|  |
| --- |
| **TIME & WORK** |

1. **A can do a piece of work in 30 days which B alone can do it in 20 days. In how many days will they finish the work, both working together?**

**LCM of 30 and 20 = 60**

**Here A is taking 20 days 🡪 60/20🡪3**

**B is taking 30 days 🡪60/30🡪2**

**Thus by combining both works**

**(60/(2 + 3)) = (60/5) = 12 days**

1. **A can do a piece of work in 36 days which B alone can do it in 45 days. In how many days will they finish the work, both working together?**

**LCM of 36 and 45 = 180 (180/(5 + 4)) = (180/9) = 20 days**

1. **A sum of money is sufficient to pay A’s wages for 21 days or B’s wages for 28 days. The money is sufficient to pay the wages of both for:**

**LCM of 21 and 28 = 84. The money is sufficient to pay the wages of both for**

**(84/4+3) = 12 days.**

1. **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?**

**LCM of 15, 10 and 6 = 30 (30/(2+3+5)) = (30/10) = 3 days**

1. **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?**

**RULE: (A + B) – A = B LCM of 8 and 12 = 24**

**Here to get B’s work we need to subtract A’s work from total work**

**Here lcm is 24 i.e 🡪1/24 amount of work each day**

**Now A’s work is 1/12 amount of work**

**A+B work together as 1/8 per hour**

**B’s work=total-A’s work**

**-->B=1/8-1/12**

**🡪1/24**

**I.e if we reverse(work) we get time taken by B to complete whole task**

**🡪24 hours to complete the whole work**

**Another method simply follow below’s and above (4--) problems solution**

1. **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:**
2. **42 days (b) 72 days (c) 84 days (d) 96 days**

**RULE: (A + B) – A = B LCM of 35 and 60 = 420**

**420/35🡪12 amount of work**

**A’s alone work will be 420/60🡪7**

**Now B requires lcm/(combinework-A’s work))**

**B requires = (420/(12 – 7)) = (420/5) = 84 days**

1. **A and B together can do a piece of work in 6 days and A alone can do it in 9 days. In how many days can B alone do it?**

**LCM of 6 and 9 is 18.**

**RULE: (A + B) – A = B**

**Lcm/(A+B’s efficiency-B’s efficiency)**

**Here A+B ‘s efficiency means lcm/time combinely took🡪6**

**18/6🡪3**

**And A’s efficiency is 18/9🡪2**

**Now B’s time taken will be below’s=**

**(18/(3 – 2)) = 18 days**

1. **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:**
2. **21 days (b) 16 days (c) 14 days (d) 9 days**

**Brief explaination of solving this kinds of problems same as prev ,here iam explaining in own words**

**Step1: first calculate lcm of all the terms given in question (ex🡪lcm(4,12,18) in this prob)**

**Step2:Now find the effiency of group and individuals by dividing the lcm with different persons values(times)**

**Step3:Now remove the individual efficiencies from the total efficiency**

**Step4:Then divide the lcm with above steps result**

**RULE: (A + B + C) – A – B = C LCM of 4, 12 and 18 = 36**

**= (36/9-3-2) = (36/4) = 9 days**

1. **A and B working together could mow a field (polam koyadam) in 28 days and with the help of C they could have mowed it in 21 days. How long would C take by himself?**

**Follow the same approach as of above**

**LCM of 28 and 21 = 84**

**(A + B + C) – (A + B) = C**

**(84/(4 – 3)) = 84 C alone can complete the work in 84 days.**

1. **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. In how many days will A, B and C finishes it, working all together?**

**RULE: (A + B) + (B + C) + (C + A) = 2(A + B + C) LCM of 12, 15 and 20 = 60**

**Implies (60/(5+4+3)) = (60/12) = 5 days//here we are adding**

**Therefore (A+B+C) will complete the work in (5x2) = 10 days//this is important**

1. **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?**
2. **12 (b) 13 (c) 16 (d) 26**

**RULE: (A + B) + (B + C) + (C + A) = 2(A + B + C) LCM of 18, 24 and 36 = 72**

**= (72/4+3+2) = (72/9) = 8 days//here by working 2 times they are taking 8 days ,**

**//if they work only single time they require prev\*2 times days**

**Therefore, all together can do it in (8x2) = 16 days**

1. **A and B can do a piece of work in 12 days, B and C in 15 days, C and A in 20 days. How long would each take separately to do the same work?**

**Total units of the work = LCM of 12, 15 and 20 = 60**

**RULE: (A + B) + (A + C) – (B + C) = 2A**

**(60/5 + 3 – 4) = (60/4) = 15 days. Means A alone can complete the work in 15 x 2 = 30 days**

**RULE: (A + B) + (B + C) – (A + C) = 2B**

**(60/5 + 4 – 3) = (60/6) = 10 days. Means B alone can complete the work in 10 x 2 = 20 days**

**RULE: (B + C) + (C + A) – (A + B) = 2C**

**(60/4 + 3 – 5) = (60/2) = 30 days. Means C alone can complete the work in 30 x 2 = 60 days**

1. **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?**
2. **150 days (b) 120 days (c) 100 days (d) 80 days**

**RULE: (A + B) + (A + C) – (B + C) = 2A LCM of 72, 120 and 90 = 360**

**= (360/5 + 4 – 3) = (360/6) = 60 days**

**Therefore A alone can complete the work in (60x2) = 120 days**

**RULE: “Capacity” means ‘the ability of a person to do a particular work’. It means ‘more capacity less time taken / less capacity more time taken’.**

1. **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:**
2. **6 (b) 6¼ (c) 7½ (d) 8**

**Capacities of A and B = 100 : 160 = 5 : 8**

**5 …………12 days**

**8 ………….? (more capacity, less time – indirect proportion)**

**= (5x12)/8 = (60/8) = 7½ days**

1. **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:**
2. **6½ days (b) 7½ days (c) 8 days (d) 9 days**

**Total work = LCM of 15 and 10 = 30 units**

**Capacities of A and B = 2 : 3**

**B works it for 5 days = 3 x 5 = 15 units Remaining work = 30 – 15 = 15**

**A can do it in (15/2) = 7½ days**

1. **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:**

**Capacities of A and B are 2 and 1 respectively.**

**3 capacity of A and B together can complete the work in 14 days, means, 2 capacity of A alone complete the work in (3 x 14/2) = 21 days.**

1. **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 how many days?**

**The capacities of A and B are 3 and 1 respectively.**

**B with capacity 1 can complete the work in x days.**

**A with capacity 3 can complete the work in (x – 10) days.**

**(Indirect proportion – less capacity more days – more capacity less days)**

**1x = 3(x – 10) or 2x = 30 or x = 15 days**

1. **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?**

**Capacities of A and B are 2 and 1 respectively. Capacities of A and B = 2 + 1 = 3**

**3 capacity …….18 days**

**2 capacity ………..(3 x 18/2) = 27 days**

1. **A and B together can do a piece of work in 7 days. If A does twice as much work as B in a given time, find how long A alone would take to do the work?**

**Capacities of A and B are 2 and 1 respectively.**

**3 capacities of A and B complete the work in 7 days. 2 capacity of A take (3 x 7/2) = 10 ½ days**

1. **A can do a work in 25 days and B can do it in 20 days. They work together for 5 days and then A goes away. In how many days will B finish the remaining work?**

**Total work = LCM of 20 and 25 = 100 units**

**Capacities are A and B are 4 and 5 respectively.**

**Work done by A and B in 1 day = 5 + 4 = 9 units**

**In 5 days they complete 9 x 5 = 45 units of work.**

**Remaining work = 100 – 45 = 55 units**

**B alone complete 55 units work in (55/5) = 11 days**

1. **16 men can do a piece of work in 10 days. How many men are needed to complete the work in 40 days?**

**To do a work in 10 days, 16 men are needed (or) to do the work in 1 day, (16 x 10) men are needed. So, to do the work in 40 days, (16x10/40) = 4 men are needed.**

1. **A can do a piece of work in 5 days. How many days will he take to complete 3 works of the same type?**

**He will take 3 x 5 = 15 days**

1. **A can do a work in 10 days. B takes 15 days to complete it. C takes as long as A and B would take working together. How long will it take A, B and C to complete the work together?**

**A in 10 days, B in 15 days. A and B together in (30/3 + 2) = 6 days**

**A in 10 days, B in 15 days and C in 6 days. LCM = 30**

**A, B and C together in (30/3+2+5) = 3 days**

1. **Ram can do (2/3) of a work in 16 days. In how many days can he finish (1/12) of the work?**

**2 parts of work can be done in 16 days means total (3 parts) of work can be done in 24 days.**

**(1/12) of the work can be done in (1/12)(24) = 2 days.**

1. **Sudhir can do (4/5) of a work in 8 days. In how many days can he finish (1/10) of the work?**

**4 parts of work can be done in 8 days means total (5 parts) of work can be done in 10 days. (1/10) of the work can be done in (1/10)(10) = 1 day.**

1. **Vinay can do (1/4) of a work in 5 days. In how many days can he finish (1/5) of the work?**

**Total work can be done in 4 x 5 = 20 days. (1/5) of the work can be done in**

**(1/5)(20) = 4 days**

1. **A certain number of men can do a work in 60 days. If there were 8 men less it could be finished in 10 days more. How many men were there?**

**60x = 70(x – 8) implies 10x = 560 or x = 56 men**

1. **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?**

**After two days, 3 men can complete the remaining work in 4 days.**

**When 3 more joined, 6 men can complete the work remaining work in 2 days.**

1. **A group of men decided to do a work in 10 days, but five of them became absent. If the rest of the group did the work in 12 days, find the original number of men?**

**x men …………10 days**

**(x – 5) men…………..12 days 10x = 12(x – 5)**

**On solving x = 30 men**

1. **There is a sufficient food for 400 men for 31 days. After 28 days, 280 men leave the place. For how many days will the rest of the food last for the rest of the men?**

**After 28 days, food is sufficient for 400 men for 3 days. For 400 – 280 = 120 people the food will last for more days.**

**400 men …………3 days**

**120 men …………(400 x 3/120) = 10 days**

1. **A can do a piece of work in 12 days. A does the work for 2 days only and leave the job. B does the remaining work in 5 days. In how many days B alone can do the complete work?**

**A’s 10 days work can be completed by B in 5 days. Similarly, A’s 12 days work can be completed by B in 6 days.**

1. **Mohan can mow his lawn in x hours. After 2 hours it begins to rain. The unmowed part of the lawn is:**

**Mohan mows the whole lawn in x hours. In 2 hours, he mows (2/x) of the lawn.**

**Therefore, unmowed part = 1 – (2/x) = (x – 2/x) part**

1. **If factory A turns out x cars an hour and factory B turns out y cars every 2 hours, the number of cars which both factories turn out in 8 hours is:**

**Factory A in 2 hours turns out ………..2x cars**

**Factory B in 2 hours turns out ………….y cars**

**In 2 hours both turn out (2x + y) cars and in 8 hours they turn out 4(2x + y) cars**

1. **A can complete a work in 6 days and B in 5 days. They work together, finish the job and receive Rs22000 as wages. B’s share should be:**

**Capacities of A and B are 5 : 6**

**We know that amount should be distributed on their capacities ratio but not on their days ratio.**

**B’s share = 22000(6/11) = Rs12000**

1. **A, B and C together earn Rs1500 per day while A and C together earn Rs940 and B and C together earn Rs760. The daily earning of C is:**

**C= (A + C) + (B + C) – (A + B + C) = 940 + 760 – 1500 = Rs200**

1. **A and B working separately can do a piece of work in 9 and 12 days respectively. If they work for a day alternately, A beginning, in how many days the work will be completed?**

**Capacities of A and B are 4 and 3 respectively.**

**Total units of work = LCM of 9 and 12 = 36 units**

**(A + B) in 2 days complete 7 units of work. Likewise 35 units of work can be done in 10 days**

**Remaining = 36 – 35 = 1 unit**

**On 11th day A will go to the work and completes the remaining work (1 unit) in (1/4)th of the day.**

**Therefore total work can be done in 10 + (1/4) = 10 ¼ days**