TIME AND DISTANCE , TIME AND WORK, Pipes and Cisterns

Time and Work Solved Problems on Basics:-

1.   A can do a work in 10 days. What is A's 1 day work?
Ans: $1/10^{th}$ of work

2.   Two people can do a work in 10 days. What is 1 day 1 man work?
Ans: Since it is given as 2 people can do a work in 10 days, total work is 10 * 2 = 20 units of work.
        Therefore, one day one man work = 1/total work = 1/20 units of work

3.   Three men can do a work in 15 days. One man can do a work in how many days?
Ans: Since it is given as 3 people can do a work in 15 days, total work is 15 * 3 = 45 units of work.
        Therefore, one man can complete the work in 45 days

4.   One man one day work is 1/25. In how many days, can he finish the work?
Ans: Number of days required = 1/(1/25) = 25 days

Difficulty Level – Medium :-

 1.   A can work on 1km railway track in 1 day. In how many days, will he able to complte the work on 12km railway track?

Soln: no. of days = total work / work done in 1 day
        Therefore, no. of days taken = 12/1 = 12 days

 2.   A can complete the work in 15 days. What fraction of work will be completed in 1 day?

Soln.:   Let the total work is 1 unit.
Work in 1day = total work/no. of days to complete
                        = $1/15^{th}$ of work

 3.   A can do a piece of work in 3 days and B can do a piece of work in 5 days. In how many days will the work be completed if both A and B work together?

Soln.: **Using formula:**
                Work done by A in 1 day = 1/3
                Work done by B in 1 day = 1/5
                Total work done by A and B in 1 day = 1/3 + 1/5 = 8/15

Therefore, no. of days to complete work by A and B together = 1/(Total work) = 1/(8/15) = 15/8 days which is less than 3 and 5

Using shortcut/analysis/assumption

Let us consider the total work be 15 units (LCM of 3 and 5)
So work done by A in 1 day = 15/3 = 5 units
Similarly work done by B in 1 day = 15/5 = 3 units
So total work done by A and B in 1 day = 5 + 3 = 8 units
Therefore, no. of days to complete total work i.e. 15 units = total work/work done in 1 day = 15/8 days

Note:

a. Work done by A and B in 1 day **will always be greater than** that of A and B individually

b. No. of days taken by A and B together **will always be less than** that of A and B individually

Problems: -

Paper-I

1) A pipe can fill a tank in 15 hrs. The tank develops a hole and 10% of water leaks out. The pipe will now fill the bank in _____ .
a) 16 hrs 40 minutes   b) 18 hrs 40 minutes
c) 20 hrs   d) 17 hrs 30 minutes   Ans :a

2) A 125 metres long train overtakes a man walking at the rate of 4 kg/hr, parallel to the line in the same direction, in 9 seconds. The speed of the train is _____   km/hr.
a) 48   b 54   c) 80 d) 100   Ans:b

3) A clerk walks from his house at 4 km/hr and reaches his office 5 minutes late. If his speed is 5 km/hr , he will reach his office 10 minutes early. How far is his from his home?
a) 5KM   b) 5/12 KM   c) 5/2 KM   d) 15 KM   Ans : a

4) A group of 10 students working an hour per day complete a work in 12 days. 12 students in the group working one hour per day will be able to finish it in _____ days
a) 8   b) 9   c) 10   d) 11   Ans:c

5) Two taps A and B fill a tank separately in 24 minjutes and 40 minutes respectively and a waste pipe C releases 30 litres per minutes. If all the pipes are opened the tank is filled in a hour. The capacity of the tank is _____ litres
a) 750   b) 900   c) 800   d) 600 Ans : d

6) Ravi rows a distance of 1 km down the stream in 10 minutes and takes 30 minutes to cover the same distance up stream. The speed of the stream is _____ km per hour.

a) 5   b) 3   c) 2   d) 4 Ans : c

7) Meena can type 500 words in 10 minutes and Leena can type 400 words in 10 minutes. They can together type 3600 words in _____ minutes.
a) 50   b) 40   c) 80   d) 100   Ans: b

8) It takes an hour for a saree to dry in the sun. 25 such sarees will dry in _____
a) 50 hrs   b) 20 hrs   c) 1 hr   d) 625 hours   Ans : c

9) A moneky ascends a greased pole 21 m high. In the first minute he ascends 5 m and in the next minutes he descends 3 m.   If he continues this process, in how many minutes will he reach the top?
a) 17 minutes   b) 10.5 minutes   c) 21 minutes   d) 40 minutes   Ans: a

10) Two pipes A and B fill a cistern in 24 minutes and 32 minutes respectively. Assuming that both pipes are opened simultaneously, when must the first tap be turned off so that the cistern may be filled in 16 minutes?
a) after 10 minutes   b) after 12 minutes   c) after 8 minutes   d) after 16 minutes   Ans:b

11) A train running at a speed of 54 km/hr passes a signal post in 18 seconds. The length of train is
a) 432 m   b) 150 m   c) 120m   d) Data inadequate   Ans : c

12) A car is 25 km ahead of a scooter. The car travelling at 40 km / hr and the scooter at 50 km / hr. The scooter will overtake the car after _____
a) 1 ½ hr   b) 2 ½ hr   c) 3 ½ hr   d) 3 hrs.   Ans : b

13) Hari singh can cover a circular path of radius 21 m in 44 sec. He will cover a distance of 3 km in _____

   a) 16 minutes 20 seconds b) 16 minutes 40 seconds   Ans : b
   c)18 minutes 00 seconds   d) 18 minutes 30 seconds

14) Two cars start from one point and move along two roads at right angles to each other. Their speeds are 36 km/hr and 48 km /hr respectively. After 15 seconds the distance between them will be
a) 400 m   b) 150 m   c) 300 m   d) 250 m   An s : d

15) Ram, Mohan and Hari can do a work in 15 dayhs, 6 days and 10 days respectively. All the three can together finish three times of that work in _____ days
a) 21   b) 18   c) 9   d) 15   Ans : c

16) A,B, and C are employed to do a piece of job for Rs.529.   A and B together are supposed to do 19/23 of the work . C should be paid _____
a) Rs.115   b) Rs.92   c) Rs.200   d) Rs.250   Ans : b

17)A and B undertook to do a piece of work for Rs.4500. A alone could do it in 3 days and B in 12 days. with the help of C, they finish the work in 4 days. The share of C in the money is _____
a)Rs.2250   b) 1500   c) 750   d) Rs.375   Ans: c

18) A tank has a capacity of 240 litres. A pipe can empty 1/4th of the tank in 5 minutes and another pipe can empty 1/3rd of the tank in 6 minutes. The tank is filled and both the pipes are opened for 3 minutes . How much of the water is now left in the tank?
a) 160 litres b) 164 litres   c) 196 litres d) 200 litres   Ans: b

19) Hira, Radhu and Kalu working alone can do a piece of work in 9,8 and 6 days respectively. They jointly finish the work and earn Rs.522. The earnings should be divided in the ratio of
a) 6:9:8   b) 9:8:6   c) 8:9:12   d) 6:8:9   Ans : c

20) Javed walks at the rate of 3Km/hr for 2 hours and then at the rte of 2 km/hr for 3 hours. His average speed is _____ Km/hr
a) 4   b) 2.4   c) 2.5   d) 5   Ans: b

21) Rohit can row 18 km in 4 hrs down stream but while returning h takes 12 hours. The speed of the water current is
a) 1.5 km/hr   b) 4 km / hr   c) 2 km / hr   d) 3 km/hr   Ans: a

22) Two persons move towards each other form two places 55 km apart. One moves at a speed of 12 km/hr and other at 10 km/hr. They will be first 11 km apart from moving for
a) 3 hrs b) 2 hrs c) 6 hrs d) 4hrs   Ans : b

23) Sixteen men complete a work in fifteen days. Twenty four children can do the same work in twenty days. In how many days will eight men and eight children together complete the same job?
a) 16 b) 15 c) 20   d) None of these   Ans: c

24) Kishan cycles at a speed of 8 km/hr . After every 10 km, he rests for 20 minutes. How long will he take to travel a distance of 40 Km?
a) 6 hrs 20 min   b) 8 hrs   c) 6 hrs   d) 5 hrs   Ans:c

25) Three pipes are connected to a tank. Pipes A and B connected with tubewells can fill the tank in 10 hrs and 12 hrs respectively, while pipe C meant for watering the garden can empty the tank in 6 hrs. At 7 a.m. all the three pies are opened. One fourth of the tank will be filled at _____
a) 9 p.m. b) 10 p.m . c) 8 p.m. d) 11 p.m.   Ans: b

26) Shivani can do a piece of work in 16 days, Babu in 24 days and with the help of Sita, they finish it in 8 days. Sita can alone do it in
a) 40 days b) 60 days c) 48 days d) 24 days   Ans:c

27) A and B can do a piece of work in 24 days, B and C can do it in 18 days and A and C in 12 days. Working together they will finish the work in nearly
a) 9 days b) 10 dys c) 11 days and d) 8 days   Ans:c

28) Ram can complete a work in 12 days, while Rajan can finish it in 18 days.   Ram works on it for 8 days and then Rajan starts working on it. The work will be finished in
a) 6 days b) 7 days c) 8 days d) 9 days   Ans : a

PAPER - II

1. A can do a piece of work in 30 days while B alone can do it in 40 days. In how many days can A and B working together do it ?(a) 17 1/7 (b) 27 1/7 (c) 42 3/4 (d) 70

2. A and B together can complete a piece of work in 35 days while A alone can complete the same work in 60 days. B alone will be able to complete the same work in :
(a) 42 days (b) 72 days (c) 84 days (d) 96 days

3. A can do a piece of work in 7 days of 9 hours each and B can do it in 6 days of 7 hours each. How long will they take to do it, working together 8 2/5 hours a day ?
(a) 3 days' (b) 4 days (c) 4 1/2 days (d) None of these

4. A can do a piece of work in 15 days and B alone can do it in 10 days. B works at it for 5 days and then leaves. A alone can finish the remaining work in :
(a) 13/2 (b) 15/2 days (c) 8 days (d) 9 days

5. A can do 1/3 of the work in 5 days and B can do 2/5 of the work in 10 days. In how many days both A and B together can do the work?
(a) 7 ¾ (b)8 4/5 (c) 9 3/8 (d) 10

6. A can do a piece of work in 80 days. He works at it for 10 days and then B alone finishes the remaining work in 42 days. The two together could complete the work in :
(a) 24 days (b) 25 days (c) 30 days (d) 35 days

7.A and B can together finish a work in 30 days. They worked at it for 20 days and then B left. The remaining work was done by A alone in 20 more days. A alone can finish the work in :
(a) 48 days (b) 50 days (c) 54 days (d) 60 days

8.A and B can do a piece of work in 45 days and 40 days respectively. They began to do the work together but A leaves after some days and then B completed the remaining work in 23 days. The number of days after which A left the work was:
(a) 6 (b) 8 (c) 9 (d) 12

9. A does half as much work as B in three-fourth of the time. If together they take 18 days to complete the work, how much time shall B take to do it ?
(a) 30 days (b) 35 days (c) 40 days (d) none of these

10. A can do a certain job in 12 days. B is 60% more efficient than A. The number of days, it takes B to do the same piece of work, is :
(a) 6 (b) 6 ¼ (c) 7 ½ (d) 8

11. A can do a certain job in 25 days which B alone can do in 20 days. A started thework and was joined by B after 10 days. The number of days taken in completing the work was :
(a) 12 ½ (b) 14 2/9 (c) 15 (d) 16 2/3

12. A is twice as good a workman as B and together they finish a piece of work in 14 days. The number of days taken by A alone to finish the work, is :
(a) 11 (b) 21 (c) 28 (d) 42

13. A is thrice as good a workman as B and takes 10 days less to do a piece of work than B takes. B alone can do the whole work in :
(a) 12 days (b) 15 days (c) 20 days (d) 30 days

14. A can do a piece of work in 14 days which B can do in 21 days. They begin together but 3 days before the completion of the work, A leaves off. The total number of days to complete the work is :
(a) 6 3/5 (b) 8 ½ (c) 10 1/5 (d) 13 ½

15. If Ramesh, Suresh and Harish can do a piece of work in 15 days, 10 days and 6 days respectively, how long will they take to do it, if all the three work at it together?
(a) 3 days (b) 3 ½ days (c) 3 9/20 days (d) 3 3/20 days

16. A and B can do a piece of work 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 ? (a) 150 days (b) 120 days (c) 100 days (d) 80 days

17. A and B can do a piece of work in 5 days; B and C can do it in, 7 days; A and C can do it in 4 days. Who among these will take the least time if put to do it alone?
(a) A (b) B (c) C (d) Data inadequate

18. If A, B and C together can finish a piece of work in 4 days; A alone can do it in 12 days and B in 18 days, then C alone can do it in :
(a) 21 days (b) 16 days (c) 14 days {d) 9 days

19. A and B can do a piece of work in 18 days; B and C can do it in 24 days; A and C can do it in 36 days. In how many days can they do it all working together'?
    (a) 12 (b) 13 (c) 16 (d) 26

20. A and B together can do a piece of work in 12 days, which B and C together can do in 16 days. After A has been working at it for 5 days and B for 7 days, C finishes in 13 days. In how many days C alone will do the work
(a) 16 (b) 24 (c) 36 (d) 48

21. A is twice as good a workman as B and together they complete a work in 15 days. In how many days can the work be completed by B alone?)
(a) 22 ½ (b) 30 (c) 37 ½ (d) 45

22. 45 men can complete a work in 16 days. Six days after they started working, 30 more men joined them. How many days will they now take to complete the remaining work?
(a) 4 (b) 5 (c) 6 (d) 8

23. 12 men can complete a work in 18 days. Six days after they started working, 4 men joined them. How many days will all of them take to finish the remaining work?
(a) 9 (b) 10 (c) 12 (d) 15

24. Twelve men can complete a work in 8 days. Three days after they started the work, 3 more men joined. In how many days will all of them together complete the remaining work?
(a) 2 (b) 4 (c) 5 (d) 6

25. A, B and C are employed to do a piece of work for Rs. 529. A and C are supposed to finish 19/23 of the work together. How much shall be paid to B ?
(a) Rs. 82 (b) Rs. 92 (c) Rs. 300 (d) Rs. 437

26. A job is completed by 10 men in 20 days and by 20 women in 15 days. How many days will it take for 5 men and 10 women to finish that work?
(a) 17 ½ (b) 17 1/7 (c) 17 (d) 17 1/120

27. A piece of work can be done by 6 men and 5 women in 6 days or 3 men and 4 women in 10 days. It can be done by 9 men and 15 women in :
(a) 1 day (b) 2 days (c) 3 days (d) 4 days

28. 4 men and 6 women finish a job in 8 days, while 3 men and 7 women finish it in 10 days. In how many days will 10 women working together finish it ?
    (a) 24 (b) 32 (c) 36 (d) 40

29. 12 children take 16 days to complete a work which can be completed by 8 adults in 12 days. 16 adults started working and after 3 days 10 adults left and 4 children joined them. How many days will it take them to complete the remaining work?
(a) 6 (b) 8 (c) 4 (d) 3

30. Ram can do a piece of work in 8 days which Shyam can finish in 12 days. If they work at it on alternate days with Ram beginning, in how many days, the work will be finished?
(a) 9 1/3 (b) 9 ½ (c) 91/24 (d) 10 1/3

31. 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 the work will be completed?
(a) 10 ½ (b) 10 1/3 (c) 10 ¼ (d) 10 2/3
32. A, Band C can do a piece of work in 11 days, 20 days and 55 days respectively, working alone. How soon can the work be done if A is assisted by Band C on alternate days?
(a) 7 days (b) 8 days (c) 9 days (d) 10 days
33. Machines A and B produce 8000 clips in 4 and 6 hours respectively. If they work alternately for 1 hour, A starting first, then 8000 clips will be produced in :
(a) 4 1/3 hours (b) 4 2/3 (c) 5 1/3 hrs (d) 5 2/3 hrs
34. A father can do a job as fast as his two sons working together. If one son does the job in 3 hours and the other in 6 hours, how many hours does it take the father to do the job?
(a) 1 (b) 2 (c) 3 (d) 4
35. A sum of money is sufficient to pay A's wages for 21 days and B's wages for 28 days. The same money is sufficient to pay the wages of both for:
(a) 12 days (b) 14 days (c) 12 ¼ days (d) 24 ½ days
36. 2 men and 3 boys can do a piece of work in 10 days while 3 men and 2 boys can do the same work in 8 days. In how many days can 2 men and 1. boy do the work?
(a) 12 ½ days (b)14 (c)17 (d)8
37. A is twice as good a workman as B and together they finish a
piece of work in 18 days. In how many days will A alone finish the work?
    a. 37 b. 27 days c. 67 d. 44
38. A and B undertake to do a piece of work for Rs. 600. A alone
can- do it in 6 days while B alone can do it in 8 days. With the help of C, they finish it in 3 days. Find the share of A?
a. Rs. 400
b. Rs. 800
c. Rs. 300
d. none
39. A and B undertake to do a piece of work for Rs. 600. A alone
can do it in 6 days while B alone can do it in 8 days. With the help of C, they finish it in 3 days. Find the share of B?
a.Rs. 400
b.Rs. 800
c.Rs. 300
d.Rs.225
40. A and B undertake to do a piece of work for Rs. 600. A alone
can- do it in 6 days while B alone can do it in 8 days. With the help of C, they finish it in 3 days. Find the share of c?
(a) Rs. 75 b. 27 days c. 67 d. 44
41. A and B can do a piece of work in 12 days; Band C can do it
in 15 days ; A and C can do it in 20 days. In how many days will A, Band' C finish it, working all together?
(a) 10 days b. 27 days c. 67 d. 44
42. A and B can do a piece of work in 12 days; Band C can do it
in 15 days ; A and C can do it in 20 days. find the number of days taken by A to finish it working alone.
(a) 30 days b. 27 days c. 67 d. none
43. A and B can do a piece of work in 12 days; Band C can do it
in 15 days ; A and C can do it in 20 days. find the number of days taken by B to finish it working alone.
(a) 30 days b. 20 days c. 67 d. none

44. A and B can do a piece of work in 12 days; B and C can do it
in 15 days ; A and C can do it in 20 days. find the number of days taken by C to
finish it working alone.
(a) 60 days (B) 30 days C. 20 days D. NONE
45. A is twice as good a workman as B and together they finish a
piece of work in 18 days. In how many days will A alone finish the work?
(a) 27 days (B) 30 days C. 20 days D. NONE
46. A and B undertake to do a piece of work for Rs. 600. A alone
can- do it in 6 days while B alone can do it in 8 days. With the help of C, they finish
it in 3 days. Find the share of A?
(a) Rs. 300 (B) 30 days C. 20 days D. NONE
47. A and B undertake to do a piece of work for Rs. 600. A alone
can- do it in 6 days while B alone can do it in 8 days. With the help of C, they finish
it in 3 days. Find the share of B?
(a) Rs.225 (B) 30 days C. 20 days D. NONE
48. A can do a piece of work in 10 days which B alone can do in 12
days. In how many days will they finish the work, both working together?
(a) 5 5/11 days b. 27 days c. 67 d. 44
49. Two persons A and B working together can dig a trench in 8 hours while A alone
can dig it in 12 hours. In how many hours B alone can dig such a trench?
(a) 25 hours (b) 24 hours (c) 42 hours (d) none
50. Ex. 4. 3 men can complete a piece of work in 6 days. Two days after
they started the work, 3 more men joined them. How many days will they take to
complete the remaining work?
    (a) 25 hours (b) 24 hours (C) 2 days d) n0ne

ANSWERS:
FOR PAPER – II:-
1. (a) 2.(c) 3.(a) 4.(b) 5.(c)
6.(c) 7.(d) 8.(c) 9.(a)10. (c)
11.(d) 12.(b) 13.(b) 14.(c) 15.(a)
16.(b) 17.(a) 18.(d) 19(c)20. (b)
21.(d) 22(c) 23.(a) 24.(b) 25.(b)
26.(b) 27.(c) 28(d) 29(a)30.(b)
31.(c) 32.(b) 33.(b) 34.(b) 35.(a)
36.A 37.B 38.C 39.D 40.A
41.A 42.A 43.B 44.A 45. A
46.A 47.A 48.A 49.B 50.C