



# GENERAL APTITUDE

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# Time & Work

- Work (Effort) = Manpower x time.
- If A can do a piece of work in x days then work done by A in one day is equal to  $1/x$  of the entire work.
- If A is twice as good a workman as B then A will take half the time taken by B to do a same piece of work.
- If number of people to do a certain work is increased (or decreased) the time taken to do the same work will decrease (or increase)
- Total work = LCM
- Efficiency =  $(\text{Total work})/(\text{Total time})$
- OR
- Total work = Efficiency x Total time



## Time & Work

Q. A, B & C can complete a certain work in 10, 12 & 15 days respectively. If all of them work together in how many days will the work get completed?

SUNBEAM



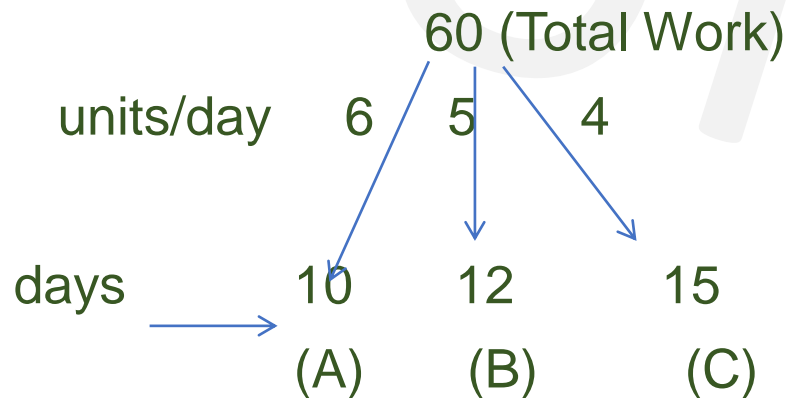
# Time & Work

Q. A, B & C can complete a certain work in 10, 12 & 15 days respectively. If all of them work together in how many days will the work get completed?

**Soln:**

We know, Total work = Days x units/day

$$\text{LCM}(10, 12, 15) = 60$$



In one day,  $A+B+C = 6+5+4 = 15$  units

So to complete TW = 60 units, days = ?

$$\text{days} = \frac{60}{15} = 4. \text{ So 4 days are needed to complete the work.}$$



# Time & Work

Q. Two persons A & B can complete a work in 20 & 30 days respectively. If both of them start together but A stops after 10 days then how many days will the work last?

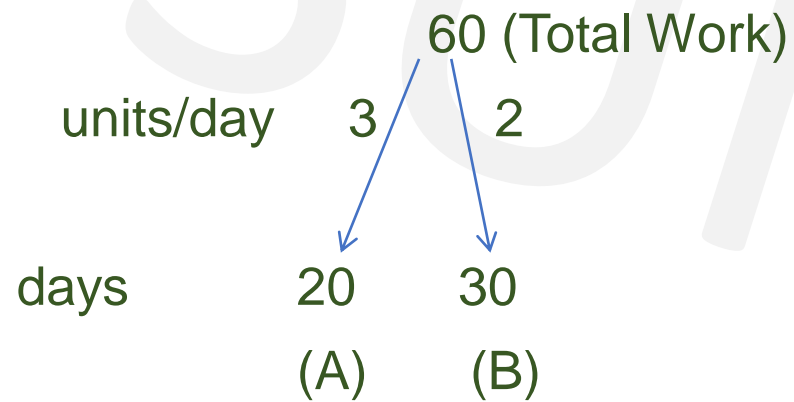
A. 7 days

B. 8 days

C. 15 days

D. 10 days

**Soln:** LCM(20,30) = 60



A after 10 days,  $3 \times 10 = 30$  units & B after 10 days =  $2 \times 10 = 20$  units

Total units = 60, Remaining units = total – A + B(after 10 days)  
 $= 60 - 50 = 10$  units

Days needed to do 10 units work =  $\frac{10}{2} = 5$  days

So Total Duration =  $10 + 5 = 15$  days

**Ans: C**



# Time & Work

Q. Two persons A & B can complete a work in 20 days , B & C can complete it in 24 days & C and A can complete it in 40 days. Find in how many days will B complete the work alone?

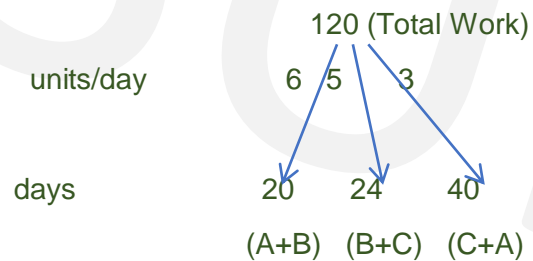
A. 30 days

B. 40 days

C. 50 days

D. 60 days

• **Soln:**  $\text{LCM}(20, 24, 40) = 120$



No of workers

↓  
 $2 \times (A+B+C) = 6+5+3 = 14$  i.e.  $2(A+B+C)$ 's 1 day work

$$A + B + C = 14/2 = 7$$

$$B = 7 - (A+C)$$

$$B \text{ alone} = 7 - 3 = 4 \text{ units/day}$$

$$\text{To find days needed by B} = \frac{\text{Total work}}{\text{units/day}} = \frac{120}{4} = 30 \text{ days}$$

So , 30 days are needed by B to complete the work alone.

**Ans :A**



# Time & Work

Q. A & B can do a piece of work in 20 & 16 days respectively. If they work on alternate days each starting with A in how many days was the work completed?

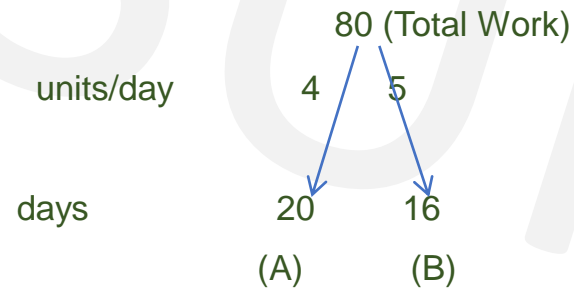
A. 19 days

B. 18 days

C. 16 days

D. 30 days

• **Soln:**  $\text{LCM}(20,16) = 80$



• Day 1, A = 4 units

• Day2, day 1 work added

• B = 5 + 4 = 9units

• 9 units --- 2 days

• 80 units --- ?

• Days =  $\frac{80 \times 2}{9} = \frac{160}{9} = 17.7777 = 17.78$  days

• **Ans B**



# Time & Work

- Efficiency = capacity to do work
- Efficiency and time are inversely proportional
- Efficiency  $\propto \frac{1}{T}$
- Efficiency and work are directly proportional
- Efficiency  $\propto W$





# Time & Work

Q. A is twice as efficient as B and completes a certain work in 12 days less than B. In how many days will both of them complete the same work?

A. 6 days

B. 8 days

C. 7 days

D. 3 days

Soln:

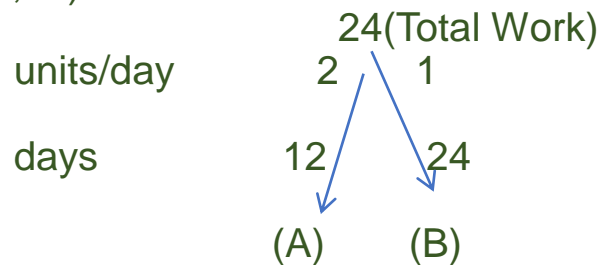
$$\begin{array}{ccc} \text{A} & & \text{B} \\ 2x & - & x \\ x & = & 12 \end{array}$$

$$x = 12$$

As, Efficiency  $\propto \frac{1}{T}$

A = 12 days and B =  $2x = 2 \times 12 = 24$  days

- LCM(12,24) = 24



$$A + B = 2 + 1 = 3 \text{ units/day}$$

$$\text{Days} = \frac{\text{TW}}{\text{units/day}} = \frac{24}{3} = 8 \text{ days}$$

**Ans B**

or

Days ratio is inversely proportional to efficiency ratio.

	$\frac{A}{2}$	$\frac{B}{1}$
Eff (Ratio)	1	2
Days (Ratio)	$x-12$	$x$
Days		

$\rightarrow 2(x-12) = x$   
 $\rightarrow x = 24 \text{ days}$   
 $\rightarrow x - 12$   
 $\rightarrow 24 - 12 = 12 \text{ days}$



# Time & Work

Q. A, B & C can complete a work in 10, 12 & 15 days respectively. All three together completed the work & they are paid Rs 6000. Find the share of C

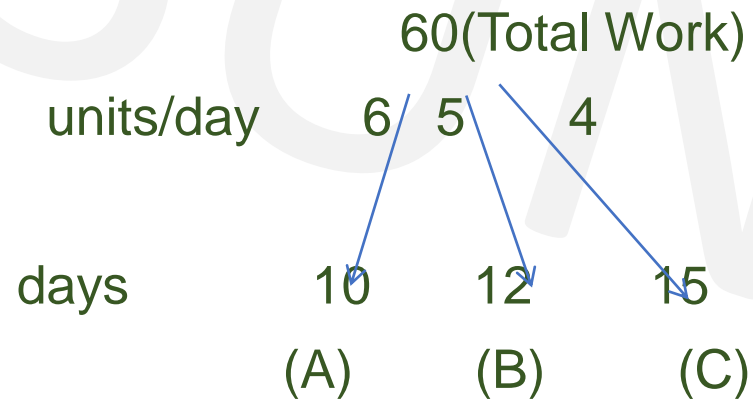
A. 3000

B. 2400

C. 2000

D. 1600

• **Soln:**  $\text{LCM}(10, 12, 15) = 60$



Together,

$$(A+B+C) = 6+5+4 = 15 \text{ units/day}$$

Total paid amount to (A+B+C) = 6000

$$C = \frac{4}{15} \times 6000$$

$$= \text{Rs. } 1600$$

**Ans: D**



# Time & Work(Assignment)

Q. Two persons A & B can complete a work in 24 & 30 days respectively. If both of them start together .After how many days should B stop working so that A completes the remaining work in 6 days?

A. 7 days

B. 8 days

C. 9 days

D. 10 days

**Ans D**



# Time & Work(Assignment)

Q. Two persons A & B can complete a work in 20 days , B & C can complete it in 30 days while C & A can complete it in 24 days. Find in how many days will B complete the work alone?

A. 36 days

B. 48 days

C. 56 days

D. 64 days

**Ans B**



# Time & Work(Assignment)

**Q.** A is thrice as good a workman as B and can finish a piece of work in 60 days less than B. Find the time to complete the work if both of them work together

A. 20 days    B. 22.5 days    C. 24.5 days    D. 22 days

**Ans: B**



# Time & Work(Assignment)

Q. 2 workers A & B can finish a job in 8 days and 12 days respectively ,after the completion of work they were paid Rs.200. Find share of B.

A. Rs. 120    B. Rs. 80    C. Rs. 40    D. Rs. 60

**Ans: B**



# Work & Time(Assignment)

Q. A, B & C can do a piece of work in 12, 20, & 30 days respectively. If A is assisted everyday alternately by B & C in how many days was the work completed?

A. 6 days

B. 8 days

C. 7 days

D. 3 days

**Ans: B**



# Work & Time(Assignment)

Q. A can do a piece of work in 10 days, B in 12 days and C in 15 days. They all start work together, but A leaves 2 days later and B leaves 3 days before completion of the work. In how many days was the work completed?

A. 7 days

B. 5 days

C. 8 days

D. 10 days

**Ans: A**





# Work & Time(Assignment)

Q. Apurva can do a job in 12 days. She and Amit completed the work together and were paid Rs.54 and Rs.81 respectively. How many days are needed to complete the job together?

A. 4.8 days

B.4.2 days

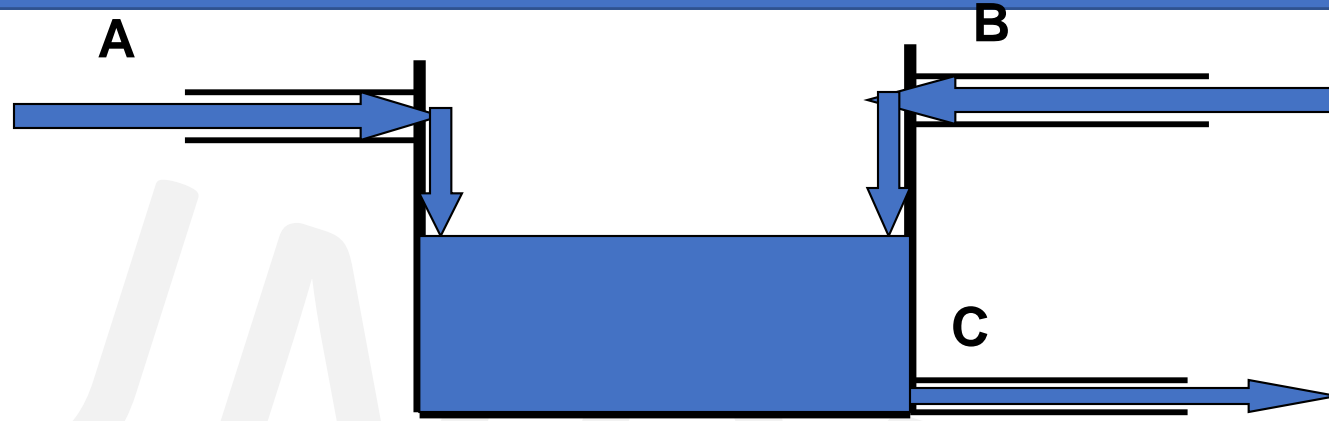
C. 4 days

D. 3.6 days

**Ans: A**



# Pipes & Cisterns



- A cistern may have inlet pipe or outlet pipe.
- Conventionally filling a tank is treated as positive work and emptying a tank as negative work.
- Net work done = (Sum of work done by inlets) – (sum of work done by outlets)

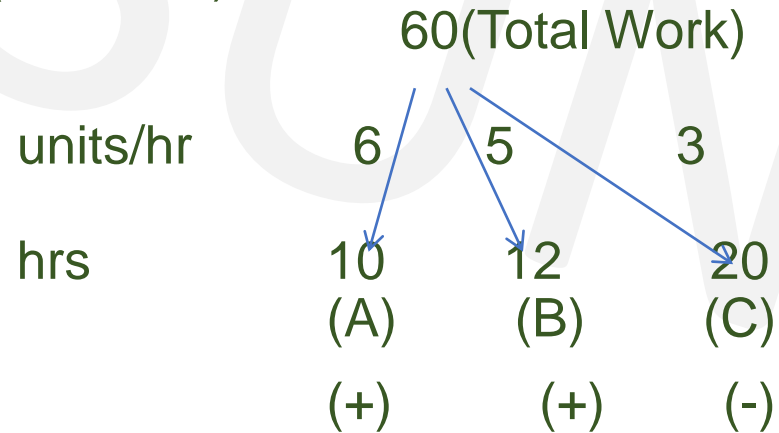


# Pipes & Cisterns

Q. Two pipes can fill the reservoir in 10 hours and 12 hours respectively. While third pipe empties full tank in 20 hours. If all the three pipes operate simultaneously , how much time will the tank be filled?

**Soln:**

- $\text{LCM}(10, 12, 20) = 60$



$$A+B = 6 + 5 = 11$$

As, C empties the tank so,  $11 - 3 = 8$  units/hr

Quantity filled in 1 hour if all the pipes are opened together

$$\text{Time to fill} = \frac{\text{TW}}{\text{units/hr}} = \frac{60}{8} = 15/2 \text{ hrs}$$



# Pipes & Cisterns

Q. Two pipes A and B can fill a tank in 24 minutes and 32 minutes respectively. If both the pipes are opened simultaneously, after how much time should B be closed so that the tank is full in 18 minutes

A . 2 min

B. 4 min

C. 6 min

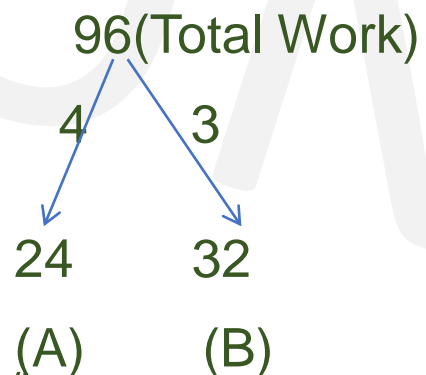
D.8 min

**Soln:**

$$\text{LCM}(24,32) = 96$$

units/hr

hrs



$$\text{WD} = \text{time} \times \text{units/hr}$$

Work done by A alone =  $18 \times 4 = 72$  units

Remaining work = Total units – work done by A =  $96 - 72 = 24$  units

B should be closed after  $= \frac{24}{3} = 8$  mins.

**Ans : D**



# Pipes & Cisterns

Q. 12 buckets of water fill a tank when the capacity of each bucket is 13.5 litres. How many buckets will be needed to fill the same tank, if the capacity of each bucket is 9 litres?

A. 8

B. 15

C. 16

D. 18

**Ans: D**

Capacity of the tank =  $(12 \times 13.5)$  litre  
= 162 litres

Capacity of each bucket = 9 litres

Number of buckets needed =  $162 / 9$   
= 18 buckets



# Pipes & Cisterns

Q. Bucket P has thrice the capacity as bucket Q. It takes 60 turns for bucket P to fill the empty tank. How many turns it will take for both P and Q, having each turn together to fill the tank?

- A. 30                      B. 40                      C. 45                      D. 90

**Soln-**

$$P = 3Q$$

60 turns of P = capacity of tank

$$60P = \text{capacity of tank}$$

$$60(3Q) = \text{capacity of tank}$$

$$180Q = \text{capacity of tank}$$

P+Q work together.

Amount of water poured together = P + Q

$$= 3Q + Q = 4Q$$

$$\text{Number of turns} = 180Q/4Q = 45 \text{ turns}$$

**Ans: C**



# Pipes & Cisterns(Assignment)

Q. There are 3 pipes attached to a tank A, B & C. A alone can fill the tank in 60 min, B can fill the tank in 45 min & C can empty the full tank in 30 min. If all three pipes are opened together in how much time will the tank be full?

A. 5 hrs

B. 4 hrs

C. 3 hrs

D. 2 hrs

**Ans: C**



# Pipes & Cisterns(Assignment)

Q. A pump can fill a tank with water in 2 hours. Because of a leak, it took  $2\frac{1}{3}$  hours to fill the tank. The leak can drain all the water of the tank in:

- A.  $4\frac{1}{3}$  hours      B. 7 hours      C. 8 hours      D. 14 hours

• **Soln :**

• Work done =  $\frac{XY}{Y-X}$  where, X = number of hrs to fill tank , Y = number of hrs to fill tank with leakage

•  $2\frac{1}{3} = \frac{7}{3}$

• Work done =  $\frac{2 \times \frac{7}{3}}{\frac{7}{3} - 2} = \frac{\frac{14}{3}}{\frac{1}{3}} = 14$

• Leak will empty the tank in 14 hours

• **Ans: D**





# Pipes & Cisterns(Assignment)

Q. Two pipes A and B can fill a cistern in  $37\frac{1}{2}$  minutes and 45 minutes respectively. Both pipes are opened. The cistern will be filled in just half an hour, if B is turned off after:

A. 5 mins

B. 9 mins

C. 10 mins

D. 15 mins

**Ans : B**



# Pipes and Cisterns(Assignment)

Q. Two pipes A & B can fill the cistern in 20 min & 25 min respectively. Both are opened together but at the end of 5 min B is turned off. How much total time will the cistern take to fill up?

- A. 5 min      B. 10 min      C. 12 min      D. 16 min

**Ans: D**



# Pipes and Cisterns(Assignment)

Q. Two pipes A and B can fill a tank in 36 minutes and 45 minutes respectively. Another pipe C can empty the tank in 30 minutes. First A and B are opened. After 7 minutes, C is also opened. The tank is filled up in

- A. 39 minutes      B. 46 minutes      C. 40 minutes      D. 45 minutes

**Ans: B**



# Pipes and Cisterns(Assignment)

Q. Two pipes A and B can fill a tank in 15 minutes and 20 minutes respectively. Both the pipes are opened together but after 4 minutes, pipe A is turned off. What is the total time required to fill the tank?

- A. 10 min. 20 sec.
- B. 11 min. 45 sec.
- C. 12 min. 30 sec.
- D. 14 min. 40 sec.

**Ans: D**



# Chain Rule

- In earlier problems the rate of doing work of each person or pipe varied.
- In chain rule problems all entities are of the same efficiency or work capacity.
- The entities may be men, women, tractors, engines, pumps, horses, lawn mowers etc.
- Work Done = No. of Men x Days x Hrs/day
- $W = M \times D \times H$
- $W_1 = M_1 \times D_1 \times H_1$ ,  $W_2 = M_2 \times D_2 \times H_2$
- $$\frac{W_1}{W_2} = \frac{M_1 \times D_1 \times H_1}{M_2 \times D_2 \times H_2}$$



# Chain Rule

Q. 18 men working for 5 hours per day can complete a job in 8 days. How many men working for 8 hours a day for 6 days will be required?

A. 24

B. 15

C. 16

D. 17

Men x Days x Hrs/day = Work Done

## Case 1

$18 \times 8 \times 5 = 720 \text{ man-hrs}$

## Case 2

$M \times 6 \times 8 = 720 \text{ man-hrs}$

$M \times 6 \times 8 = 18 \times 8 \times 5$

$M = 15$

**Ans B**



# Chain Rule

Q. 20 men or 40 women working for 9 hours a day can finish a work in 80 days. In how many days will 10 men & 10 women working together for 12 hours a day finish the work?

A. 60 days      B. 70 days      C. 80 days      D. 90 days

Men x Days x Hrs/day = Work Done

Also 20 Men = 40 Women  $\rightarrow$  1M = 2 W (convert to one unit i.e. women or children)

20 men ---- 40 women

1men ----- ? (2women)

## Case 1

40W x 80 x 9 = work

## Case 2

(20W + 10W) x D x 12 = work

30W x D x 12 = 40W x 80 x 9

D = 80 days

**Ans C**



# Chain Rule

Q. 8 men or 12 women or 16 children working for 8 hours a day can finish a work in 52 days. In how many days will 1 man & 1 woman & 1 child working together for 8 hours a day finish the work?

- A. 180 days                      B. 192 days                      C. 216 days                      D. 164 days

- **Men x Days x Hrs/day = Work Done**

- Also 8 Men = 16 children  $\rightarrow 1M = 2C$

- And 12 Women = 16 children  $\rightarrow 1W = \frac{4}{3}C$

- **Case 1**

- $16C \times 52 \times 8 = \text{work}$

- **Case 2**

- $(2C + \frac{4}{3}C + C) \times D \times 8 = \text{work}$

- $(2C + \frac{4}{3}C + C) \times D \times 8 = 16C \times 52 \times 8$

- $\frac{13C}{3} \times D \times 8 = 16C \times 52 \times 8$

- $D = 192 \text{ days}$

**Ans: B**





# Chain Rule

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

A. 2 : 1

B. 3 : 1

C. 3 : 2

D. 5 : 4

**Soln:**

$$W = M \times D$$

and

$$W = M \times D$$

$$\begin{aligned} W &= (12m + 16b) \times 5 \\ &= 60m + 80b \end{aligned}$$

$$\begin{aligned} W &= (13m + 24b) \times 4 \\ &= 52m + 96b \end{aligned}$$

As , work done is same, equating both sides ,we get,

$$60m + 80b = 52m + 96b$$

$$60m - 52m = 96b - 80b$$

$$8m = 16b$$

$$m = 2b \quad m : b = 2 : 1$$

**Ans: A**



## Chain Rule(Assignment)

Q. 12 men & 18 women working together for 9 hours a day finish the work in 150 days.  
30 men & 15 women working together for 10 hours a day finish the work in 81 days. In how many days will 12 men & 12 women working together for 12 hours a day finish the work?

- A. 115 days    B. 120 days    C. 130 days    D. 135 days

**Ans: D**



# Chain Rule(Assignment)

Q. 24 workers working 8 hours a day can construct a wall in 5 days. In how many days can 45 workers working 4 hours a day construct 3 such walls?

- A. 18 days      B. 16 days      C. 4 days      D. 7 days

**Ans : B**



# Chain Rule(Assignment)

Q. 24 workers working 5 hours a day can construct a bungalow in 8 days. In how many days can 40 workers working 8 hours a day construct 2 such bungalows?

A. 3 days

B. 6 days

C. 4 days

D. 8 days

**Ans : B**



# Chain Rule(Assignment)

Q. 32 painters working 5 hours a day can paint a building in 10 days. In how many days can 40 workers working 6 hours a day paint 3 such buildings?

A. 10 days

B. 16 days

C. 20 days

D. 28 days

**Ans : C**



# Chain Rule(Assignment)

Q. 8 men or 12 women can construct a wall in 33 days . In how many days can 10men and 21 women construct the wall.

A. 10 days

B. 11 days

C. 22 days

D. 15 days

**Ans : B**



# Chain Rule(Assignment)

Q.36 men working for 12 hours a day can build a wall 45 mt long, 52 mt high & 63 mt broad in 91 days. In how many days will 80 men working for 9 hours a day build a wall 50 mt long, 72 mt high & 30 mt broad ?

A. 24 days

B. 35 days

C. 40 days

D. 47 days

Men x Days x Hrs/day

= Work Done (Volume of Wall)

## Case 1

$$36 \times 91 \times 12$$

$$= 45 \times 52 \times 63$$

## Case 2

$$80 \times D \times 9$$

$$36 \times 91 \times 12$$

$$= \frac{50 \times 72 \times 30}{45 \times 52 \times 63}$$

$$45 \times 52 \times 63$$

$$\text{Ans C} \quad D = 40 \text{ days}$$



# Chain Rule(Assignment)

Q. 12 men or 18 women can construct a wall in 33 days . In how many days can 20men and 24 women construct the wall.

A. 10 days

B. 11 days

C. 22 days

D. 15 days

**Ans : B**





# Chain Rule(Assignment)

Q. 12 men can do a piece of work in 24 days. How many days are needed to complete the work, if 8 men do this work ?

- A. 28 days
- B. 36 days
- C. 48 days
- D. 52 days

**Ans: B**



# Interest

If P = Principal, R = Rate of interest, N = Time in years, I = Interest, A = Amount

Then  $A = P + I$

## Simple Interest

$$S.I. = (P \times R \times N) / 100$$

Basic principal remains constant.

S.I. is good example of AP(Arithmetic Progression)

## Compound Interest

$$A = P (1 + R/100)^T$$

T = periods of compounding,

$$C.I. = A - P$$

R = rate for compounding period

Basic principal keeps on increasing as we get interest on interest.

C.I. is good example of GP(Geometric Progression)



# Interest

Q. A shopkeeper with an OD facility at 18% with a bank borrowed Rs. 15000 on Jan 8, 2011 and returned the money on June 3, 2011 so as to clear the debt. The amount that he paid was -

- A. Rs. 16080      B. Rs. 16280      C. Rs. 16400      D. None of these

**Soln:**

- $P = 15000$ ,  $r = 18\%$ ,
- $T = 23(\text{jan}) + 28(\text{feb Nonleap}) + 31(\text{march}) + 30(\text{April}) + 31(\text{may}) + 3(\text{june}) = 146$  days
- $146/365$  days =  $2/5$  years.
- $SI = 15000 \times 18 \times 2/5 \times 1/100 = 30 \times 18 \times 2 = 1080$

Amount =  $P + SI$

$$= 15000 + 1080$$

$$= \text{Rs. } 16080$$

**Ans: A**



# Interest

Q. A sum of money at simple interest amounts to Rs. 815 in 3 years and to Rs. 854 in 4 years. The sum is:

A. Rs. 650

B. Rs. 690

C. Rs. 698

D. Rs. 700

Soln:-

amount after 4 years = amount after 3 years + simple interest in one year

S.I. in one year = Rs.  $(854 - 815) = \text{Rs. } 39$ .

S.I. for 3 years = Rs.  $(39 \times 3) = \text{Rs. } 117$ .

Principal = amount - interest

Principal =  $815 - 117$   
= Rs. 698.

**Ans: C**



# Interest

Q. A farmer borrowed Rs.3600 at 15% simple interest per annum. At the end of 4 years, he cleared this account by paying Rs.4000 and a donkey. The cost of the donkey is -

A. Rs. 1000

B. Rs. 1200

C. Rs. 1550

D. Rs. 1760

**Soln:**

SI for 4 years = Rs.  $(3600 \times 0.15 \times 4) = \text{Rs. } 2160$

Amount after 4 years = Rs.  $(3600 + 2160) = \text{Rs. } 5760$

Cost of donkey = Rs.  $(5760 - 4000) = \text{Rs. } 1760$

**Ans: D**



# Interest

Q. P =Rs. 2000, R =10%, N =2yrs , Find A and CI

**Soln:**

$$\begin{aligned}A &= 2000\left(1 + \frac{10}{100}\right)^2 \\&= 2000\left(\frac{110}{100}\right)^2 \\&= 2000\left(\frac{121}{100}\right) \\&= \text{Rs. } 2420\end{aligned}$$

$$\text{CI} = 2420 - 2000 = \text{Rs. } 420$$

$$2000 \rightarrow 10\% = 200$$

$$10\% \quad 10\%$$

$$2000 \longrightarrow 2200 \longrightarrow 2420$$

$$\text{CI} = 2420 - 2000 = 420$$



# Interest

Q. Simple interest on a certain sum of money for 3 years at 8% per annum is half the compound interest on Rs. 4000 for 2 years at 10% per annum. The sum placed on simple interest is:

A. Rs. 1550

B. Rs. 1650

C. Rs. 1750

D. Rs. 2000

Soln:

$$A = P \left( 1 + \frac{R}{100} \right)^N = 4000 \left( 1 + \frac{10}{100} \right)^2 = 4000 \times \left( \frac{11}{10} \right)^2 = 4000 \times \frac{11}{10} \times \frac{11}{10} = \text{Rs. } 4840$$

OR

$$\begin{array}{ccccc} 4000 & \xrightarrow[1^{\text{st}} \text{ yr}]{10\%} & 4400 & \xrightarrow[2^{\text{nd}} \text{ yr}]{10\%} & 4840 \end{array}$$

$$CI = A - P$$

$$CI = 4840 - 4000 = \text{Rs. } 840$$

**Ans: C**

$$SI = \frac{1}{2} CI$$

$$\frac{PNR}{100} = \frac{1}{2} \times 840$$

$$\frac{P \times 3 \times 8}{100} = 420$$

$$\begin{aligned} P(\text{sum}) &= \frac{420 \times 100}{3 \times 8} \\ &= \text{Rs. } 1750 \end{aligned}$$



# Interest

Q. P = Rs. 4000, R = 20% per annum, N = 6 months. Find CI computed quarterly for given period.

Soln:

N = 6 months (2 quarterly)

rate(R) = 20 % per annum = 5 % quarterly

After every 3 months CI will be calculated.

	by <u>5%=200</u>		by <u>5%=210</u>	
4000		4200		4410

$$\begin{aligned} I &= 4410 - 4000 \\ &= \text{Rs. } 410 \end{aligned}$$





# Interest

Q. Difference between Compound interest & simple interest on a sum placed at 8% p.a. compounded annually for 2 years is Rs 128. Find the Principal

- A. 20000
- B. 24000
- C. 26000
- D. 15000

- **Soln:**

- Let the principal be  $P = \text{Rs. } 100$ .
- time  $N = 2$  years, rate of interest  $R = 8\%$  per annum
- simple interest =  $\frac{PNR}{100} = \frac{100 \times 8 \times 2}{100} = \text{Rs. } 16$

- CI (for 2 years)

- $\begin{array}{ccc} & 8\% & 8\% \\ 100 & \xrightarrow{\quad} & 108 \xrightarrow{\quad} & 116.64 \end{array}$

	16.64		
P	SI	CI	Diff
100	16	16.64	0.64

- $0.64 \rightarrow 100$
- $128 \rightarrow ?$
- $\frac{12800}{0.64} = \text{Rs. } 20000$



# Interest

Q. Difference between Compound interest & simple interest on a sum placed at 8% p.a. compounded annually for 2 years is Rs 128. Find the principal

- A. 20000
- B. 24000
- C. 26000
- D. 15000

• **Soln:**

- Let the principal be  $P = \text{Rs. } 100$ .
- time  $N = 2$  years, rate of interest  $R = 8\%$  per annum
- simple interest =  $\frac{PNR}{100} = \frac{100 \times 8 \times 2}{100} = \text{Rs. } 16$
- compound amount =  $P(1 + \frac{R}{100})^N$
- $= 100 \times (1 + \frac{8}{100})^2 = 100 \times (\frac{108}{100})^2 = 100 \times (\frac{11664}{10000}) = \frac{11664}{100} = 116.64$
- compound interest = compound amount – principal
- $C.I = A - P$   
 $= 116.64 - 100 = \text{Rs. } 16.64$
- the difference between the compound interest and simple interest =  $16.64 - 16.00 = \text{Rs. } 0.64$
- $0.64 \rightarrow 100$
- $128 \rightarrow ?$
- $= \frac{128 \times 100}{0.64} = 20000$
- Thus, the principal is Rs. 20000.

# Interest

- If the difference between compound and simple interest is of **two years** than,  
**Difference =  $P(R)^2/(100)^2$**   
Where P = principal amount, R = rate of interest
- If the difference between compound and simple interest is of **three years** than,  
**Difference =  $3 \times P(R)^2/(100)^2 + P (R/100)^3$** .  
Here also, P = principal amount, R = rate of interest



# Partnership

Q.A started business with Rs. 45,000 and B joined afterwards with 30,000. If the profit at the end of a year was divided in the ratio 2 : 1 respectively, then B would have joined A for business after.

A. 1 month

B. 2 months

C. 3 months

D. 4 months

**Soln:**

- Capital of A = Rs. 45,000                      Capital of B = Rs. 30,000
- Ratio of P1:P2=2:1
- using formula,
- $\frac{C_1T_1}{C_2T_2} = \frac{P_1}{P_2}$
- In this type , the time period is 12 months i.e. one year
- $\frac{45000 \times 12}{30000 \times T_2} = \frac{2}{1}$
- $T_2=9$
- B would join business after  $(12 - 9) = 3$  months
- **Ans: C**



# Partnership

Q. If 4 (A's capital) = 6 (B's capital) = 10 (C's capital), then out of a profit of Rs. 4650, C will receive \_\_\_\_\_

A) Rs.700

B) Rs.800

C) Rs.900

D) Rs.1000

**Soln:**

$$4A = 6B = 10C$$

$$A = 10/4C = 5/2C \quad \text{and} \quad B = 10/6C = 5/3C$$

$$A + B + C = 4650$$

$$5/2C + 5/3C + C = 4650$$

$$C = 900$$

Share of C or C will receive Rs.900

**Ans: C**



# Partnership

Q. A, B & C enter into a partnership with total of Rs 8,200. A's capital is Rs 1000 more than B's & Rs 2000 less than C's. What is B's share of annual profit of Rs 2,460?

A. Rs 1320

B. Rs 720

C. Rs 420

D. Rs 520

**Ans: C**



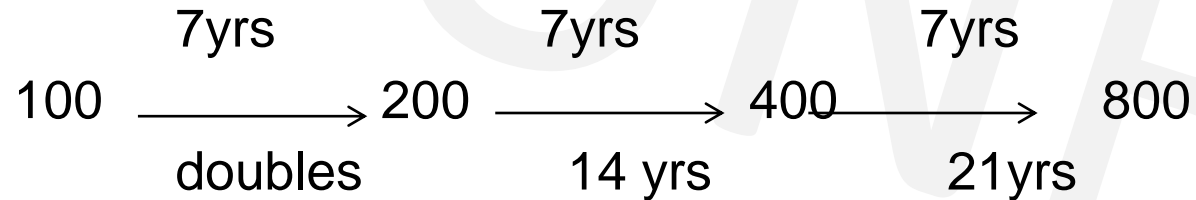
# Interest(Assignment)

Q. A sum of money placed at compound interest doubles in 7 years. In how many years the principal becomes-

- a. 4 times of itself
- b. 8 times of itself

Soln:

Let initial value be 100



- a. In 14yrs
- b. In 21 yrs

**OR**

100----->200 in 7 years  
200----->400 in again 7 years then,  
400----->800 in 7 years again, thus  
the time becomes=  $7+7+7= 21$  years.



# Interest(Assignment)

Q. A started a business by investing Rs. 32000. After 2 months B joined him with some investments. At the end of the year the total profit was divided in the ratio 8:5. How much capital was invested by B?

A. Rs. 30,000      B. Rs. 28000      C. Rs. 24000      D. Rs. 19000

- Soln:
- using formula,
- $\frac{C_1 T_1}{C_2 T_2} = \frac{P_1}{P_2}$
- $\frac{32000 \times 12}{C_2 \times 10} = \frac{8}{5}$
- $C_2 = \text{Rs. } 24000$

**Ans: C**





# Interest(Assignment)

Q. When annual compounding is done, a sum amounts to Rs 5000 in 6 years and 7200 in 8 years.  
What is the int rate?

A. 10%

B. 15%

C. 20%

D. 25%

## Soln

Let P be the principal & R the int rate

$$\rightarrow 5000 = P(1+R/100)^6 \dots (1)$$

$$\rightarrow 7200 = P(1+R/100)^8 \dots (2)$$

$$\rightarrow 36/25 = (1+R/100)^2$$

$\rightarrow$  Taking square roots of both sides

$$\rightarrow 1+R/100 = 6/5$$

$$\rightarrow R/100 = 1/5$$

$$\rightarrow R = 20\%$$

**Ans: C**



# Interest(Assignment)

Q. A sum fetched a total simple interest of Rs.7056 at the rate of 8 percent per year in 7 years. What is the sum?

A. Rs 12600

B) Rs 15120

C) Rs 10080

D) Rs 7560

**Ans : A**



## Interest(Assignment)

Q. Find the compound interest on Rs. 15,625 for 9 months at 16% per annum compounded quarterly.

A. Rs. 1851

B. Rs. 1941

C. Rs. 1951

D. Rs. 1961

**Ans: C**



## Interest(Assignment)

Q. What is the difference between the simple interest on a principal of Rs. 500 being calculated at 5% per annum for 3 years and 4% per annum for 4 years?

A.Rs. 5      B.Rs. 10      C.Rs. 20      D.Rs. 40      E. None of these

$$\begin{aligned} SI_1 &= P N_1 R_1 / 100 \\ &= \frac{500 \times 3 \times 5}{100} = \text{Rs. } 75 \end{aligned}$$

$$\begin{aligned} SI_2 &= P N_2 R_2 / 100 \\ &= \frac{500 \times 4 \times 4}{100} = \text{Rs. } 80 \end{aligned}$$

$$\text{Difference} = 80 - 75 = \text{Rs. } 5$$

**OR**

$$500 \Rightarrow 15\% \uparrow \Rightarrow 575 \text{ (1<sup>st</sup> case)}$$

$$500 \Rightarrow 16\% \uparrow \Rightarrow 580 \text{ (2<sup>nd</sup> case)}$$

$$\text{difference} = 580 - 575 = \text{Rs. } 5$$

**Ans : A**



# Interest(Assignment)

Q. A sum of money placed at compound interest doubles itself in 4 years. In how many years will it amount to 8 times?

A. 9 years

B. 8 years

C. 27 years

D. 12 years

**Ans: D**



# Interest(Assignment)

Q. Difference between Compound interest & simple interest on a sum placed at 20% per annum compounded annually for 2 years is Rs. 72. Find the sum.

A. Rs. 2400

B. Rs. 8400

C. Rs. 1800

D. Rs. 900

**Ans : C**



# Interest(Assignment)

Q. What is the simple interest on a sum of Rs. 700 if the rate of interest for the first 3 years is 8% per annum and for the last 2 years is 7.5% per annum?

A.Rs. 269.5   B.Rs. 283   C.Rs. 273   D.Rs. 280   E. None of these

**Ans: C**



# Interest(Assignment)

Q. Rs.2100 is lent at compound interest of 5% per annum for 2 years. Find the amount after two years.

- A.Rs. 2300      B.Rs. 2315.25      C.Rs. 2310      D.Rs. 2320      E. None of these

• **Soln:**

•  $A = P ( 1 + R/100 )^T$

•  $A = 2100(1+5/100)^2$

•  $A = 2100 \times [105/100]^2$

•  $A = \frac{2100 \times 11025}{10000}$

• Amount, A=Rs.2315.25

• **Ans : B**





# Interest(Assignment)

Q. A man borrowed total Rs 2500 at Simple interest from two money lenders. He paid interest at 12% p.a. to one and 14% p.a. to the other. The total interest paid for the year was Rs.326. How much did he borrow at 14%?

A. Rs 1000

B. Rs 1200

C. Rs 1300

D. Rs 1500

**Soln:**

Let,  $x$  = Principal at 12%

&

$2500-x$  = Principal at 14%

$$\text{SI at Rs. } x = \frac{x \times 1 \times 12}{100} = \frac{12x}{100} = \frac{3x}{25}$$

$$\text{SI at Rs. } 2500 - x = \frac{2500 - x \times 1 \times 14}{100} = \frac{(2500 - x) \times 7}{50} = \frac{17500 - 7x}{50}$$

$$\text{SI at } x + \text{SI at } 2500 - x = 326$$

Substitute and solving the equation gives  $x = \text{Rs. } 1200$

We need Principal at  $2500 - x = 2500 - 1200 = \text{Rs. } 1300$

**Ans: C**



# Interest(Assignment)

Q.A certain sum of money amounts to Rs. 704 in two years and Rs 800 in 5 years. Find the Principal.

A. Rs. 640

B. Rs. 600

C. Rs. 550

D. Rs. 450

**Ans: A**



# Interest(Assignment)

Q. A started a business by investing Rs. 32000. After 4 months B joined him with some investments. At the end of the year the total profit was divided in the ratio 6:5. How much capital was invested by B?

A. Rs. 30,000

B. Rs. 28000

C. Rs. 40000

D. Rs. 19000

**Ans: C**



# Interest(Assignment)

Q. Three persons started a placement business with a capital of Rs. 3000. B invests Rs. 600 less than A and C invests Rs. 300 less than B. What is B's share in a profit of Rs. 886 ?

- A. Rs. 443
- B. Rs. 354.40
- C. Rs. 265.80
- D. Rs. 177.20

**Ans: C**



# Interest(Assignment)

Q. What should be the simple interest obtained on an amount of Rs 5,760 at the rate of 6% p.a. after 3 years?

- A. Rs 1036.80
- B. Rs 1666.80
- C. Rs 1336.80
- D. Rs 1063.80
- E. None of these

**Ans : A**



# Interest(Assignment)

Q. Anand and Deepak started a business investing Rs.22,500 and Rs.35,000 respectively. Out of a total profit of Rs. 13,800. Deepak's share is

A. Rs 9600

B. Rs 8500

C. Rs 8450

D. Rs 8400

**Ans: D**

Ratio of their shares-

= 22500 : 35000

= 9 : 14

Deepak's share = Rs.(13800×14/23)

= Rs. 8400



# Interest(Assignment)

Q. A started a business with Rs. 21,000 and is joined afterwards by B with Rs. 36,000. After how many months did B join if the profits at the end of the year are divided equally?

A. 4

B. 5

C. 6

D. 7

**Ans: B**

- Capital of A = Rs. 21000
- Capital of B = Rs. 36000
- Ratio of P1:P2=1:1
- using formula,
- $\frac{C_1 T_1}{C_2 T_2} = \frac{P_1}{P_2}$
- In this type , the time period is 12 months i.e. one year
- $\frac{21000 \times 12}{36000 \times T_2} = \frac{1}{1}$
- $T_2 = 7$
- B would join business after  $(12 - 7) = 5$  months



# Interest(Assignment)

Q. A,B,C subscribes Rs. 50000 for a buisness. A subscribes Rs. 4000 more than B and B Rs. 5000 more than C. Out of a total profit of Rs. 35000, A receives :

- A. Rs. 8400
- B. Rs. 11900
- C. Rs. 13600
- D. Rs. 14700

**Ans: D**





# Interest(Assignment)

Q. The simple interest on Rs.1820 from March 9, 2012 to May 21, 2012 at 7.5% rate will be

- A. Rs. 22.50
- B. Rs. 27.30
- C. Rs. 28.80
- D. Rs. 29

**Ans: B**



