Aptitude Partnership Concepts and Formulas

Points to remember:

1) **Partnership:** It refers to a business association between two or more than two persons who run a business together and share the total profit at an agreed proportion. The persons who enter into a partnership are called partners.

2) **Working partner:** A partner who is actively involved in the business and manages the business is known as an active partner.

3) **Sleeping partner:** A partner who invests money but does not involve or look after the business is known as a sleeping partner.

4) **Simple partnership:** It refers to a partnership in which each partner invests capital for the same period.

5) **Compound partnership:** It refers to a partnership in which the partners invest capital for different periods.

Some Quicker Methods:

1) If two partners invest capital Rs. C1 and Rs. C2 for the same period and earn profit Rs. P, the share of the partners in the profit is given by;

Rs $\left(\frac{C1*P}{C1+C2}\right)$ and Rs $\left(\frac{C2*P}{C1+C2}\right)$

Similarly, If there are three partners who invest Rs. C1, Rs. C2 and Rs. C3 for the same period and earn total profit Rs. P, the shares of the partners in the profit are given by;

Rs $\left(\frac{C1*P}{C1+C2+C3}\right)$, Rs $\left(\frac{C2*P}{C1+C2+C3}\right)$, Rs $\left(\frac{C3*P}{C1+C2+C3}\right)$

2) If two partners invest capital Rs. C1 and Rs. C2 for different periods T1 and T2 respectively and earn total profit Rs. P, shares of the partners in the profit are given by;

Rs $\left(\frac{C1*T1*P}{C1T1+C2T2}\right)$ and Rs $\left(\frac{C2*T2*P}{C1T1+C2T2}\right)$

Similarly, if there are three partners who invest Rs. C1, Rs. C2 and Rs. C3 for different periods T1, T2 and T3 respectively and earn total profit Rs. P, the shares of the partners in the profit are given by:

Rs $\left(\frac{C1*T1*P}{C1T1+C2T2+C3T3}\right)$, Rs $\left(\frac{C2*T2*P}{C1T1+C2T2+C3T3}\right)$ and $\left(\frac{C3*T3*P}{C1T1+C2T2+C3T3}\right)$

3) If two partners invest capital C1 and C2 for the periods T1 and T2, respectively, the ratio of their profits is given by:

$$\frac{\text{Profit of A}}{\text{Profit of B}} = \frac{C1*T1}{C2*T2}$$

Similarly, if three partners A, B, and C invest Rs. C1, Rs. C2 and Rs. C3 for different periods T1, T2, and T3 respectively then the ratio of their profits is given by:

Profit of A: Profit of B: Profit of C = C1*T1: C2*T2: C3*T3

If three partners invest capital in the ratio C1: C2: C3 and earn a profit in the ratio P1:P2: P3, the ratio of the time for which they have invested capital is given by:

T1:T2:T3 = $\frac{P1}{C1} * \frac{P2}{C2} * \frac{P3}{C3}$

Problems:

1) Sohan started a business with a capital of Rs. 80000. After 6 months Mohan joined as a partner by investing Rs. 65000. After one year they earned total profit Rs. 20000. What is share of Sohan in the profit?

A. Rs. 5222.2

B. Rs. 14222.2

C. Rs. 6222.2

D. Rs. 6777.7

The Correct answer is (B)

Explanation:

Sohan's capital be C1 = 80000

Mohan's capital be C2 = 65000

Sohan's time be T1 = 12 months

Mohan's time be T2 = 6 months

Profit earned = 20000

Apply formula: $\frac{C1 * T1 * P}{C1T1 + C2T2}$

Therefore, Sohan's share = $\frac{80000 * 12 * 20000}{80000 * 12 + 65000 * 6}$

$= \frac{19200000000}{960000 + 390000}$

$= \frac{19200000000}{1350000} = \frac{780000}{135} = 14222.2$

Solution: 2

Ratio of their profits = $\frac{\text{Profit of Sohan}}{\text{Profit of Mohan}} = \frac{C1*T1}{C2*T2}$

$= \frac{C1*T1}{C2*T2} = \frac{80000*12}{65000*6} = \frac{960000}{390000} = \frac{32}{13}$

Therefore, Profit of Sohan: Profit of Mohan = 32:13

Then, Sohan's share = $\frac{32}{45}$ * 20000= 14222.2

2) A, B and C are partners. They have invested Rs.35000, Rs. 25000 and 10,000 respectively for the same period. If the total profit is Rs. 18000, find the share of A.

A. Rs. 9000

B. Rs. 9500

C. Rs. 8000

D. Rs. 8500

The Correct answer is (A)

Explanation:

A's capital be C1= 35000

B's capital be C2= 25000

C's capital be C3= 10000

Profit = 18000

T1=T2=T3

Apply formula: $\frac{C1*P}{C1+C2+C3}$

$$\text{Share of A} = \frac{35000*18000}{35000+25000+10000} = \frac{630000000}{70000} = 9000$$

Solution 2:

Ratio of their profits;

Profit of A: Profit of B: Profit of C = C1*T1: C2*T2:C3*T3

Time is same for A, B and C.

So, Profit of A: Profit of B: Profit of C = C1: C2: C3

= 35000:25000:10000

= 7:5:2

A's share = (A's ratio/ sum of all three ratios)* total profit

$$\text{So, share of A: } \frac{7}{14} * 18000 = 9000$$

3) A's and B's shares in a business are in the ratio of 5:3. If A has invested Rs. 70000 for 12 months, for what period B has invested Rs. 60000?

A. 7 months

B. 7.4 months

C. 8 months

D. 8.4 months

The Correct answer is (D)

Explanation:

A's capital be C1 = 70000

B's capital be C2 = 60000

A's time be T1= 12 months

Let B's time be T2 = X months

A's share: B's share = 5:3

Apply formula: $\frac{\text{Profit of A}}{\text{Profit of B}} = \frac{C1 * T1}{C2 * T2}$

$\frac{5}{3} = \frac{C1 * T1}{C2 * T2}$

$\frac{5}{3} = \frac{70000 * 12}{60000 * X}$

300000 X = 2520000

$X = \frac{252}{30} = 8.4 \text{ months}$

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4) Suresh started a business by investing a certain amount of money. Rakesh joined him after four months by investing Rs. 50000. If after one year Suresh and Rakesh share the profit in the ratio of 10:8, how much capital did Suresh invest?

A. Rs. 42000

B. Rs. 44000

C. Rs. 47000

D. Rs. 41666.7

The Correct answer is (D)

Explanation:

Let Suresh's capital be C1 = X

Rakesh's capital be C2 = 50000

Suresh's Time be T1 = 12 months

Rakesh's Time be T2 = 8 months

Suresh's profit: Rakesh's profit = 10:8

Apply formula: $\frac{\text{Profit of Suresh}}{\text{Profit of Rakesh}} = \frac{C1 * T1}{C2 * T2}$

$$\frac{10}{8} = \frac{X*12}{50000*8}$$

$$X = \frac{4000000}{96}$$

X = 41666.7

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5) A and B enter into a partnership by investing Rs.14000 and Rs. 16000 respectively. After 8 months, C joins them with a capital of Rs.12000. Find the share of C in a total profit of Rs. 57000 after 2 years.

A. Rs.12000

B. Rs.12500

C. Rs.13000

D. Rs.13500

The Correct answer is (A)

Explanation:

A's capital be C1 = 14000

B's capital be C2 = 16000

C's capital be C3 = 12000

A's time be T1 = 24 months

B's time be T2 = 24 months

C's time be T3 = 16 months

Profit: 57000

Apply formula: Profit of A: Profit of B: Profit of C = C1*T1: C2*T2:C3*T3

= 14000*24: 16000*24:12000*16

= 336000:384000:192000

= 7: 8: 4

C's share = $\frac{4}{19}$ * 57000 = 12000 (Option A)

Solution 2:

Apply formula : $\left(\frac{C3*T3*P}{C1T1+C2T2+C3T3}\right)$

$$= \left(\frac{12000*16*57000}{14000*24+16000*24+12000*16}\right)$$

$$= \frac{10944000000}{336000+384000+192000}$$

$$= \frac{10944000}{912} = 12000$$

6) Ramesh and Suresh enter into a partnership with capitals in the ratio of 10:12. At the end of 8 months, Ramesh withdraws. If they receive profits in the ratio of 10:18. Find how long Suresh's capital was used.

A. 7 months

B. 8 months

C. 10 months

D. 12 months

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Answer: D

Explanation:

Let the capital of Ramesh (C1) =10

And the capital of Suresh is (C2) = 12

Time period spend by Ramesh (T1) = 8 months

Let, time period spend by Suresh (T2) = x months

The ratio of their profit (p1:p2) is 10: 18

Apply formula: (C1 * T1)/ (C2 * T2) = p1/p2

(10 * 8)/ (12*x) = (10/18)

(80/12x) = (5/9)

20/3x = 5/9

180 = 15x

Hence, x=12 months

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7) Raju started a business with Rs. 900. Kamal joined him after few months with an amount of 600. If the profits at the end of the year were divided in the ratio of 2:1, after how many months Kamal joined the business?

A. 9 months

B. 3 months

C. 8 months

D. 5 months

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Answer: B

Explanation:

The capital of Raju (C1) =900

And the capital of Kamal is (C2) = 600

Time period spend by Raju (T1) = 12 months

Let the time period spend by Kamal (T2) = x months

The ratio of their profit (p1:p2) is 2: 1

Apply the formula:

(C1 * T1)/ (C2 * T2) = p1/p2

(900 * 12)/ (600*x) = (2/1)

10800/600 = 2* x

x= 18/2

x= 9 months, i.e., Kamal spend 9 months.

So, Kamal joined after, 12 - 9= 3 months.

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8) Mahesh and Suresh rent a pasture for 12 months. Mahesh puts in 200 cows for 8 months. How many cows can Suresh put in the pasture for the remaining 4 months if he pays 1(1/2) as much as Mahesh?

A. 450 cows

B. 600 cows

C. 300 cows

D. 520 cows

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Answer: B

Explanation:

Let Mahesh's cow (C1) = 200 cows, and time spend T1 = 8 months

Suresh's cow (C2) = y cows, and time spend T2 = 4 months

Let the profit of Mahesh = x

Then the profit of Suresh = 1(1/2)*x

Apply profit ratio formula:

(C1 * T1)/ (C2 * T2) = p1/p2

(200 * 8)/ (y*4) = (x/ (3x/2))

400/y = 2x/3x

400/y = 2/3

y = (400*3)/2

y= 600

Hence, Suresh can put 600 cows for the remaining 4 months.

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9) X and Y enter into a partnership for a year. X invests Rs. 6000, and Y invests Rs. 8000. After 4 months, they admit Z, who invests Rs. 9000. If Y withdraws his contribution after 6 months, how would they share a profit of Rs 1000 at the end of the year?

A. 350, 300, 350

B. 375, 250, 375

C. 400, 300, 300

D. 100, 600,300

Answer: B

Explanation:

X's capital be C1 = 6000

Y's capital be C2 = 8000

Z's capital be C3 = 9000

X's time be T1 = 12 months

Y's time be T2 = 6 months

Z's time be T3 = 8 months

Profit = 1000

The profit will be divided in the ratio:-

(C1 * T1): (C2 * T2): (C3 * T3)

(6000*12): (8000*6): (9000*8)

i.e., 72000: 48000: 72000

Or, 72:48:72

Divide the whole equation by 24.

The ratio will be 3: 2: 3

Sum of the ratios will be 3+2+3= 8

Apply formula:

X's share = (X's ratio/ sum of all three ratios)* total profit

Hence, X's share is (3/8) * 10000 = 375

X's and Z's share are equal in ratio, so Z's share =375

Y's share = 1000 - (A + B)'s share

= 1000 - 750 = 250

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10) Praveen and Sunny enter into a partnership. Praveen puts in Rs. 50 and Sunny put in Rs. 45. At the end of 4 months Praveen withdraws half of his capital, and at the end of 6 months, Sunny withdraws half of his capital. Ashu Bhati then enters with a capital of Rs. 70. At the end of 12 months, in what ratio will the profit be divided?

A. 65:32:56

B. 54:60:66

C. 84:82:80

D. 80:81:84

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Answer: D

Explanation:

Let Praveen's capital is C1 = 50 for period T1= 4 months, and C11= 25 for period T11= 8

Sunny's capital is C2 = 45 for period T2 = 6 months, and C22 = 45/2 for period T22= 6 months.

Ashu Bhati's capital is C3 = 70 for period T3 = 6 months.

Now, apply the profit ratio formula:

(C1 * T1): (C2 * T2): (C3 * T3) = p1: p2: p3

But here we have 2 different values for Praveen and Sunny.

So, (C1 * T1 + C11 * T11): (C2 * T2 + C22 * T22): (C3 * T3) = p1: p2: p3

Now, (50*4 + 25*8): (45*6 + (45*2)/6): (70*6) = p1: p2: p3

The ratio of their profit is p1: p2: p3 = 400: 405: 420

Divide all ratios by 25.

Hence, the ratio will be 80: 81: 84