{1}{12}\text{th wall}$$

Remaining wall $= 1 - \frac{1}{12} = \frac{11}{12}$th

Now, $\frac{1}{8}$th wall is built up by A in one day.

∴ $\frac{11}{12}$th wall is built up by A in $8 \times \frac{11}{12} = 7\frac{1}{3}$ days.

25.   (b) $(12 \times 20)\,M = (18 \times 16)\,W = (24 \times 18)\,C$

or, $240M = 288W = 432C$

or, $5M = 6W = 9C$

Work done by 8 women and 16 children in 9 days

$$= (8W + 16C) \times 9 = \left(8 \times \frac{5}{6}M + \frac{16 \times 5}{9}M\right) \times 9$$

$$= \left(\frac{40}{6}M + \frac{80}{9}M\right) \times 9 = \left(\frac{120M + 160M}{18}\right) \times 9 = 140\,M$$

∴   Remaining work

$$= 12\,M \times 20 - 140\,M$$

$$= 240\,M - 140 = 100\,M$$

∴   10 men can complete it in

$$= \frac{100}{10} = 10 \text{ days}$$

26.   (c)   A twice efficient, so if B taken $2x$ days to complete a work, then A taken x days to complete that work.

Now, B worked for 9 days and A for $(9 - 4) = 5$ days

So, $\frac{1}{x} \times 5 + \frac{1}{2x} \times 9 = 1$

$2x = 19$

So, B is 19 days

27.   (b)   Given that two boys can do the work in ten days, three girls can do it in five days

∴   One boy can do the work in $2 \times 10 = 20$ days

One girl can do the work in $3 \times 5 = 15$ days

∴ Number of days taken by a boy and a girl working together to finish the work

$$= \frac{1}{\frac{1}{15} + \frac{1}{20}} = \frac{60}{4 + 3} = \frac{60}{7} = 8\frac{4}{7} \text{ days}$$
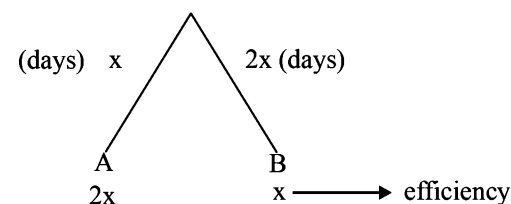
28.   (b) $1/8 + 1/12 + 1/C = 1/4$, we get C = 24 days

Now efficiency of A, B and C are in the ratio of

$$\frac{1}{8} : \frac{1}{12} : \frac{1}{24}$$

$3 : 2 : 1$, so share of C is $1/6 \times 1200 = 200$

29.   (c)

(days)   x   2x (days)

A   B

2x   x ⟶ efficiency

(The no. of days are indirectly proportional to the efficiency)
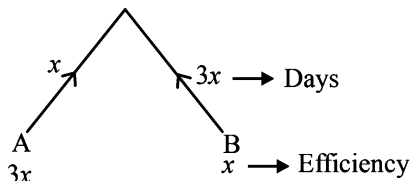Now Given that,
$2x = 24$
$x = 12$ days.

A and B finish the work together $= \dfrac{12 \times 24}{36} = 8$ days

30. (b) Let efficiency of B is x

Days are inversaly proportional to efficiency.
According to question
$3x - x = 40$
$2x = 40$
$x = 20$
Time taken by $A = x$ days $= 20$ days
Time taken by $B = 3x$ days $= 3 \times 20 = 60$ days

Time taken by A and B together $= \dfrac{20 \times 60}{80} = 15$ days

31. (a) 1 man $+1$ woman $+1$ boy $= \left(5 + \dfrac{5}{3} + 1\right)$ boys

$= \left(\dfrac{23}{3}\right)$ boys

$\therefore$ Required number of days
$= (5 \times 46 \times 3) \div 23 = 30$ days

32. (c) If they work for x hours
then, $(4 \times 5 \times 10) \times 2 = 2 \times 20 \times x$
$\Rightarrow x = 10$

33. (a) $\dfrac{\text{Work}}{\text{man} \times \text{days}} = \dfrac{\text{Remaining work}}{\text{men} \times \text{days}}$

$\dfrac{W}{24 \times 13} = \dfrac{W}{20 \times D}$

$20 \times D = 24 \times 13$

$D = \dfrac{24 \times 13}{20} = \dfrac{78}{5} = 15\dfrac{3}{5}$ days

34. (d) Let A replaced by C after x days, so A and B worked for

x days, and then B and C for $6\dfrac{4}{11} = 70/11$ days. So

$(1/15 + 1/25) \times x + (1/25 + 1/30) \times (70/11) = 1$
$(8/75) \times x + (7/15) = 1$
Solve, $x = 5$ days
So, B worked for $(5 + 70/11) = 125/11$ days
In 125/11 days, B did $(125/11) \times (1/25) = 5/11$ of work

35. (b) $\dfrac{1}{6} + \dfrac{1}{8} + \dfrac{1}{12} = \dfrac{1}{d}$

$d = \dfrac{8}{3}$ days

36. (c) $(1/12 + 1/15) + (1/12 + 1/20) = \dfrac{17}{60}$ (in 2 hrs this much tank is filled)

So in 6 hrs $\dfrac{51}{60}$ is filled. Remaining, $\dfrac{9}{60}$

$= \left(\dfrac{1}{12} + \dfrac{1}{15}\right) \times T$, so T = 1hr

so total $= 6 + 1 = 7$ hr

37. (b) Pipe A's work in $\% = \dfrac{100}{10} = 10\%$

Pipe B's work in $\% = \dfrac{100}{20} = 5\%$

Pipe C's work in $\% = \dfrac{100}{40} = 2.5\%$

All of them are opened for 2 hours + after 2 hours, tap
C is closed + After the 4th hour, tap B is also closed = 100
$\therefore (10 + 5 + 2.5) \times 2 + (10 + 5) \times 2 + X = 100$
$\therefore 35 + 30 +$ work by tap A alone $= 100$
$\therefore$ work by tap A alone $= 100 - 65 = 35\%$

38. (c) A's 1 day work $= \dfrac{1}{24}$

B's 1 day work $= \dfrac{1}{30}$

$(A + B)$'s 6 day work $= \dfrac{9}{20}$

Remaining work $= \dfrac{11}{20}$

it is done by A & C in 11 days.

$\therefore 11 \times \left(\dfrac{1}{24} + \dfrac{1}{C}\right) = \dfrac{11}{20}$

$\Rightarrow \dfrac{1}{24} + \dfrac{1}{C} = \dfrac{1}{20}$

$\Rightarrow \dfrac{1}{C} = \dfrac{1}{120}$

$\Rightarrow$ C can do work in 120 days.

39. (b) Let T is the time taken by the pipes to fill the tank
Let capacity of tank = LCM of (12, 18, 24) = 72 units
$\therefore$ P in 1 min can fill 6 units
Q in 1 min can fill 4 units
R in 1 min can fill 3 units
$\therefore (10) t + 3 (t - 12) = 72$
$13 t = 108$

$\Rightarrow t = 8\dfrac{4}{13}$ hours

40. (b) Let A takes x hours, then B = (x+40) hours

$\dfrac{1}{x} + \dfrac{1}{x + 40} = \dfrac{1}{15}$

Solve, x = 20

41. (b) $(A + C) = \dfrac{1}{10} + \dfrac{1}{15} = \dfrac{1}{6}$. They worked for 4 days so did

$\dfrac{1}{6} \times 4 = \dfrac{2}{3}$ of work

Remaining work $= 1 - \dfrac{2}{3} = \dfrac{1}{3}$

Now A left, B and C working

$(B + C) = \left(\dfrac{1}{12} + \dfrac{1}{15}\right) = \dfrac{9}{60} = \dfrac{3}{20}$. They worked for x

days and completed $\dfrac{1}{3}$ rd of work so $\dfrac{3}{20} \times x = \dfrac{1}{3}$,

So x $= \dfrac{20}{9}$ days

Total $= 4 + \dfrac{20}{9} = \dfrac{56}{9} = 6\dfrac{2}{9}$ day

42. (c) $\left(\dfrac{4}{12} - \dfrac{3}{15}\right) \times t = 1$

$t = \dfrac{15}{2}$ minute - in this time the tank will be filled. So

the capacity $= \left(\dfrac{15}{2}\right) \times 10 = 75$ litre

43. (c) Let total work is w and it is given that one-third of the work is completed after 30 days. Means

$M \times D = 30 \times 30 = \dfrac{W}{3}$, so total work $= 30 \times 30 \times 3$

$2700 = 30 \times 30 + (30 + p) \times 30$, so we get

$P = 30$ (p = additional men)

44. (c) Let P takes x minutes to fill the tank alone, then Q will take 4x minutes to fill the tank

$4x - x = 45, x = 15$

So P will take 15 minutes and Q will take 60 minutes to fill the tank. Both will fill the tank in

$\dfrac{60 \times 15}{75} = 12$ minutes

45. (c) Efficiency ratio A and B = 5 : 6

And time ratio of A and B = 6 : 5

i.e. in 1 day A and B together do 6 + 5 = 11 units work

Now,

$\dfrac{\text{Work done by B}}{\text{Work done by A}} = \dfrac{6 \times x}{5 \times (x + 8)} = \dfrac{2}{3}$

$x = 10$

B does $10 \times 6 = 60$ units work

A does $(10 + 8) \times 5 = 90$ units work

So, total work i.e. $60 + 90 = 150$ units will be completed

by A and B together in $\dfrac{150}{11}$ i.e. $13\dfrac{7}{11}$ days

46. (b) Let the C do in one day = 4y work

Let the D do in one day = 5y work

2 day work of C + D = 9y

In 44 days they will complete $9y \times 22 = 198$ y

In another $\dfrac{1}{2}$ days 2y work will be done

C will take $= \dfrac{200y}{4y}$ days = 50 days

D will take = 40 days

C and D will complete work together in

$= \dfrac{50 \times 40}{90} = \dfrac{200}{9}$

According to condition

$\dfrac{200}{9x} + \dfrac{200}{9 \times 2x} = 1$

$\dfrac{400 + 200}{18x} = 1 \quad \Rightarrow x = 33\dfrac{1}{3}$

47. (a) Let E do work in 4x days

Let F do work in 5x days

$\dfrac{24}{5x} + \dfrac{24}{4x} + \dfrac{20}{\dfrac{100}{3}} + \dfrac{20}{\dfrac{200}{3}} = 1$

$24 = \left(\dfrac{9}{20x}\right) + \dfrac{60}{100} + \dfrac{60}{200} = 1$

$\dfrac{24 \times 9}{20x} = 1 - \dfrac{180}{200}$

$\dfrac{24 \times 9}{20x} = \dfrac{1}{10}$

$x = 108$

Together E and F can do work in

$= \dfrac{4 \times 108 \times 5 \times 108}{9 \times 108}$

$= 240$ days

Required difference $= \dfrac{240}{4 \times 108} - \dfrac{240}{5 \times 108}$

$= \dfrac{240}{108} \times \dfrac{1}{20} = \dfrac{1}{9}$

48. (c) P will complete work in 15 days.

Q will complete work in 10 days.

They together will complete whole work

$= \dfrac{15 \times 10}{25} = 6$ days

P and Q together worked for $= 6 \times \dfrac{2}{3} = 4$ days

49. (e) Q will complete the work alone in

$\dfrac{3}{4} \times 72 = 54$ days

P $\Rightarrow 72$ ⟍　　⟋ 3
　　　　　216
Q $\Rightarrow 54$ ⟋　　⟍ 4

Let total units of work = 216

No. of units done by P in 1 day = 3

No. of units done by Q in 1 day = 4

Total work done in 2 days = 7 units

Work done in 60 days = $7 \times 30 = 210$ units

Remaining work = 6 unit

Work done by P in 1 day = 3 unit

Remaining work done by Q $= \dfrac{3}{4}$ day.

$\therefore$ Total days taken $= \left(60 + 1 + \dfrac{3}{4}\right)$ days

$= 61\dfrac{3}{4}$ days

50. (a) $$\frac{\text{Work}}{\text{man} \times \text{days}} = \frac{\text{Remaining work}}{\text{men} \times \text{days}}$$

$$\frac{W}{24 \times 13} = \frac{W}{20 \times D}$$
$$20 \times D = 24 \times 13$$

$$D = \frac{24 \times 13}{20} = \frac{78}{5} = 15\frac{3}{5} \text{ days}$$

51. (a) Works was done by A and B in 1 day

$$= \frac{1}{8} + \frac{1}{12} = \frac{5}{24}$$

2 day's work of A and B $= \dfrac{10}{24}$

After 2 day's A left the work

∴ Remaining work $= 1 - \dfrac{10}{24} = \dfrac{14}{24}$

One day work of B and C toegther

$$= \frac{1}{12} + \frac{1}{15} = \frac{9}{60}$$

So, the number of days required by B and C to finish work

$$= \frac{14/24}{9/60} = \frac{14}{24} \times \frac{60}{9} = \frac{35}{9}$$

∴ Total days to complete the work

$$= 2 + \frac{35}{9} = \frac{53}{9} = 5\frac{8}{9} \text{ days}$$

52. (c) According to the formula,

$$\frac{M_1 D_1 T_1}{W_1} = \frac{M_2 D_2 T_2}{w_2} \qquad \text{(by technique 1)}$$

Given $M_1 = 105$, $D_1 = 25$, $T_1 = 8$, $W_1 = \dfrac{2}{5}$

Now, let the additional men be x.

Then, $M_2 = 105 + x$, $T_2 = 9$

$D_2 = 25$

And $W_2 = 1 - \dfrac{2}{5} = \dfrac{3}{5}$

On putting these values in the above formula

$$\frac{105 \times 25 \times 8}{2/5} = \frac{(105 + x) \times 25 \times 9}{3/5}$$

$$= \frac{105 \times 8}{2} = \frac{(105 + x) \times 9}{3}$$

$$= 105 \times 4 = (105 + x) \times 3$$

$$= 105 \times 4 = 105 \times 3 + 3x$$

$$\Rightarrow 3x = 105$$

∴ $x = 35$ men

53. (a) Let the required time be T hours. Now part filled by A in $(10 + T)$ hours + part filled by B in $(10 + T)$ hours + part empty by C in 10 hours = 1

$$\Rightarrow \frac{T+10}{15} + \frac{T+10}{20} - \frac{10}{25} = 1 \Rightarrow T = 2\text{hrs}$$

54. (a) $60E = 120D = 100T = 1$ unit can finish a work in 360 days.

Also $10E + 40D + 50T = \dfrac{1}{6} + \dfrac{1}{3} + \dfrac{1}{2}$ unit = 1 unit

Therefore 10 engineers, 40 doctors and 50 teacher working together will complete the same work in same time i.e. 360 days.

55. (d) According to question,

Time taken by A in completing 1/3 of work

$$= 12 \times \frac{1}{3} = 4 \text{ days}$$

4 day = time taken by B in completing 1/2 of work

B alone will complete the work = 8 days

Required time

$$\Rightarrow \frac{12 \times 8}{20} = \frac{24}{5} \text{days}$$

56. (b) Let 180 units be the capacity of tub

Time	Capacity	Work done (in unit)
P : 10 →		→ 18
Q : 15 →	180	→ 12
R : ? →		→ ?

P and Q together can fill tank in $\dfrac{180}{18 + 12} = 6$ min

∴ we can say,

Work done by 'R' in 6 min = work done by (P & Q) together in 4 minutes

$$\Rightarrow \quad 6 \cdot x = 4 \times (18 + 12)$$
$$\Rightarrow \quad x = 20$$

∴ R is doing 20 units of work in 1 minute

∴ R requires $\dfrac{180}{20} = 9$ minutes to empty tank

57. (b) One day work of each one man, one women and one child respectively

$$= \frac{1}{12}, \frac{1}{18} \text{ and } \frac{1}{24}$$

∴ Remaining work

$$\therefore = 1 - \left(\frac{1}{18} \times 3 + \frac{1}{24} \times 4\right) = \frac{2}{3}$$

∴ 2/3 work will be completed in one day by

$$= 12 \times 2/3 = 8 \text{ men}$$

58. (b) Speed of boat going downstream = 30 + 5 = 35 kmph

Speed of boat going upstream = 30 − 5 = 25 kmph

Speed of approach = 35 + 25 = 60 kmph

Distance to be travelled = 300 km

Time required = 300/60 = 5 hours

59. (a) Given, A certain work is completed by A and B together in 10 days.

Let the number of days taken by A alone be 'a' and by B alone be 'b'

In 1 day,

A completes 1/a part and B completes 1/b part.

$1/a + 1/b = 1/10$ ----- (1)

Now, if A had worked at twice the speed and B had worked at half his speed it would have taken them 8 days to finish the work.

Thus, $2/a + 1/2b = 1/8$ ----- (2)

$2 \times (1) - (2)$

$\Rightarrow$ $2/b - 1/2b = 1/5 - 1/8$

$\Rightarrow$ $3/2b = 3/40$

$b = 20$ days

60. (d) Let the capacity of the tank be C

Speed of inlet tap $= C/16$

Speed of outlet tap $= C/8$

Difference in speed $= C/8 - C/16 = C/16$ hours

Time to empty 3/4th of the tank $= (3C/4) / C/16$

$= 3C/4 \times 16/C = 12$ hours

61. (d) Let us suppose Women give 10 units a day

Therefore, a man gives $1.4 \times 10 = 14$ units a day

Similarly, a child gives $0.6 \times 10 = 6$ units a day

Total job (units) = (7 days × per day contribution)

$= 7 \times (3 \times 14 + 5 \times 10 + 4 \times 6) = 812$ units

New combination $= 2M + 7W + 3C$

Contribution per day $= 2 \times 14 + 7 \times 10 + 3 \times 6 = 116$ units

Days required to complete the job $= 812/116 = 7$ days

62. (d) Y Can complete work alone in

$= 40 \times \dfrac{5}{6} = 33$ days (approx)

Let Z alone can complete work in 't' days.

ATQ,

$\dfrac{8}{33} + \dfrac{20}{t} = 1$

$\Rightarrow \dfrac{20}{t} = \dfrac{25}{33} \qquad \Rightarrow X = \dfrac{20 \times 33}{25} = 26$ days (approx)

63. (a) Let distance between A to B and B to C be 'x' and 'y' respectively.

ATQ,

$60 = \dfrac{300}{\dfrac{x}{70} + \dfrac{y}{50}}$

$50x + 70y = 300 \times 70 \times 50 \times \dfrac{1}{60}$

$50x + 70y = 17500$

$5x + 7y = 1750$ ...(i)

and $x + y = 300$ ...(ii)

Solving eq (i) − 5 × eq ...(ii)

$\Rightarrow y = 125$ km and $x = 175$ km

64. (d) Let the time taken by A and B be 4x days and 3x days respectively.

$\Rightarrow$ $4x = 20$ days

$\Rightarrow$ $x = 5$ days

B's time $= 3 \times 5 = 15$ days

Time taken by both together to complete the work

$= \dfrac{20 \times 15}{20 + 15}$ $\left[\text{use } \dfrac{a \times b}{a + b} \text{ for two persons} \right]$

$\simeq 8.5$ days.

65. (e) Let the efficiency of R and P be 3x and 2x unit/ day respectively

Efficiency of Q = 6x units/day

Total work $= \dfrac{12}{5} \times 2 \times 5x = 24x$ units

Required time $= \dfrac{24x}{9x} = 2\dfrac{2}{3}$ days

66. (b) Lets efficiency of P is x unit/day and Q's efficiency is 3x unit/day

So, Q work for 18 days and P work for 17 days

ATQ−

Total work $= 18 \times 3x + 17 \times x = 71x$

Efficiency of R $= \dfrac{71x}{48} = 1.47x \approx 1.5x$ unit/day

(P + R) together $= \dfrac{71x}{(x + 1.5x)} = 28$ days (approx)

67. (d) One day work of women = half of work done by men in one day

Let efficiency of one women = w unit/day

Man's efficiency = 2w unit/day

Total work $= (8 \times 2w + 5 \times w) \times 7$

$= 147$ w unit

9 men and 3 women start work for 4 days

work done in 4 days $= (9 \times 2w + 3 \times w) \times 4$

$= 84w$

4 women replace 4 man

$= (5 \times 2w + 7 \times w) = 17w$

Days required $= \dfrac{147w - 84w}{17w} = \dfrac{63w}{17w} = 3.7$ days

68. (d) Let marked price be ₹x

$\therefore$ Selling price $= \dfrac{9x}{100}$

But selling price $= 2160 \times \dfrac{125}{100} = ₹ 2700$

$\therefore$ Marked price $= 2700 \times \dfrac{100}{90} = ₹ 3000$

69. (c)

	Efficiency		Total work
	3 ← Raja → 20		
			60
	+ 4 ← Baja → 15		

7 ← A + B

Work done by Raja in last 6 days $= 6 \times 3 = 18$ work.

Remaining work done by Raja + Baja

$= 60 - 18 = 42$ work

Baja left the work after $= \dfrac{42}{7} = 6$ days.

70. (e) Let Shahu, Yash and Dixit can finish the whole work in X, Y and Z days.

Shahu (X)

Yash (Y)

Dixit (Z)

ATQ,

$(X + Y)A + (X + Y - Z)\left(\dfrac{5A + 24}{5}\right) = 72$

$7A + 5\left(\dfrac{5A + 24}{5}\right) = 72$

$12A = 48 \Rightarrow A = 4$

(X + Y + Z) work for

$= 4 + 4\dfrac{4}{5} = 8\dfrac{4}{5}$ days

71. (e) Let efficiency of Rajan be x units/day

So, efficiency of Raj $= x \times \dfrac{200}{100}$

$= 2x$ units/day

Now, total works $= (x + 2x) \times \dfrac{8}{3} = 8x$ units

Hence, efficiency of Rajeev $= \dfrac{8x}{9}$ units/day

Work completed by Rajeev and Rajan together in 4

days $= \left(\dfrac{8x}{9} + x\right) \times 4 = \dfrac{68x}{9}$ units

Required portion $= \dfrac{\dfrac{68x}{9}}{8x} = \dfrac{17}{18}$

72. (e) Distance covered by bus

$= \dfrac{25}{400} \times 1280 = 80\,\text{km}$

Distance covered by motorcycle

$= \dfrac{25}{100} \times 1280$

$= 320\,\text{km}$

Distance covered by bicycle

$= \dfrac{30}{100} \times 1280 = 384\,\text{k.m.}$

And distance covered by train

$= [1280 - (80 + 320 + 384)]$

$= 1280 - 784 = 496\,\text{km}$

Required time $= \dfrac{80}{80} + \dfrac{320}{80} + \dfrac{384}{64} + \dfrac{496}{124}$

$= 1 + 4 + 6 + 4 = 15$ hours.

73. (e) Ratio of efficiency of Satish to Charan is 3 : 2

Let, In 8 days they complete $= (3 + 2) \times 8 = 40$ units

So, total work $= 40 \times \dfrac{12}{5}$ units

Time taken by Charan alone to complete whole work

$= \dfrac{40 \times 12}{5 \times 2} = 48$ days

74. (d) Hence

$3W = 2M = 4C$

$\therefore (14M + 12W + 12C) = (14 + 8 + 6)M = 28\,\text{Man}$

Total unit of work $= 28 \times 24$

$\therefore 28 \times 24 = x \times 12$

$x = \dfrac{28 \times 24}{12} = 56$

Total no. of Man requried for additional labour

$= 56 - 28 = 28\,\text{Man}$

75. (e) L.C.M. of 72 and 96 $= 288$

Total work $= 288$ unit

$A = \dfrac{288}{72} = 4\,\text{unit}$

$B = \dfrac{288}{96} = 3\,\text{unit}$

One-third of the total work $= \dfrac{288}{3} = 96\,\text{unit}$

According to the question,

$4 \times x + 3 \times (x + 2) = 96$

$4x + 3x + 6 = 96$

$\Rightarrow 7x = 90$

$\Rightarrow x = \dfrac{90}{7} = 12\dfrac{6}{7}$ days.

76. (e) Part of tank P filled by pipes A, B and C in 1 minute

$= \dfrac{1}{20} + \dfrac{1}{30} + \dfrac{1}{60} = \dfrac{3 + 2 + 1}{60} = \dfrac{6}{60} = \dfrac{1}{10}$

$\Rightarrow$ The tank will be completely filled in $= 10$ minutes

$\Rightarrow$ Tank will be 60% filled in $= 60\%$ of $10 = 6$ minutes

Now, part of milk filled by pipes A and B in 1 minutes

$= \dfrac{1}{20} + \dfrac{1}{30} = \dfrac{3 + 2}{60} = \dfrac{1}{12}$

$\Rightarrow$ Part of milk filled in 6 minutes $= 6 \times \dfrac{1}{12} = \dfrac{1}{2}$

But, part of tank filled in 6 minutes $= 3/5$

$\Rightarrow$ Part of milk in the mixture $= \left(\dfrac{1}{2} \div \dfrac{3}{5}\right) = \dfrac{5}{6}$

$\therefore$ Only option (e) satisfies the two blanks in the question.

77. (e) Part of tank filled by pipes A and B in 1 minutes

$= \dfrac{1}{20} + \dfrac{1}{30} = \dfrac{3 + 2}{60} = \dfrac{5}{60} = \dfrac{1}{12}$

$\Rightarrow$ Part of tank filled in 6 minutes $= 6 \times \dfrac{1}{12} = \dfrac{1}{2}$

$= 50\%$

$\because$ The tank was initially 30% filled, it is

$30 + 50 = 80\%$ filled after 6 minutes.

Similarly,

Part of tank filled by pipes B and C in 1 minute

$$= \frac{1}{30} + \frac{1}{60} = \frac{2+1}{60} = \frac{3}{60} = \frac{1}{20}$$

∵ The tank was initially 30% filled' so part of tank to be filled = 70 – 30 = 40% = 2/5

⇒ Time taken to fill 40% of tank

$$= \frac{2}{5} \times 20 = 8 \text{ minutes}$$

∴ Only option (e) satisfies the two blanks in the question.

78. **(a)** When pipes B and D were simultaneously opened. Part of tank filled in 1 minute

$$= \frac{1}{30} - \frac{1}{40} = \frac{4-3}{120} = \frac{1}{120}$$

⇒ Part of tank filled in 12 minutes

$$= 12 \times \frac{1}{120} = \frac{1}{10}$$

$$\Rightarrow \frac{1}{10} \times \text{Capacity of tank} = 20$$

⇒ Capacity of tank = 20 × 10 = 200 gallons.

∵ Pipe D can empty 1/40 part of tank 1 minutes

⇒ Rate at which pipe D can empty tank

$$= \frac{1}{40} \times 200 = 5 \text{ gallons/minute}$$

∴ Only option (a) satisfies the two blanks in the question.

79. **(b)** Pipe A was closed after 1 min., pipe B was closed after 2 minutes and pipe C was closed after 3 minutes

When the pipe C was closed, pipes D and E were also opened for 3 minutes each.

⇒ Part of tank filled in 3 minutes

$$= \left(1 \times \frac{1}{20}\right) + \left(2 \times \frac{1}{30}\right) + \left(3 \times \frac{1}{60}\right)$$

$$- \left(3 \times \frac{1}{40}\right) - \left(3 \times \frac{1}{60}\right) = \frac{1}{24}$$

∵ The pipe was initially $\frac{2}{5}$ part filled.

⇒ When pipe C was closed, part of tank filled

$$= \frac{2}{5} + \frac{1}{24} = \frac{48+5}{120} = \frac{53}{120}$$

Similarly,

When pipe E was closed, pipe D was opened for 4 minutes and pipe E for 5 minutes

⇒ Part of tank filled in 5 minutes

$$= \left(1 \times \frac{1}{20}\right) + \left(2 \times \frac{1}{30}\right) + \left(3 \times \frac{1}{60}\right) -$$

$$\left(4 \times \frac{1}{40}\right) - \left(5 \times \frac{1}{60}\right) = -\frac{1}{60}$$

This means that in 5 minutes $\frac{1}{60}$ part of the tank is emptied,

∵ The pipe was initially $\frac{2}{5}$ part filled.

⇒ When pipe E was closed, part of tank filled

$$= \frac{2}{5} - \frac{1}{60} = \frac{23}{60}$$

∴ Only option (b) satisfies the two blanks in the question.

80. **(a)** According to the question,

$$80 \times 24 = 32x + 48 \times \frac{50}{3}$$

$$1920 = 32x + 800$$

$$x = 35$$

81. **(c)** According to the formula,

$$\frac{M_1 D_1 T_1}{W_1} = \frac{M_2 D_2 T_2}{w_2} \quad \text{(by technique 1)}$$

Given $M_1 = 105$, $D_1 = 25$, $T_1 = 8$, $W_1 = \frac{2}{5}$

Now, let the additional men be x.

Then, $M_2 = 105 + x$, $T_2 = 9$

$D_2 = 25$

And $W_2 = 1 - \frac{2}{5} = \frac{3}{5}$

On putting these values in the above formula

$$\frac{105 \times 25 \times 8}{2/5} = \frac{(105+x) \times 25 \times 9}{3/5}$$

$$= \frac{105 \times 8}{2} = \frac{(105+x) \times 9}{3}$$

$$= 105 \times 4 = (105+x) \times 3$$

$$= 105 \times 4 = 105 \times 3 + 3x$$

$$\Rightarrow 3x = 105$$

∴ x = 35 men

82. **(c)** Let total work be 60 units (LCM of 12 and 7.5)
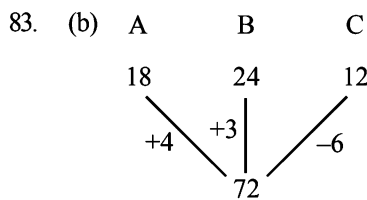
Efficiency of Panas = 5 units/ day

Efficiency of Panas and Abdul together = 8 units/ day

Efficiency of Abdul = 3 units/ day

Time taken by Abdul alone to do that Book Typing = 20 days

Time taken by Rekha alone = 23 days

83. (b) A   B   C

18   24   12

+4   +3   −6

72

∴ tank filled in 1 min = 1 unit

Total time = $\dfrac{72}{1}$ = 72 minutes

84. (d) P can fill in 4 hours = 240 minutes

Q can fill in 6 hours = 360 minutes

Let 720x be the volume of tank

(720 is the LCM of 240 and 360).

Quantity of water fillled by P in one minute $= \dfrac{720x}{240} = 3x$

Quantity of water filled by Q in 1 minute $= \dfrac{720x}{360} = 2x$

So P and Q together fill the tank $= \dfrac{720x}{5x} = 144$ minutes

By data, 156 minutes taken to fill the tank.

Hence, 12 minutes of extra fill is leaked by the hole.

For the first quarter, the hole will not come into effect.

Time for quarter of tank to fill $= \dfrac{180x}{5x} = 36$ minutes

Hence hole will leak for 120 minutes which will be filled by the pipes in 12 minutes

Hole leaks 3 litres per 4 minutes.

$120 \times \dfrac{3}{4} = 5x \times 12$

$90 = 60x$

$x = \dfrac{3}{2}$

Capacity of tank $= 720 \times \dfrac{3}{2} = 1080$ liters

85. (d) Volume of reservoir $= (80 \times 60 \times 6.5)\, m^3$

$= 31200\, m^3$

Area of square $= (0.20 \times 0.20)\, m^2$

$= 0.04\, m^2$

water flow rate 15km/r $= \dfrac{25}{6}$ m/s

time $= \dfrac{31200 \times 6}{.04 \times 25 \times 3600}$ hr $= 52$hr.

86. (c) Let the capacity of the tank be 96 units (LCM of 32 and 48)

Efficiency of tap A = 3 units/minute

Efficiency of tap B = 2 units/minute

$\dfrac{1}{6}$ th of the tank = 16 units

Required time $= \dfrac{16}{3+2} = 3\dfrac{1}{5}$ minutes

87. (c) Let M, W and B be the number of days taken by a man, a woman, and a boy each working alone to complete the work.

4 men and 6 women together can complete a piece of work in 4 days.

⇒ 4/M + 6/W = 1/4   ...(1)

2 man and 4 boys together complete the work in 8 days.

⇒ 2/M + 4/B = 1/8   ...(2)

6 women and 4 boys together can complete the work in 6 days

⇒ 6/W + 4/B = 1/6   ...(3)

On multiplying equation (2) by 2 and then subtracting from equation (1),

$4/M + 8/B = \dfrac{1}{4}$

$4/M + 6/W = \dfrac{1}{4}$

$-\qquad -\qquad -$

$8/B - 6/W = 0$

$3/W = 4/B$ ...(4)

Putting value in equation (3)

$\dfrac{6}{W} + \dfrac{4}{B} = \dfrac{1}{6}$

$\dfrac{6}{W} + \dfrac{3}{W} = \dfrac{1}{6}$

W = 54 days

$\dfrac{6}{B} = \dfrac{1}{12}$

⇒ B = 72 days

From equation 1,

⇒ M = 144/5 days

∴ 4 men, 6 women and 8 boys together can complete

the work in $\dfrac{4}{\dfrac{144}{5}} + \dfrac{6}{54} + \dfrac{8}{72} = \dfrac{36}{13}$ days.

88. (b) Let the total work be 60 units (LCM of 12 and 15)

Efficiency of Shivam = 5 units/hr

Efficiency of Deepak = 4 units/hr

twice of the work = 60 × 2 = 120 units

Required time $= \dfrac{120}{5+4} = \dfrac{120}{9} = 13\dfrac{1}{3}$ hr.