

12. PARTNERSHIP

Partnership

When two or more than two persons run a business jointly, they are called partners in the business, and the deal between them is known as partnership.

Partnership is of two types:

1. Simple Partnership
2. Compound Partnership

1. Simple Partnership: When investments of all the partners are for the same period of time, the profit or loss is distributed among the partners in the ratio of their original investments.

Suppose A and B invest $RS. p$ and $RS. q$ respectively for a year in a business, then at the end of the year. Share of A's profit (loss): Share of B's profit (loss) = $p : q$.

2. Compound Partnership: When investments of all the partners are for different period of time, then equivalent capitals are calculated for a unit of time and the profit or loss is divided in the ratio of the product of time and investment.

Suppose A and B invest $RS. p$ and $RS. q$ for x months and y months respectively, then Share of A's profit (loss): Share of B's profit.(loss) = $p x : qy$.

Partners are of two types

- (i) Working Partner, and
- (ii) Sleeping Partner . .

(i) Working Partner : A partner who manages the business is called a working partner.

(ii) Sleeping Partner : A partner who only invests the money is called a sleeping partner.

Example 1: A and B started a business with capitals of $RS. 25000$ and $RS. 40000$ respectively. Find the share of A and B out of an annual profit of $RS. 6500$.

Solution . Ratio of shares of A and B = Ratio of their investments = $25000 : 40000 = 5 : 8$

$$A's \text{ share} = RS. \left(\frac{5}{13} \times 6500 \right) = RS. 2500$$

$$\text{and } B's \text{ share} = RS. \frac{8}{13} \times 6500 = RS. 4000$$

Example 2: A, B and C start a business each investing $RS. 16000$. After 3 months A withdrew $RS. 2000$, B withdrew $RS. 4000$ and C invests $RS. 8000$ more. At the end of the year a total profit of $RS. 41580$ made. Find the share of A, B, and C

Solution . Ratio of capitals of A, B and C

$$= (16000 \times 3 + 14000 \times 9) : (16000 \times 3 + 12000 \times 9) : (16000 \times 3 + 24000 \times 9)$$

$$= 174000 : 156000 : 264000 = 29 : 26 : 44$$

$$A's \text{ share} = RS. \left(\frac{29}{99} \times 41580 \right) = RS. 12180$$

$$B's \text{ share} = RS. \frac{26}{99} \times 41580 = RS. 10920$$

$$C's \text{ share} = RS. \frac{44}{99} \times 41580 = RS. 18480$$

Example 3 : A, B and C enter into a partnership with a total of $RS. 8200$. A's capital is $RS. 1000$ more than B's and $RS. 2000$ less than C's. What is B's share of the year's profit of $RS. 2,460$?

Solution Given, $A = B + 1000 = C - 2000$

$$C = B + 3000$$

$$A + B + C = (B + 1000) + (B) + (B + 3000)$$

$$8200 = 3B + 4000 \Rightarrow 3B = 8200 - 4000 \Rightarrow B = RS. 1400$$

$$\text{Share of profit of } B = RS. \frac{1400}{8200} \times 2460 = RS. 420$$

EXERCISE

1. A, B and C started a business by investing *Rs.* 28000, *Rs.* 35000 and *Rs.* 14000 respectively. At the end of a year they got a total profit of *Rs.* 5225. Find A's share
 (a) *Rs.* 1740 (b) *Rs.* 1850
 (c) *Rs.* 1900 (d) *Rs.* 1650
2. A, B and C started a business by investing *Rs.* 45000, *Rs.* 55000 and *Rs.* 60000 respectively. At the end of a year they got a total profit of *Rs.* 11200. Find how much B gets more than A in the profit
 (a) *Rs.* 700 (b) *Rs.* 750
 (c) *Rs.* 710 (d) *Rs.* 780
3. A and B started a business with investments *Rs.* 42000 and *Rs.* 63000 respectively. After 4 months B withdraws from the business. At the end of a year they got *Rs.* 9600 as total profit. Find the share of B.
 (a) *Rs.* 5600 (b) *Rs.* 2800
 (c) *Rs.* 3200 (d) *Rs.* 6400
4. Ajay and Abhay started a business with investments of *Rs.* 13000 and *Rs.* 39000 respectively. After 5 months Arun joins with a capital of *Rs.* 52000. At the end of a year they got a profit of *Rs.* 14250. Find the share of C.
 (a) *Rs.* 3650 (b) *Rs.* 5250
 (c) *Rs.* 6750 (d) *Rs.* 2250
5. P and Q started a business with capitals of *Rs.* 25000 and *Rs.* 40000 respectively. Find the ratio of investments?
 (a) 5:2 (b) 5:3
 (c) 5:8 (d) 5:10
6. Three partners started a business with *Rs.* 80000. At the end of the year they receive *Rs.* 1800, *Rs.* 3000 and *Rs.* 4800 as profit. Find the investment of the second person.
 (a) *Rs.* 25000 (b) *Rs.* 40000
 (c) *Rs.* 15000 (d) *Rs.* 32000
7. A and B together invested *Rs.* 12000 in a business. At the end of the year, out of a total profit *Rs.* 1800. A's share was *Rs.* 750. What was the investment of A?
 (a) *Rs.* 5000 (b) *Rs.* 10000
 (c) *Rs.* 12000 (d) *Rs.* 15000
8. A started a business with *Rs.* 18000. After 4 months B joins with *Rs.* 24000. After 2 more months C joins with *Rs.* 30000. At the end of 10 months C received *Rs.* 1850 as his share. Find the total profit.
 (a) *Rs.* 7955 (b) *Rs.* 7030
 (c) *Rs.* 8510 (d) *Rs.* 6845
9. A, B and C enter into a partnership. A contributes 320 for 4 months, B contributes *Rs.* 510 for 3 months, and C contributes *Rs.* 270 for 5 months. If the total profit is *Rs.* 208, find the profit share of the partner A.
 (a) *Rs.* 76.50 (b) *Rs.* 64
 (c) *Rs.* 67.50 (d) *Rs.* 46
10. Three hikers A, B and C start on a trip with *Rs.* 50 each and agree to share the expenses equally. If at the end of the trip, A has *Rs.* 20 left with him, B *Rs.* 30 and C *Rs.* 40, how must they settle their accounts?
 (a) A will pay *Rs.* 10 to C
 (b) C will pay *Rs.* 10 to B
 (c) B will pay *Rs.* 10 to C
 (d) C will pay *Rs.* 10 to A
11. *Rs.* 1290 is divided between A, B and C so that A's share is $1\frac{1}{2}$ times B's and B's share is $1\frac{3}{4}$ times C's. What is C's share?
 (a) *Rs.* 200 (b) *Rs.* 400
 (c) *Rs.* 240 (d) *Rs.* 420
12. What amount of money is divided between A, B and C if B and C together get *Rs.* 100 and A gets twice as much as B while C with A gets *Rs.* 150?
 (a) *Rs.* 200 (b) *Rs.* 250
 (c) *Rs.* 300 (d) *Rs.* 350
13. A and B entered into partnership with capitals in the ratio of 4 : 5. After 3 months, A withdrew $\frac{1}{4}$ of his capital and B withdrew $\frac{1}{5}$ of his capital. The gain at the end of 10 months was *Rs.* 760. Find their shares of profit,
 (a) *Rs.* 330, *Rs.* 440 (b) *Rs.* 330, *Rs.* 430
 (c) *Rs.* 340, *Rs.* 440 (d) *Rs.* 340, *Rs.* 430
14. Radhika and Renuka enter into a partnership with investment of *Rs.* 50000 and *Rs.* 70000 respectively. Renuka gets 10% of the total profit for maintaining the business and the remaining profit is distributed between them in the ratio of their investments. If

the total profit at the end of the years is *Rs.* 30000, find the total share of Renuka.

- (a) *Rs.* 16575 (b) *Rs.* 15750
(c) *Rs.* 18750 (d) *Rs.* 11250

15. A, B and C invest *Rs.* 4000, 5000 and 6000 respectively in a business and A gets 25% of profit for managing the business, the rest of the profit is divided by A, B and C in proportion to their investment. If in a year, A gets *Rs.* 200 less than B and C together, what was the total profit for that year?

- (a) *Rs.* 1000 (b) *Rs.* 1500
(c) *Rs.* 1800 (d) *Rs.* 2000

16. P and Q invested *Rs.* 8000 and *Rs.* 4000 in a partnership business. Each partner received 5% interest on the capital invested. At the end of year, there was a profit of *Rs.* 10000. What was the share of each partner (excluding interest)?

- (a) *Rs.* 6000, *Rs.* 3000
(b) *Rs.* 6100, *Rs.* 3900
(c) *Rs.* 6267, *Rs.* 3133
(d) *Rs.* 6348, *Rs.* 3200

17. A, B and C enter in to a partnership with investment in the ratio 4: 3: 2. After 4 months A and B withdraw half of their capital and after 7 months C added $\frac{2}{5}$ of his capital. Find the share of B in the total profit of *Rs.* 12600 at the end of the year.

- (a) *Rs.* 3600 (b) *Rs.* 4800
(c) *Rs.* 4200 (d) *Rs.* 3900

18. Two partners invested *Rs.* 1250 and *Rs.* 850 respectively in a business. Both the partners distribute 60% of the profit equally and distribute the rest 40% as the interest on their capitals. If one partner received *Rs.* 30 more than the other, find the total profit.

- (a) *Rs.* 300 (b) *Rs.* 393.75
(c) *Rs.* 384.50 (d) *Rs.* 400

19. A and B enter into a partnership with capitals in the ratio 2 : 3. At the end of 9 months A withdraws from the business. If their profits are in the ratio 1: 2, how long did B invest his capital ?

- (a) 12 months (b) 8 months
(c) 10 months (d) 11 months

20. A, B and C start a business with investments of *Rs.* 90000, *Rs.* 60000

and *Rs.* 45000 respectively. A and B leave the business after a few months at the same time. At the end of the year, they share the profits in the ratio of 6 : 4 : 9. After how many months did A and B leave the business ?

- (a) 6 months (b) 2 months
(c) 3 months (d) 4 months

21. Four transport companies A, B, C and D rented a parking place. A kept 12 cars for 5 months, B kept 20 cars for 6 months, C kept 15 cars for 5 months and D kept 30 cars for 6 months in the parking place. If A's share of rent is *Rs.* 2400 the total rent of the parking place is

- (a) *Rs.* 17400 (b) *Rs.* 18600
(c) *Rs.* 16500 (d) *Rs.* 19200

22. A and B entered in to a partnership with investments of *Rs.* 15000 and *Rs.* 40000 respectively. After 3 months A left from the business, at the same time C joins with *Rs.* 30000, At the end of 9 months they got *Rs.* 7800 as profit. Find the share of B.

- (a) *Rs.* 4800 (b) *Rs.* 600
(c) *Rs.* 2400 (d) *Rs.* 1200

ANSWER KEY											
1	c	5	c	9	b	13	b	17	a	21	a
2	a	6	a	10	d	14	c	18	b	22	a
3	c	7	a	11	c	15	d	19	a		
4	b	8	d	12	a	16	c	20	d		

SOLUTIONS

1. Ratio of shares of A, B and C = Ratio of their investments = 28000: 35000: 14000
= 4 : 5 : 2

$$\therefore \text{A's share} = \text{Rs.} \left(\frac{4}{11} \times 5225 \right) = \text{Rs.} 1900$$

2. Ratio of shares of A, B and C = Ratio of their investments = 45000: 55000: 60000
= 9:11:12

$$\text{A's share} = \text{Rs.} \left(\frac{9}{32} \times 11200 \right) = \text{Rs.} 3150$$

$$\text{B's share} = \text{Rs.} \left(\frac{11}{32} \times 11200 \right) = \text{Rs.} 3850$$

$$\therefore \text{B's share more than A} \\ = \text{Rs.} (3850 - 3150) = \text{Rs.} 700$$

3. Ratio of capitals of A and B
= (42000 × 12) : (63000 × 4) = 2 : 1

$$\text{B's share} = \text{Rs.} \left(\frac{1}{3} \times 9600 \right) = \text{Rs.} 3200$$

4. Ratio of capitals of Ajay, Abhay and Arun = (13000 × 12) : (39000 × 12) : (52000 × 7) = 3 : 9 : 7

$$\text{C's share} = \text{Rs.} \left(\frac{7}{19} \times 14250 \right) = \text{Rs.} 5250$$

5. Ratio of their investments = 25000:40000
= $\frac{25000}{40000} = \frac{5}{8}$
= 5:8

6. The ratio of profit of the three persons
= 1800:3000:4800 = 3 : 5 : 8

\therefore Investment of the second person

$$= \text{Rs.} \left(\frac{5}{16} \times 80000 \right) = \text{Rs.} 25000$$

7. Since profits are shared in the ratio of their investments

$$\therefore \frac{\text{A's investment}}{\text{B's investment}} = \frac{\text{Profit share of A}}{\text{Profit share of B}}$$

Money invested by A and B for the same Period

$$= \frac{750}{1800 - 750} = \frac{750}{1050} = \frac{5}{7}$$

$$\therefore \text{Investment of A} = \frac{5}{5+7} \times 12000$$

$$= \text{Rs.} 5000$$

8. Ratio of capitals of A, B and C

$$= (18000 \times 10) : (24000 \times 6) : (30000 \times 4) = 15 : 12 : 10$$

Let the total profit be Rs. x

$$\text{C's share} = \text{Rs.} \frac{10x}{37}$$

$$\therefore \frac{10x}{37} = 1850$$

$$\Rightarrow x = \frac{1850 \times 37}{10} = 6845$$

Hence, the total profit is Rs. 6845.

9. A's profit : B's profit; C's profit
= MEI of A : MEI of B : MEI of C
= 320 × 4 : 510 × 3 : 270 × 5
= 1280 : 1530 : 1350
= 128 : 153 : 135

$$= \frac{128}{128 + 153 + 135} \times 208$$

$$\therefore \text{Profit of A} = \frac{128}{416} \times 208 = \text{Rs.} 64$$

10. They start with total of Rs. (50 × 3) = Rs. 150 and they return after the trip with (20 + 30 + 40) = Rs. 90

So, to settle their accounts, each person must have Rs. $\frac{9}{3} = \text{Rs.} 30$ with them.

Hence, C must pay Rs. 10 to A.

11. A : B = $1 \frac{1}{2} : 1 = 3 : 2 = 3 \times 7 : 2 \times 7$
= 21 : 14

$$\text{B} : \text{C} = 1 \frac{3}{4} : 1 = 7 : 4 = 7 \times 2 : 4 \times 2$$

$$= 14 : 8$$

$$\therefore \text{A} : \text{B} : \text{C} = 21 : 14 : 8$$

$$\therefore \text{Cs share} = \frac{8}{21+14+8} \times 1290 = \text{Rs.} 240$$

12. Given, B + C = 100 and A + C = 150

$$\therefore \text{A} = 2\text{B},$$

$$\therefore 2\text{B} + \text{C} = 150$$

$$\Rightarrow \text{B} + (\text{B} + \text{C}) = 150 \text{ (Since } \text{B} + \text{C} = 100)$$

$$\therefore \text{B} = 150 - 100 = 50$$

$$\therefore \text{A} + \text{B} + \text{C} = (\text{A} + \text{C}) + \text{B}$$

$$= 150 + 50 = \text{Rs.} 200.$$

13. Ratio of capitals of A and B is 4 : 5. Let, the capitals of A and B be Rs. 4x and 5x respectively. Hence, monthly equivalent of investment of A.

$$= (3 \times 4x) + \left[7 \times 4x \times \frac{3}{4} \right] = 33x$$

(Since A invested $\frac{3}{4} \times 4x$ for 7 months)
Similarly, monthly equivalent of investment of B,

$$= (3 \times 5x) + \left[7 \times 5x \times \frac{4}{5} \right] = 43x$$

(since B invested $\frac{4}{5} \times 5x$ for 7 months)

$$\therefore \frac{\text{Profit share of A}}{\text{profit share of B}} = \frac{33x}{43x}$$

$$\therefore \text{Profit of A} = \frac{33}{(33+43)} \times 760 = \text{Rs. } 330$$

$$\therefore \text{Profit of B} = \frac{43}{(33+43)} \times 760 = \text{Rs. } 430$$

14. Ratio of capital of Radhika and Renuka = 50000 : 70000 = 5 : 7

Share of Renuka for maintaining the business = Rs. $\left(\frac{10}{100} \times 30000 \right) = \text{Rs. } 3000$

Remaining profit = Rs. (30000 - 3000) = Rs. 27000

Renuka's share in the remaining profit = Rs. $\left(\frac{7}{12} \times 27000 \right) = \text{Rs. } 15750$

Hence, Renuka's total share = Rs. (15750 + 3000) = Rs. 18750

15. After giving 25% of the total profit amount to A for managing the business, the rest 75% of total profit is divided among A, B and C in proportion to their investments. In 75% of total profit
A's share : B's share : C share = 4000 : 5000 : 6000

\therefore 75% of total profit = $4x + 5x + 6x$

\therefore Total profit = $\frac{15x}{75\%} = 20x$

\therefore Share of A = $4x + 25\%$ of $20x = 9x$

Share of B = $5x = 5x$

Share of C = $6x$

Given,

$$(5x + 6x) - 9x = 200$$

$$\Rightarrow x = 100$$

\therefore Total profit = $20x = 20 \times 100 = \text{Rs. } 2000$

16. Interest paid to P = $\frac{5}{100} \times 8000 = 400$

Interest paid to Q = $\frac{5}{4} \times 54000 = 2 : 1$

Net profit for distribution

= Rs. (10000 - 600) = Rs. 9400

Ratio of profit = 8000 : 4000 = 2 : 1

\therefore Share of P = $\frac{2}{3} \times 9400 = \text{Rs. } 6267$

and Share of Q = $\frac{1}{3} \times 9400 = \text{Rs. } 3133$

17. Let their initial investments be $4x$, $3x$ and $2x$

Ratio of the capitals of A, B and C is

$$\left[(4x \times 4) + \left(4x - \frac{4x}{2} \right) \times 8 \right] : \left[(3x \times 4) + \left(3x - \frac{3x}{2} \right) \times 8 \right] : \left[(2x \times 7) + \left\{ 2x + \frac{2x \times 2}{5} \right\} \times 5 \right]$$

$$= (16x + 16x) : (12x + 12x) :$$

$$(14x + 14x) = 32x : 24x : 28x$$

$$= 8 : 6 : 7$$

B's share = Rs. $\left(\frac{6}{21} \times 12600 \right) = \text{Rs. } 3600$

18. Since 60% of the profit is distributed equally. So, one partner receives Rs. 30 more than the other only due to distribution of rest 40% of the basis of their invested capitals.

$$\therefore \frac{\text{A's 40\% profit}}{\text{B's 40\% profit}} = \frac{1250}{850} = \frac{25}{17}$$

$$\Rightarrow \frac{\text{A's 40\% profit} + \text{B's 40\% profit}}{\text{A's 40\% profit} - \text{B's 40\% profit}} = \frac{25 + 17}{25 - 17}$$

$$\Rightarrow \frac{40\% \text{ of profit}}{30} = \frac{42}{8}$$

$$\Rightarrow \text{Profit} = \frac{42}{8} \times 30 \times \frac{100}{40} = \text{Rs. } 393.75$$

$$\therefore \text{Total profit is Rs. } 393.75$$

(By componendo and dividendo)

$$\Rightarrow \frac{40\% \text{ of profit}}{30} = \frac{42}{8}$$

$$\Rightarrow \text{Profit} = \frac{42}{8} \times 30 \times \frac{100}{40} = \text{Rs. } 393.75$$

\therefore Total profit is Rs. 393.75.

19. Let the initial investments of A and B be Rs. $2x$ and Rs. $3x$ respectively. Let B invest for a period of y months. Then, ratio of capitals of A and B = $(2x \times 9) : (3x \times y) = 1 : 2$

$$\Rightarrow \frac{18x}{3x \times y} = \frac{1}{2}$$

$$\Rightarrow \frac{6}{y} = \frac{1}{2} \Rightarrow y = 12$$

20. Let A and B leave the business after x months

Ratio of capitals of A, B and C is

$$= 90000 \times x : 60000 \times x : 450000 \times 12$$

$$= 3x : 2x : 18$$

But, $3x : 2x : 18 = 6 : 4 : 9$

$$\Rightarrow \frac{2x}{18} = \frac{4}{9}$$

$$\Rightarrow x = \frac{18 \times 4}{2 \times 9} = 4$$

Hence, A and B left the business after 4 months.

21. Ratio of shares of A, B, C and D

$$\begin{aligned} &= (12 \times 5) : (20 \times 6) : (15 \times 5) : (30 \times 6) \\ &= 60 : 120 : 75 : 180 \\ &= 4 : 8 : 5 : 12 \end{aligned}$$

Let the total rent for the parking place be $RS.$

x

$$\text{Then, A's share} = RS. \left(\frac{4x}{29} \right)$$

$$\therefore \frac{4x}{29} = 2400$$

$$\Rightarrow x = \frac{2400 \times 29}{4} = 17400$$

22. Ratio of capitals of A, B and C

$$= (15000 \times 3) : (40000 \times 9) : (30000 \times 6)$$

$$= 1 : 8 : 4$$

$$\text{B's share} = RS. \left(\frac{8}{13} \times 7800 \right) = RS. 4800$$

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