**7. TIME & WORK**

**Solution Exercise – Easy**

1. (d) : Sachin will complete the whole work in 17 days since he does  part each day.

2. (b) : Sudhir will do  part in 1 day.

3. (a) : Total work = LCM (36, 24) = 72

A’s 1 day work = 

B’s 1 day work = 

Both together will do the work in = 

4. (b) : Men required are = 

5. (b) : To complete work in 12 days = men are required.

6. (a) : Three works of same type will be completed by Aarti in 18 days.

7. (a) : Total work = LCM (6, 12, 24) = 24

*M*’s 1 day work = 

*N*’s 1 day work = 

*P*’s 1 day work = 

Total = 7

Together they do it in = 

8. (c) : Total work = LCM (4, 5, 6) = 60

*P*’s 1 day work = 

*Q*’s 1 day work = 

*R*’s 1 day work = 

Total = 37

So, together they will take = 

9. (c) : Men needed = 

10. (c) :

|  |  |  |
| --- | --- | --- |
| Days | Work |  |
| Monu = 6 |  | 1 day work = 4 |
| Pinku = 12 | 24 | 1 day work = 2 |
| Rita = 24 |  | 1 day work = 1 |

Together they do it in 

11. (b) : 15 person can do it in = 

12. (b) :

|  |  |  |
| --- | --- | --- |
| Days | Total  Work |  |
| Mohan = 30 | 60 | Mohan’s 1 day work = 2 |
| Sohan = 20 | Sohan’s 1 day work = 3 |

Together they do it in = 

13. (c) : Total work = LCM (6, 12, 15) = 60

*P*’s 1 day work = 

*Q*’s 1 day work = 

*R*’s 1 day work = 

Total = 19

Together they do it in = 

14. (d) : 

15. (c) :

|  |  |  |
| --- | --- | --- |
| Length | Men | Days |
| 12 | 18 | 20 |
| *x* | 12 | 15 |

Length of road = 

16. (a) : Total work = LCM (10, 7) = 70

Mohan’s 1 day work = 

Ramesh’s 1 day work = 

Both do the work in = 

17. (c) : Boys required are = 

18. (c) : To eat 30 pastries in 30 minutes

=  men are required.

= 

*M* = 3

19. (a) : Days required are = 

= 

20. (a) : Let total work be 24 (LCM of 8 and 6).

*B*’s 1 day work = 3

⇒ 

*A*’s 1 day work = 1

*A* will do the work alone in 

21. (d) : Total work = LCM (15, 20) = 60

(*A* & *B*)’s 1 day work = 

*B*’s 1 day work = 

*A*’s 1 day work = 4 − 3 = 1

So, *A* alone would do it in 

22. (c) : *A*’s 1 day work = 2

*B*’s 1 day work = 1

Total 1 day work is = 3

In 6 days, they work 6 × 3 = 18

*B* alone do it in = 

23. (c) : Total work = LCM (28, 21) = 84

(*A* & *B*)’s 1 day work = 

(*A*, *B* & *C*)’s 1 day work = 

⇒ *C* = 1

So, *C* alone will take 

24. (d) : Let *A*’s 1 day work = 3

*B*’s 1 day work = 2

In 15 days, both do 15 × 5 = 75

*A* alone would do it in = 

25. (d) : Total work = LCM (5, 4, 2) = 20

*P*’s 1 day work = 

*Q*’s 1 day work = 

(*P + Q + R*)’s1 day work = 

So, *R*’s 1 day work = 10 − 4 − 5 = 1

*R* would do it in 

26. (a) : Anu’s 1 day work = 3

Divya’s 1 day work = 1

Both make 4 units in 1 day.

So, in 15 days work done is 60 units.

Divya alone completes the work in = 

27. (b) : Efficiency A : B

A’s 1 day work = 3

B’s 1 day work = 2

Both together do work in 18 days.

18 = 

Work = 90 units

A will do the work alone in 

28. (c) : Total work = LCM (30, 40, 60) = 120

*a + b* = 

*b + c* = 

*c + a* = 

⇒ 2(*a + b + c*) = 9

*a + b + c* = 

They will do the work in = 

= 

29. (b) : *A* can do  work in 5 days

Complete = 10 days

*B* can do 

Complete = 

|  |  |  |  |
| --- | --- | --- | --- |
| Days | Work |  | |
| *A* = 10 | 50 | *A*’s 1 day work | = 5 |
| *B* = 25 | *B*’s 1 day work | = 2 |
|  |  | Total | 7 |

Both will do in = 

30. (a) : Total work = LCM (18, 12) = 36

Ashish’s 1 day work = 

3 day work = 3 × 3 = 9

Ravi’s 1 day work = 

Remaining work = 36 − 9 = 27

Ravi will complete this work in = 

31. (a) : Total work = LCM (12, 20, 15) = 60

*a + b* = 

*b + c* = 

*c + a* = 

⇒ 2(*a + b + c*) = 12

*a + b + c* = 6

So, *a* = 3

*b* = 2

*c* = 1

So, *A* will do the work in = 

*B* will do the work in = 

*C* will do the work in = 

32. (a) : Total work = LCM (14, 8) = 56

(*A* & *B*)’s 1 day work = 

(*A*, *B* & *C*)’s 1 day work = 

*C*’s 1 day work = (7 − 4) = 3

So, *C* will do the work in  *i.e*. 

33. (b) : Total work = LCM (10, 12, 15) = 60

*A*’s 1 day work = 

*B*’s 1 day work = 

*C*’s 1 day work = 

Total = 15

In 2 days work completed = 30

*A* & *C* finish do the remaining in = 

34. (b) : Trucks washed by Pramod in 1 day = 

In four days, he wash 36 trucks.

35. (c) : *B* can copy =  = 3 pages in 1 hr.

*A + B* =  = 5 pages in 1 hr.

∴ *A* can copy = 5 − 3 = 2 pages in 1 hr.

∴ *A* can copy 42 pages in 

36. (a) : As Vishu do the work in half number of days it means Vishu is more efficient, he will be paid more.

If total work is 20.

Ishu’s 1 day work = 

Vishu’s 1 day work = 

So, amount will be paid in ratio of work done which is 1 : 2.

Vishu’s share = 

37. (a) : 6 men = 10 women

1 man =  woman

12 men and 10 women = 

= 20 + 10 = 30 women

30 women will do the work in = 

38. (c) : If *B* do 2 units of work in 1 day

∴ *A* do 1 unit in  day.

So, in 1 day *A* will do  units of work.

*A*’s 1 day work = 

*B*’s 1 day work = 2

Total 1 day work = 

⇒ In 18 days work done = 

So, *B* alone would do it in 

39. (d) : Let the total work be 72 (LCM of 18 & 8).

Harish’s 1 day work = 

In 12 days = 4 × 12 = 48

Remaining work = 72 − 48 = 24

Deepak’s 1 day work = 

Deepak alone can complete the work in = 

40. (d) : Total work = LCM (6, 4) = 12

*B*’s 1 hour work = 

*B*’s & *C*’s 1 hour work = 

⇒ *C*’s 1 hour work = 3 − 2 = 1

(*A + B + C*) 1 hour work = 

*A + B* (1 hour) = 

*A & B* will do the work in = 

= 

41. (a) : 10 women = 6 men

1 women =  men

12 women + 10 men = 

= 

If 6 men reap in 86 days

then,



42. (a) : Total work = LCM (10, 12) = 60

One pipe fills = 

Other pipe empty = 

⇒ 1 litre tank filled in 1 hour.

Tank will be filled in 

43. (a) : Total capacity = LCM (30, 15) = 30

Tap *A* can fill = 

Tap *B* can fill = 

Total = 3 litres

Both will fill the tank in .

44. (b) : Total capacity = LCM (8, 16) = 16

In 1 hour Tap 1 can fill = 

In 1 hour Tap 2 can empty = 

1 litre is filled in the tank in 1 hour.

To fill the tank 16 hours are required.

45. (b) : Total capacity = LCM (10, 12) = 60 *l*

Tank filled by tap in 1 hour = 

Leakage emptying the tank in 1 hour = 

So, in 1 hour tank is filled by 2 litre.

To fill the tank to half of its capacity time required

= 

46. (d) : Total capacity = LCM (25, 40, 30) = 600

Tap *A* can fill in 1 minute = 

Tap *B* can fill in 1 minute = 

Tap *C* can empty in 1 minute = 

Total = 24 + 15 − 20 = 19 litres

In 1 min. 19 litres are filled.

Tank will be filled in = 

47. (b) : Capacity = LCM (6, 8) = 24 *l*

Pipe *A* filling in 1 hour = 

Pipe *B* emptying it in 1 hour = 

So, in 1 hour tank is filled by 1 litre.

it will take 24 hours to fill an empty tank.

48. (c) : Total capacity = LCM (10, 6) = 30

In 1 min. *A* can fill = 

In 1 min. *B* can empty = 

In 1 min. = − 2 litres

⇒ Tank gets empty by 2 litres in 1 minute.

 is *i.e*. 12 litres

So, to empty it ⇒  = 6 minutes are required.

49. (a) : To clean 10 floors, we need to have 10 × 10 = 100 man-days.

So, to clean 8 floors, we need to have 80 man-days.

So, 80 = *D* × 8.

So, *D* = 10 days.

**Alternate Method:**

Using 



⇒ *D*2 = 10 days.

50. (d) : Here *W*1 = 20 *W*2 = 24

*M*1 = 24 *M*2 = 16

*D*1 = 32 *D*2 = ?

Putting the values in the equation 

We get  ⇒ *D*2 = 57.6 days.

**Solution Exercise – Medium**

1. (b) : Total work = LCM (3, 4, 6) = 12 units

*A* does  = 4 units work.

*B* does  = 3 units work.

*C* does  = 2 units work.

∴ They together take  days

=  days.

2. (b) : Total work = LCM (26, 39) = 78 units

*A*’s one day’s work = 

*B*’s one day’s work = 

In 2 days working alternatively they can do 2 + 3 = 5 units

So, in 30 days they will over 75 units.

Now on 31st day *A* will work and do 3 units to complete the work.

3. (d) : Let us assume 20 Men as one person ‘A’.

Similarly, 30 Women as another person ‘B’.

Total work = LCM (24, 30) = 120

A’s one day work = 4

B’s one day work = 5

Together =  days

4. (a) : Share of wages = 

*B*’s share× Rs. 2100 = Rs. 900

5. (c) : Total work = LCM (10, 12, 15) = 60

Per day work of *A*, *B* and *C* is 

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Day | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Total |
| No. of days | 6 | 6 | 15 | 6 | 6 | 15 | 6 | 60 |

So, the number of days = 7

6. (b) : 2800 × 60 = 840 × *d*

⇒ *d* = 200 days

7. (d) : 1 *M* = 2 *F* = 4 *C*

Total work = 24 × 24 = 576 units

Now, 48 *W* + 120 *C*

⇒ 

⇒ 24 + 30 = 54 *M*

Days required = 

8. (c) : Let Total work = LCM (8, 12) = 24 units.

Work done by leak per hour =  = 3 units.

Work done by leak with tap per hour =  = 2 units.

∴ Work done by tap per hour = 1 unit/hour

Now, this 1 unit/hour = 6 litres/hour (given)

∴ Capacity of tank = 6 × 24 litres = 144 litres.

9. (b) : Total capacity = LCM (12, 16) = 48 units

*X* = 

*Y* = 

Total time taken = 

4 minutes before, amount of water filled = 

= 

Left over units = 48 − 20 = 28 units.

Pipe *Y* will take = 

Total time = 

10. (a) : Total work = LCM (30, 40, 60) = 120 units

*A + B* = 4 units/day

*B + C* = 3 units/day

*C + A* = 2 units/day

Adding all, we get

2 (*A + B + C*) = 9 units/day

Days = 

11. (a) : Share of *A* : Share of *B* = 

*A*’s share =  × 149.25 = 89.55

*B*’s share =  × 149.25 = 59.70

12. (d) : Let total work = LCM (32, 12, 5) = 480 units

*X* and *Y* together = 

*Y* alone = 

*X* units/day = 40 − 15 = 25 units.

In 5 days *Y* can do = 5 × 15 = 75 units/day

Remaining work = 480 − 75 = 405 units/day

Day’s takes by *A* = 

13. (b) : Total capacity = LCM (8, 6, 12) = 24 units

Pipes can do 3, 2 and − 4 units of work per hour.

Pipe opened at 1 p.m. = 6 units (till 3 p.m.)

Pipe opened at 2 p.m. = 2 units (till 3 p.m.)

Work left = 24 − (6 + 2) = 16 units

Time taken further (after 3 p.m.) = 

So, it will be full at 7 a.m.

14. (c) : Total capacity = LCM (20, 30, 15) = 60 units

*A* = 3 units/min. ; *B* = 2 units/min. ; *C* = − 4 units/min.

when opened alternatively they will do 3 + 2 − 4 = 1 unit work in 3 minutes.

So, 55 unit work will be done in 165 minutes.

In 166th, *A* will do 3 units and in 167th, *B* will do 2 units to completely fill the tank.

15. (b) : Let total job = LCM (10, 12, 15) = 60 units

Per day work of *A*, *B* & *C* is  respectively.

So, 3 days they will complete 6 + 5 + 4 = 15 units of work.

So, the work gets completed in =  = 4

*i.e*. 4 × 3 = 12 days

16. (d) : Total work = LCM (20, 30, 36) = 180 units

Taps can do  units of work in 1 minute.

With waste pipe open they can do 6 units  of work in 1 minute.

One minute work of waste pipe = (9 + 5) − 6 = 8 units

Time taken by waste pipe to empty = 

17. (b) : Total work = LCM (3, 6, 4) = 12 units

Together *P* and *Q* = 

In 3 days work done = 3 × 2 = 6 units

*P*’s one day work = 

*Q*’s one day work = 2 − 1.5 = 0.5 unit/day

Time taken by *Q* alone = 

18. (a) : 

⇒ 1200 = *l* + 8 *l* + 6 *l*

⇒ 15 *l* = 1200

⇒ *l* = 80 litres

19. (a) : Capacity of tank = LCM (28, 32) = 224 units

Time without leak = 

Actual time taken = 

So, 

15 − *x* = 14

*x* = 1 unit/hour

So, leak takes out 1 unit/hour and hence it will empty tank in 224 hours.

20. (b) : Tap *A* fills 20 litres water in 24 minutes.

Tap *B* fills 40 litres water in 60 minutes.

and Tap *C* fills 10 litres water in 20 minutes.

Hence, work done by all the taps together in 2 hours

=  = 240 litres and this is the capacity of the tank.

21. (b) : *A* = 8 glasses in 48 minutes

*B* = 16 glasses in 2 hours

*C* = 4 glasses in 40 minutes

In 4 hours,

*A* = 

*B* = 

*C* = 

Total water = 40 + 32 + 24 = 96 glasses.

Capacity = 96 × .5*l* = 48 litres

22. (b) : Total capacity = LCM (12, 15, 20) = 60 units

*A* =  = 5 units/hour

*B* =  = 4 units/hour

*C* =  = 3 units/hour

*A* + *B* = (5 + 4) = 9 units

*A* + *C* = (5 + 3) = 8 units

In 2 hours → 17 units work is done and

in 6 hours → 51 units.

In next hour *A* & *B* will work 9 units to complete 60 units.

∴ The tank will be filled in 7 hours.

23. (a) : Let the capacity of tank *L*.

So, 

⇒ 

⇒ 

⇒ *L* = 34560 litres = 34.56 *KL*.

24. (b) : Large pump = 3*x* *l*/min.

Small pump = 2*x l*/min.

Large pump alone = 

all pumps together = 

∴ They take rd of time.

25. (a) : Time =  = 777.6 hours

[Note: 1 cubic feet = 12 inch = 122 = 1728]

26. (a) : Let tank capacity in LCM (8, 10) = 24

Per hour work of inlet & outlet pipe is 

Let the number of inlet & outlet pipes be *a* & *b* respectively.

So, *a* + *b* = 12

3*a* − 2*b* = 1

*b* = 7

⇒ *a* = 5

27. (d) : Let capacity = LCM (40, 50) = 200 units

Tap 1 = 

Tap 2 = 

Total = 5 + 4 = 9 units/min.

In 10 minutes = 9 × 10 = 90 units

Remaining = 200 − 90 = 110 units

More time required = 

28. (d) : Total work = LCM (15, 18) = 90 units

Per minute work is 11 units ; As they are closed 3 minutes before filling so 33 units work is left, which has to be done by first pipe.

Time =  = 5 min. 30 sec.

29. (b) : Let capacity of tank = LCM (20, 30, 36) = 180 units

Pipe 1 = 

Pipe 2 = 

All together = 

Waste pipe = (9 + 6) − 5 = 10 units/hour

Waste pipe alone = 

30. (b) : Total capacity = LCM (24, 32) = 96 units

*P* =  = 4 units/min.

*Q* =  = 3 units/min.

So, 4(16 − x) + (3 × 16) = 96

⇒ 64 + 48 − 96 = 4*x*

⇒ *x* = 4 minutes

It should be turned off after 12 minutes.

31. (c) : Let capacity = LCM (48, 64, 36) = 576 units

Pipe *A* = 

Pipe *B* = 

So, (36 ×12) + (*x* × 9) = 576

*x* = 16 minutes

So, pipe *B* should be closed after 16 minutes.

32. (a) : 



*t* = 48 minutes (lets say its minutes)

So, *B* = 48 min.

*A* = 16 min.

Total work = LCM (48, 16) = 48 units.

Time required =  = 12 minutes

33. (d) : 

5 × *M* × 65 × 20 = 4 × 165 × 585 × 15

*M* = 

More men required = 891 − 585 = 306 men.

34. (d) : Total work = 32 × 12 = 384 units

So, 1 man can do 1 unit/day

1 woman can do  unit/day

1 child can do  unit/day

So, 64 women & 128 children will do

64 ×  + 128 ×  = 32 + 32 = 64 units

So, total work they will finish in  *i.e*. 6 days.

35. (a) : Let total work = LCM (60, 32, 22) = 5280 units

Work done by (*X* & *Y*) together in 32 days

= 

Remaining work = 2464 units

*Y* will do this in 22 days so one day work

=  = 112 units

Days required by *Y* to complete the work alone

=  = 47.14 days.

36. (c) : 16 *w* = 12 *m* = 24 *b*

⇒ 4 *w* = 3 *m* = 6 *b*

Total work by men = 12 × 18 × 12 *m* = 2592 *m* units.

So, (24 *m* × 12) + (24 *w* × 12) + (24 *b* × 12)

= 288 *m* + 216 *m* + 144 *m* = 648 *m*

Days required = 

37. (c) : Let the total capacity = *l*

So, 

⇒ 

⇒ 

⇒ 

⇒ 332.3 litres.

38. (b) : Let capacity of tank = 1200 units

Pipes together = 

Let time take alone *x* and (*x* − 10)



⇒ 

⇒ 2400*x* − 12000 = 100*x*2 − 1000*x*

⇒ *x*2 − 10*x* − 24*x* + 120 = 0

⇒ *x*2 − 34*x* + 120 = 0

⇒ *x* = 

⇒ *x* = 

⇒ *x* = 4 and 30

So, *x* = 30

∴ Time taken by faster pipe is 30 − 10 = 20 hours.

39. (a) : Let total work = 48 units

*Q* = 

*Q + R* = 

*P + Q + R* = 

So, *R* = 2 units/day and P = 3 units/day

*P* and *Q* will take = 

40. (b) : Total work = *W*

Men required after 30 days = *M*



⇒ 

⇒ *M* = 216

More men required = 216 − 72 = 144

41. (d) : Let us assume that building one wall = 40 units work.

So, Anil does = 4 units/day, and Umesh does = 8 units/day

Since, efficiency is falling by 10%, so it is a case of geometric progression.



where, common ratio = 

Now, sum of an infinite G.P. = 

= 

Thus, it is clear that Anil will take infinite time, so he will never finish the work.

42. (c) : Umesh does = 8 units/day

Since, efficiency is falling by 10%, so we have



where, common ratio = 

Solving we get the number of days to complete the wall

= 7 days approx. (Using *Sn* = )

43. (a) : Total work = 80

Now, per day work of Anil and Umesh will be as follows.



Here, common ratio = 

Using *Sn* =, we get *n* = 12 (approx.)

44. (d) : = 

⇒ 40 *M* − 400 = 24 *M*

⇒ *M* = 25

45. (a) : 

⇒ 3 × *M* × 93 = 186 × 7 × 93

⇒ *M* = 434

More number of men = 434 − 186 = 248

46. (c) : 1 *W* = 

So, 16 *M* + 12 *W* = 16 *M* + 4 *M* = 20 *M*

Total work = 20 × 8 = 160 units

Now, 6 *M* + 6 *W*

= 6 *M* + 2 *M*

= 8 *M*

∴ Time taken = days.

= 20 days

47. (c) : 16*x* = *x* + (*x* − 8) + (*x* − 16) + ...... + (*x* − 184)

⇒ 16*x* = 24*x* − 8 (1 + 2 + 3 + ....... + 23)

⇒ 8*x* = 

⇒ *x* = 276 men

48. (b) : Total work = LCM (8, 16, 24) = 48 units

Let us say work lasted for *x* days.

So, 6*x* + 3(*x* − 1) + 2 × 3 = 48

⇒ 9*x* − 3 = 42

⇒ 9*x* = 45

⇒ 

49. (a) : Let each do *x*, *y* and *z* units of work per month respectively.

then *x + y + z* =  ..... (1)

also *x + z* = 2*y* ..... (2)

and *x + y* = 3*z* ..... (3)

Using (1) and (2),

3*y* = 

*y* = 

⇒ *y* alone  of the total work in 1 month.

∴ *y* takes 36 months alone to do it separately.

Using (1) and (3),

4z = 

z = 

∴ *z* takes 48 months alone.

*x* =  −  − 

= 

∴ *x* takes  days alone.

*i.e*. 

50. (d) : *Z* can do = 3 units/day

*Y* can do = 2 units/day

*X* can do = 1 unit/day

Total work = (3 + 2 + 1) × 8 = 48 units

So, they take  days respectively.

51. (b) : 4950 × 1275 × 36 = *R* × 1100 × 25

*R* = 8262

Reinforcement = 8262 − 4950 = 3312.

52. (b) : Ratio of share *A : B : C* = 

53. (d) : Let number of people = *x*

Each can eat = 1 unit/day

Food supply is available food days

Total food = *x* × *d = xd*.

So, *xd* = 

⇒ 

⇒ 

⇒ *d* = 60 days

54. (a) : Let *A + B* takes = *x* days

*A* alone = *x* + 16 days

*B* alone = *x* + 9 days

⇒ 

⇒ (*x* + 9 + *x* + 16)*x* = (*x* + 9) (*x* + 16)

⇒ *x*(2*x* + 25) = (*x* + 9) (*x* + 16)

Solving we get,

2*x*2 + 25*x* = *x*2 + 25*x* + 144

⇒ *x*2 = 144

⇒ *x* = 12 days

55. (c) : *P* = *x* days

*M* = 2*x* days

*R* = days

All working together = 

⇒ 

⇒ 

∴ *M* can do the work in 18 × 2 = 36 days.

56. (d) : Let total work = *W*

Men required after 35 days = *M*



⇒ 

⇒ 

⇒ *M* = 126 men

∴ Men allowed to go off = 180 − 126 = 54

57. (d) : Priya = 1350 hours

Rachna = 

Total work = LCM (1350, 900) = 2700 units

So, Priya = 2 units/hour

Rachna = 3 units/hour

Time taken = 

= 

58. (a) : Bhawna = 21 days

Ratna = 

Manya = 

Total work = LCM (21, 15, 10) = 210 units

Working together

= 

= 

59. (d) : *Y* = *x* units/day

*X* = 2*x* units/day

Total = 3*x* units/day

Total work = 64 × 3*x* = 192*x* units

*X* will take = 

*Y* will take = 

60. (a) : Let total work = 96 units

Anil + Ballu = 

Ballu + Chaman = 

Anil + Ballu + Chaman = 12 units/day

So,

Anil = 6 units/day

Ballu = 4 units/day

Chaman = 2 units/day

Anil + Chaman = 

Ballu alone = 

61. (c) : Let us assume total work = 600 units

1 day work of a man = 

1 day work of a woman = 

15 men + 6 women = (15 × 6) + (6 × 5) = 120 units/day

Number of days required = 

62. (d) : 15 × *x* = 21 × (*x* − 6)

⇒ 6*x* = 6 × 21

⇒ *x* = 21

63. (c) : 2 *M* = 4 W = 6 *B*

1 *M* = 2 *W* = 3 *B*

Each of them take 396 days.

Now, 1 *M* + 1 *B* + 1 *W*

Converting all of them ot Boys

3 *B* + 1 *B* + *B*

⇒ 

So, they will take = 

= 72 days.

64. (b) : Let total work = 960 (LCM (192, 160, 240))

6*w* + 8*b* = 5  ..... (1)

*m* + 16*b* = 6  ..... (2)

4*m* + 6*w* = 4  ..... (3)

Using (1) and (3),

8*b* − 4*m* = 1

16*b* + 4*m* = 6

24*b* = 7

*b* = 

Now, 6*w* + 

6*w* = 

*w* = 

*w* = 

Also, 4*m* + 

4*m* = 

4*m* = 

*m* = 

Now, number of hours taken by 10 men and 24 boys will be

= 

=  =  = 

65. (c) : Total work = 15 × 210

15 × 210 = (15 × 10) + (15 + 30) × d)

( New 15 men have double the efficiency)



= 

∴ Total days taken will be 

66. (a) : Total work = LCM (60, 22, 76) = 12540 units

*A* and *B* together = 

So, (209 × 22) + (76 × *A*) = 12540

*A* = 104.5 units/day

⇒ *B* = 209 − 104.5

= 104.5 units/day

Time taken alone by each = 

67. (c) : Let total work be = 12 × 15 = 180 units.

Work done from 10 a.m. till 4 p.m. = 12 × 6 = 72 units.

Remaining work = 180 − 72 = 108 units.

Now, they will work (per hour)

13, 14, 15 units and so on.

∴ 13 + 14 + 15 + 16 + 17 + 18 = 93

Another 93 units are done in 6 hours. Remaining are 15 units which will be done  hours.

So, total time = 6 + 6 + hours = 12 hours 47 minutes

68. (c) :

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | A | B | C | D |
|  | − 20 | + 20 |  |  |
|  | + 90 |  | − 90 |  |
|  | − 10 |  |  | + 10 |
|  |  |  | − 50 | + 50 |
|  |  | − 100 | + 100 |  |
|  |  | + 110 |  | − 110 |
| Total | + 60 | + 30 | − 40 | − 50 |

*D* gets emptied first, it gets emptied in 20 minutes.

69. (b) : Total capacity = LCM (9, 6) = 18 units

Inlet pipe =  = 2 units

Outlet pipe =  = 3 units

Total work =  = 2 units

So, 2*x* − 3 (6 − *x*) = 2

⇒ 5*x* = 20

⇒ *x* = 4

70. (b) : 

*x* = 72 men.

71. (a) : Work done by *A*, *B* and *C* in 1 day together = 50%

Work done by *A* in one day = 

Work done by *B* in one day = 25%

Work done *C* in one day = (50% − 10% − 25%) = 15%

72. (c) : Let work lasted for *x* days.

Then, *A*’s 3 days work + *B*’s (*x* − 4) days + *C*’s *x* days work

LCM (12, 20, 24) = 120

*A*’s one day work = 10

*B*’s one day work = 6

*C*’s one day work = 5

10 × 3 + 6 (*x* − 4) + 5*x* = 120

6*x* − 24 + 5*x* = 90

11*x* = 114

*x* = 

73. (a) : Let the work be finished in *x* days.

Then *A*’s *x* days work + *B*’s (*x* − 2) days work + *C*’s (*x* − 1) days work

LCM (40, 8, 16 = 80)

*A*’s one day work = 2

*B*’s one day work = 10

*C*’s one day work = 5

2*x* + 10(*x* − 2) + 5(*x* − 1) = 80

7*x* = 105

*x* = 

74. (c) : LCM (25, 80, 60) = 1200 unit work.

*A* = 

*B* = 

*C* = 

First 3 day work = (48 + 20 − 15) = 53

Now, on 66th day = 53 × 22 = 1166 unit be completed.

Work left = 1200 − 1166 = 34 unit

On 67th day the work will be completed by *A* = 

= 

75. (d) : LCM (15, 30, 45) = 90

*A*’s work = 

*B*’s work = 

*C*’s work = 

(*A + B + C*) = (6 + 3 − 2) = 7 unit/day.

Total time = 

**Solution Exercise – Difficult**

1. (b) : Work done by a woman in 1 hour = *w*

Work done by a man in 1 hour = *m*

Work done by a boy in 1 hour = *b*

8 *w* = 6 *m* = 12b

⇒ 4 *w* = 3 *m* = 6b ..... (1)

Now,

Total work by 9 men in 6 days working 6 hours per day

= 9 × 6 × 6 × *m*

= 324 *m*

Day taken by 12 men, 12 women & 12 boys working 8

hours a day = 

Using (1),

= 

= 

2. (b) : Total work = LCM (12, 24, 16, 36, 30, 8, 24, 40)

= 720 units

One day work of a man = 

One day work of a woman = 

One day work of a child = 

Total work = (8 × 2.5) + (1.25 × 24) + (40 × 1) in 1 day by 8 men, 24 women and 40 children

= 20 + 30 + 40

= 90 units

Work in 4 days = 90 × 4 = 360 units

Remaining work = 720 − 360 = 360 units.

work to be done each day = 

Number of men required = 

Additional men = 72 − 12 = 60

3. (c) : Let the first typist takes *x* hours and second typist takes *y* hours to do the whole job alone. Now, given 3 hours work of first and 2 hours work of second = 

⇒  ..... (1)

Also,  ..... (2)

From equations (1) and (2),

*x* = 10 hours and *y* = 8 hours.

4. (a) : The total work will depend on the square of the radius *i.e*. 12, 22, 32.

Let total work = 32 × 90 = 810 units

∴ Time taken by 1st pipe = 

2nd pipe = 

Now, work done per unit of time will be same as that of radius square.

*i.e*. 1, 4, 9 units respectively.

∴ time taken by all working together

= 

5. (d) : Total Work = LCM (4, 8, 16, 32) = 32 units

Work done in one day by *A, B, C* and *D* are 8, 4, 2 and 1

respectively.

Using answer choices, we note that the pair of *B* and *C* does 6 units of work in one day; the pair of *A* and *D* does 9 units of the work in one day.

Hence, *A* and *D* take days.

*B* and *C* take  days.

Hence, the first pair must comprise of *A* and *D*.

6. (b) : 15 *m* = 24 *w* = 36 *b* ..... (1)

Assuming a man can work 1 unit in 1 hour.

Total work = 15 × 12 × 8 = 1440 units

New work = 

Now,

*x* men + 12 women + 6 boys

Using (1) we get,

x men +  men +  men

⇒  men are working on 3240 units.

Number of men = 

⇒ 

⇒ 6*x* = 180 − 60

⇒ *x* = 8 men

7. (c) : Total work = LCM (20, 40, 50) = 200 units

A = 

B = 

C = 

Pair **wise**

A & B = 15 units/day

B & C = 9 units/day

A & C = 14 units/day

We have to use A & B and A & C alternatively starting with A & B.

29 units = 2 days.

and 174 units = 12 days.

On 13th day A & B will work and do 15 units. Next day 11 units will be done by A & C in .

Total days = 

8. (a) : Let there were originally *x* men.

Then, work done by *x* men on first day =,

work done by (*x* − 10) men in second day = .

Work done by (*x* − 20) men in third day =  and so on.

Hence,  + ....... 12 terms = 1

⇒ *x* = 165 men

9. (a) : Let filling capacity = *x* m3/min.

Emptying capacity = *x* + 10 m3/min.

So, 

Solving for *x*, we get

*x* = 50 m3/min.

10. (c) : D = 

D = 128

11. (c) : Machine **I:**

Number of nuts produced in one minute = 100

To produce 1000 nuts time required = 10 min.

Cleaning time for nuts = 5 min.

Over all time to produce 1000 nuts = 15 min.

Over all time to produce 9000 = 135 min – 5 min.

= 130 min ..... (1)

Machine **II:**

To produce 75 bolts time required = 1 min.

To produce 1500 bolts time required = 20 min.

Cleaning time for bolts = 10 min.

Effective time to produce 1500 bolts = 30 min.

Effective time to produce 9000 bolts = 30 × 6 – 10

= 170 min ..... (2)

From (1) and (2),

Minimum time = 170 minutes

12. (c) : Let the initial number of workers = *x*

Assuming a worker can do 1 unit in 1 day.

Total work = 12*x*

1st day = *x* workers

2nd day = *x* − 3 workers

3rd day = *x* − 3 + 2 workers

4th day = *x* − 1 − 3 = *x* − 4 workers

5th day = *x* − 4 + 2 = *x* − 2 workers and so on.

Time taken = 20 days

So, we can say

*x* + (*x* − 3) + (*x* − 1) + (*x* − 4) + (*x* − 2) + (*x* − 5) + (*x* − 3) + (*x* − 6) + (*x* − 4) + (*x* − 7) + (*x* − 5) + (*x* − 8) + (*x* − 6) + (*x* − 9) + (*x* − 7) + (*x* − 10) + (*x* − 8) + (*x* − 11) + (*x* − 9) + (*x* − 12) = 12*x*

⇒ 20*x* − 120 = 12*x*

⇒ 8*x* = 120

⇒ *x* = 15

13. (d) : It is clear that since there are 39 people in the ratio 6 : 5 : 2, there are 18 men, 15 women and 6 children. Ratio of the work done by a man : woman = 2 : 1. The ratio of the work done by a woman : child = 3 : 1. Hence the ratio of work done in a day by a man : a woman : a child = 6 : 3 : 1. So, the ratio of the work done in a day by 18 men, 15 wo men and 6 children would be (18 × 6) : (15 × 3) : (6 × 1) = 108:45:6. Hence the daily wage of Rs.1113 should be divided in this ratio. That makes it, Rs.756 for men, 315 for women and Rs.42 for children. Hence 6 children earn Rs.42 in a day. So the daily wage of a child should be equal to  = Rs.7

14. (d) : Work with options. If the cylinder has a capacity of 1200 litres, then the conical vessel shall have a capacity of 700 litres. Once 200 litres have been taken out from the same, the remaining volume in each of them shall be 1000 and 500.

**Alternative Method:**

Let the volume of conical tank be *x*.

Then the volume of cylindrical tank = *x* + 500

*x* + 300 = 2(*x* – 200) ⇒ *x* = 700

Volume of cylindrical tank = 700 + 500 = 1200 litres.

15. (d) : Total capacity = LCM (20, 30) = 60 units

Cold water = 

Hot water = 

Usual time = 

After closing waste pipe it took 3 more minutes.

*i.e*. 3 × 5 = 15 units more were filled .

So, actually in 12 minutes only 45 units were filled. It means in 12 minutes waste pipe took out 15 units.

So, to take out 60 units it will take 12 × 4 = 48 min.

16. (b) : Total capacity = LCM (15, 25) = 75 units

Tap A = 

Tap B = 

th of Tap A = 3 units/hour

rd of Tap B = 2 units/hour

When on normal running

Total work = 5 + 3 = 8 units

work in 6 minutes = 48 units

Work on partial flow = 75 − 48 = 27 units

time taken =  = 5.4 minutes

= 5 min. 24 sec.

17. (c) : As there is no day in the week whose first letter is R, it can be concluded that Raja does not have any holidays. Since 1996 is a leap year, we can figure out that Raja has totally worked for 7 days. Let his rate of doing the job be one unit per day. So he would complete 7 units work in a week. J’s situation is similar to Raja and does not have any holiday during the week. T will have two holidays in a week (Tuesday and Thursday). Since the rate of working for all the three of them is the same, the working pattern of J and T would be as follows.

We can see that depending on which day is February 25, 1996, to complete 7 units, they would either take 4 days or 5 days.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Sun. | Mon. | Tue. | Wed. | Thurs. | Fri. | Sat. |
| 2 units | 2 units | 1 unit | 2 units | 1 unit | 2 units | 2 units |

18. (c) : Now Raja has worked for (5 days in February + 31 days in March + 2 days in April) = 38 days. Let us assume his rate to be the same as in the previous question, viz. one unit a day. Hence, he completes 38 units totally. In a week, T takes holiday on Tuesday and Thursday, while Stakes holiday on Saturday and Sunday. We can see that their working pattern would be as follows.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Sun. | Mon. | Tue. | Wed. | Thurs. | Fri. | Sat. |
| 1 unit | 2 units | 1 unit | 2 units | 1 unit | 2 units | 1 unit |

So in a week they work together 10 units work. Thus, in three weeks, they would complete 30 units work.

19. (c) : Let the time taken by Asit, Arnold and Afzal to complete the work alone be *x*, *y* and *z* hours respectively.

Given, (*x* − 6) = (*y* − 1) = 

⇒ *y* = (*x* − 5) and z = (2*x* − 12)

Also, time taken by all of them to do the job

= 

substitute *y* = (*x* − 5) and *z* = (2*x* − 12) in the above equation we get *x* = h.

∴ Time taken by all the three to complete the work

= 

***Solutions for questions* *20 to 24:***

Set - A: 20 pipes can fill  tank in 20 minutes, so they can fill complete tank in.

Set - B: 20 pipes can fill tank in 12 minutes, so to fill the complete tank in.

Set - C: 16 pipes can empty  tank in 32 minutes, so to empty the complete tank it will take 64 minutes.

Let the capacity of tank = LCM (32, 32, 64) = 64 units.

20. (c) : Time taken to fill = 

= 

21. (b) : Work done by half of **Set - A** in 1 minute = 1 unit

Work done by half of **Set - B** in 1 minute = 1 unit

Work done by pipes of **Set - C** = 1 unit

So, tank (65%) will be full in

=  = 41.6 minutes.

22. (d) : Half the pipes are closed means it will now take out only 0.5 units.

So, time to fill the tank = 

= 

= 

=  minutes

23. (b) : Tank is half full = 32 minutes

only half the pipes of C are open

Time taken to empty = 

24. (c) : 5 pipes are added to A =  capacity increase

⇒ **Set - A** work in 1 minute = 2 × 1.25 = 2.5 units

⇒ **Set - B** work in 1 minute = 2 × 1.25 = 2.5 units

⇒ **Set - C** work in 1 minute = 1 × 1.2 = 1.2 units

Total work in 1 minute = 2.5 + 2.5 − 1.2 = 3.8 units

Time required to fill = 

Time = 7:32 a.m. +  ≈ 7:49 a.m.

25. (c) : We assume the work is = 360 units

Then, the part of the cistern filled by *X* and *Y* in first 2 minutes

=

The part of cistern filled by *Z* in first two minutes

= 

Remaining part = 

In 1 minute, all the three pipes together will fill = 

Hence, the time taken to fill the remaining cistern

= 

Thus, the total time taken to fill the remaining cistern  
 = 3.05 minutes.