Partnership

INTRODUCTION

In *partnership,* two or more persons carry on a business and share the profits of the business at an agreed proportion. Persons who have entered into partnership with one another are individually called *partners* and collectively called a *firm* and the name under which their business is carried on is called the *firm name.* The partnership may be simple or compound.

Simple partnership is one in which the capital of each partner is in the business for same time.

Compound partnership is one in which the capitals of partners are invested for different periods.

Again partner can be working partner or sleeping partner.

Sleeping partner is one who invests the capital in the business but does not actively participate in the conduct of business.

Working partner besides investing capital, takes part in running the business. For his work, he is either paid some salary or given a certain per cent of profit, in addition.

SOME BASIC FORMULAE

1. (*a*) If capitals of two partners be ₹C_1 and ₹C_2 for the same period and the total profit be ₹P, then shares of the partners in the profits are

$$₹\left(\frac{C_1 \times P}{C_1 + C_2}\right) \text{ and } ₹\left(\frac{C_2 \times P}{C_1 + C_2}\right)$$

(*b*) If the capitals of three partners be ₹C_1, ₹C_2 and ₹C_3 for the same period and the total profit be ₹P, then shares of the partners in the profits are

$$₹\left(\frac{C_1 \times P}{C_1 + C_2 + C_3}\right), ₹\left(\frac{C_2 \times P}{C_1 + C_2 + C_3}\right)$$

and $$₹\left(\frac{C_3 \times P}{C_1 + C_2 + C_3}\right).$$

Illustration 1 *A*, *B* and *C* invested ₹20000, ₹50000 and ₹40000, respectively, in a business. The net profit for the year was ₹12100 which was divided in proportion to investments. Find the amount of profit each partner earned.

Solution: We have, $C_1 = 20000$, $C_2 = 50000$, $C_3 = 40000$ and $P = 12100$.

Therefore, profit share of *A*

$$= \frac{C_1 \times P}{C_1 + C_2 + C_3}$$

$$= \frac{20000 \times 12100}{20000 + 50000 + 40000}$$

$$= \frac{2}{11} \times 12100 = ₹2200$$

Profit share of *B*

$$= \frac{C_2 \times P}{C_1 + C_2 + C_3}$$

$$= \frac{50000 \times 12100}{20000 + 50000 + 40000}$$

$$= \frac{5}{11} \times 12100 = ₹5500$$

and, profit share of *C*

$$= \frac{C_3 \times P}{C_1 + C_2 + C_3}$$

$$= \frac{40000 \times 12100}{20000 + 50000 + 40000} = \frac{4}{11} \times 12100 = ₹4400$$

2. (*a*) If the capitals of two partners be ₹C_1 and ₹C_2 for the periods t_1 and t_2, respectively, and the total profit be ₹P, then shares of the partners in the profits are:

$$₹\left(\frac{C_1 \times t_1 \times P}{C_1t_1 + C_2t_2}\right) \text{ and } ₹\left(\frac{C_2 \times t_2 \times P}{C_1t_1 + C_2t_2}\right)$$

(*b*) If the capitals of three partners be ₹C_1, ₹C_2 and ₹C_3 for the periods t_1, t_2 and t_3, respectively, and the total profit be ₹P, then shares of the partners in the profits are

$$₹\left(\frac{C_1 \times t_1 \times P}{C_1t_1 + C_2t_2 + C_3t_3}\right), ₹\left(\frac{C_2 \times t_2 \times P}{C_1t_1 + C_2t_2 + C_3t_3}\right)$$

$$\text{and, } ₹\left(\frac{C_3 \times t_3 \times P}{C_1t_1 + C_2t_2 + C_3t_3}\right)$$

Illustration 2 A, B are two partners in a business. A contributes ₹1200 for 5 months and B ₹750 for 4 months. If total profit is ₹450, find their respective shares.

Solution: We have $C_1 = 1200$, $C_2 = 750$, $t_1 = 5$, $t_2 = 4$ and $P = 450$

$\therefore$ Profit share of A

$$= \frac{C_1 \times t_1 \times P}{C_1t_1 + C_2t_2} = \frac{1200 \times 5 \times 450}{1200 \times 5 + 750 \times 4}$$

$$= \frac{2700000}{9000} = ₹\,300$$

and profit share of B

$$= \frac{C_2 \times t_2 \times P}{C_1t_1 + C_2t_2}$$

$$= \frac{750 \times 4 \times 450}{1200 \times 5 + 750 \times 4}$$

$$= \frac{1350000}{9000} = ₹150$$

Some Useful Short-cut Methods

1. (*a*) If the capitals of two partners be ₹C_1 and ₹C_2 for the periods t_1 and t_2 respectively, then

$$\frac{\text{Profit of } A}{\text{Profit of } B} = \frac{C_1 \times t_1}{C_2 \times t_2}.$$

(*b*) If the capitals of three partners be ₹C_1, ₹C_2 and ₹C_3 for the periods t_1, t_2 and t_3 respectively, then profit of A:profit of B:profit of $C = C_1 \times t_1 : C_2 \times t_2 : C_3 \times t_3$.

Note:

If there is a loss in the business, then

Loss of A:Loss of B:Loss of C

$$= C_1 \times t_1 : C_2 \times t_2 : C_3 \times t_3.$$

Illustration 3 There are three partners A, B and C in a certain business. A puts in ₹2000 for 5 months, B ₹1200 for 6 months and C ₹2500 for 3 months. Find the ratio of their shares in the profit.

Solution: Here $C_1 \times t_1 = 2000 \times 5 = 10000$, $C_2 \times t_2 = 1200 \times 6 = 7200$ and $C_3 \times t_3 = 2500 \times 3 = 7500$

$\therefore$ Profit of A:Profit of B:Profit of C

$$= C_1 \times t_1 : C_2 \times t_2 : C_3 \times t_3$$

$$= 10000:7200:7500 \text{ or, } 100:72:75$$

2. If the capitals of three partners are invested in the ratio $C_1:C_2:C_3$ and their profits are in the ratio $P_1:P_2:P_3$, then the ratio of timing of their investments $= \frac{P_1}{C_1} : \frac{P_2}{C_2} : \frac{P_3}{C_3}$.

Illustration 4 Anu, Manu and Tanu invested capitals in the ratio 4:6:9. At the end of the business term, they received the profits in the ratio 2:3:5. Find the ratio of time for which they invested their capitals.

Solution: We have, $C_1:C_2:C_3 = 4:6:9$

and, $P_1:P_2:P_3 = 2:3:5$

Therefore, the ratio of time for which Anu, Manu and Tanu invested their capitals

$$= \frac{P_1}{C_1} : \frac{P_2}{C_2} : \frac{P_3}{C_3} = \frac{2}{4} : \frac{3}{6} : \frac{5}{9}$$

or, $$\frac{1}{2} : \frac{1}{2} : \frac{5}{9}$$

or, $$9:9:10$$

3. Three partners invested their capitals in a business. If the timing of their investments is in the ratio $t_1:t_2:t_3$ and their profits are in the ratio $P_1:P_2:P_3$, then the ratio of their capitals invested is $\frac{P_1}{t_1}:\frac{P_2}{t_2}:\frac{P_3}{t_3}$.

Illustration 5 Gupta, Singhal and Kansal start a business. If the ratio of their periods of investments are 1:2:5 and their profits are in the ratio of 3:4:5, find the ratio of capitals of Gupta, Singhal and Kansal.

Solution: We have, $P_1:P_2:P_3 = 3:4:5$

and, $t_1:t_2:t_3 = 1:2:5$

$\therefore$ Required ratio $= \frac{P_1}{t_1}:\frac{P_2}{t_2}:\frac{P_3}{t_3}$

$= \frac{3}{1}:\frac{4}{2}:\frac{5}{5}$ or, 3:2:1

Thus, Gupta, Singhal and Kansal invested their capitals in the ratio 3:2:1.

Practice Exercises

Difficulty Level-1 (Based on Memory)

1. A, B, C subscribe ₹50000 for business. A subscribes 4000 more than B and B ₹5000 more than C. Out of total profit of ₹35000 A receives:
(a) ₹11900 (b) ₹8400
(c) 14700 (d) 13600
[Based on MAT, 2005]

2. Rahul started a business with a capital of ₹8,000. After six months, Sanjay joined him with an investment of some capital. If at the end of the year each of them gets equal amount as profit, how much did Sanjay invest in the business?
(a) ₹17,500 (b) ₹18,000
(c) ₹16,000 (d) ₹16,500
[Based on MAT, 2008]

3. Anu is a working partner and Bimla is a sleeping partner in a business. Anu puts in ₹5000 and Bimla puts in ₹6000. Anu receives 12.5 per cent of the profit for managing the business and the rest is divided in proportion to their capital. What does each get out of a profit of ₹880?
(a) ₹400 and ₹480 (b) ₹460 and ₹420
(c) ₹450 and ₹430 (d) ₹470 and ₹410
[Based on MAT (Sept), 2010, (Dec), 2009]

4. X and Y are partners in a business. X contributed one-third of the capital for 9 months and Y received two-fifths of the profits. For how long was Y's money used in the business?
(a) 4 months (b) 3 months
(c) 2 months (d) 5 months
[Based on MAT (Sept), 2010, (Dec) 2009]

5. X and Y entered into partnership with ₹700 and ₹600 respectively. After 3 months, X withdrew two-sevenths of his stock but after 3 months, he puts back three-fifths of what he had withdrawn. The profit at the end of the year is ₹726. How much of this should X receive?
(a) ₹336 (b) ₹366
(c) ₹633 (d) ₹663
[Based on MAT (Sept), 2009, 2008)]

6. Sita and Gita enter into a partnership, Sita contributes ₹5000 while Gita contributes ₹4000. After 1 month, Gita withdraws one-fourth part of her contribution and after 3 months from the starting, Sita puts ₹2000 more. When Gita withdraws her money Rita also joins them with ₹7000. If at the end of 1 year, there is profit of ₹1218, what will be the share of Rita in the profit?
(a) ₹844.37 (b) ₹488.47
(c) ₹588.47 (d) None of these
[Based on MAT (Feb), 2009]

7. Three partners invested capital in the ratio 2:7:9. The time period for which each of them invested was in the ratio of the reciprocals of the amount invested. Find the share of the partner who brought in the highest capital, if profit is ₹1080.
(a) ₹120 (b) ₹360
(c) ₹540 (d) ₹420
[Based on MAT (Sept), 2008]

8. A, B, C start a business. A invests three times as much as B invests and B invests two-thirds of what C invests. Then, the ratio of capitals of A, B and C is:
(a) 3:9:2 (b) 6:10:15
(c) 5:3:2 (d) 6:2:3

9. A, B, C enter into a partnership with shares in the ratio $\frac{7}{2}:\frac{4}{3}:\frac{6}{5}$. After 4 months, A increases his share by 50 per cent. If the total profit at the end of one year be ₹21,600, the B's share in the profit is:
(a) ₹2,100 (b) ₹2,400
(c) ₹3,600 (d) ₹4,000

10. Three shepherds A, B and C rented a pasture for a year. A grazed 22 sheep for 4 months, B grazed 16 sheep for 8 months and C grazed 32 sheep for 6 months. If C's share of rent is ₹600, the total rent for the year was:
(a) ₹3,550 (b) ₹2,000
(c) ₹1,275 (d) ₹675

11. ₹1950 is divided amongst three workers A, B and C such that 6 times A's share is equal to 4 time B's share which is equal to 8 times C's share. How much did A get?

(a) ₹600 (b) ₹550

(c) ₹900 (d) ₹450

[Based on MHT-CET MBA, 2010]

12. A, B and C enter into a partnership by investing ₹ 28000, ₹ 32000 and ₹ 18000. A is a working partner and gets a fourth of the profit for this services and the remaining profit is divided amongst the three in the ratio of their investments. What is the amount of profit that B gets if A gets a total of ₹ 4995?

(a) ₹1665 (b) ₹2960

(c) ₹2590 (d) Cannot be determined

[Based on MHT-CET MBA, 2010]

13. Firoz invested ₹650000 to start a business. Dhruv joined him six months later by investing ₹800000. At the end of two years from the commencement of the business, they earned a profit of ₹435000. What is Firoz's share of the profit?

(a) ₹195000 (b) ₹185000

(c) ₹240000 (d) None of these

[Based on IRMA, 2006]

14. A, B and C invested their capital in the ratio 5:6:8. At the end of the business they received the profits in the ratio 5:3:1. Find the ratio of time for which they contributed their capital.

(a) 12:9:7 (b) 25:18:8

(c) 5:6:8 (d) 8:4:1

15. Three bachelors, Amar, Akbar and Anthony rented a house for a year. Amar left after 4 months, Akbar stayed for 8 months and only Anthony stayed for the entire year. If the annual rent was ₹6,000, find the share of Akbar.

(a) ₹4,000 (b) ₹2,000

(c) ₹300 (d) ₹2,500

16. A and B enter into partnership, investing ₹12,000 and ₹16,000, respectively. After 8 months, C joins them with a capital of ₹15,000. The share of C in a profit of ₹45,600 after 2 years will be:

(a) ₹21,200 (b) ₹19,200

(c) ₹14,400 (d) ₹12,000

17. A, B and C enter into a partnership. A contributes ₹320 for 4 months, B contributes ₹510 for 3 months and C contributes ₹270 for 5 months. If the total profit is ₹208, find the profit share of A, B and C.

(a) ₹64, ₹76.5 and ₹67.5 (b) ₹46, ₹76.5 and ₹67

(c) ₹40, ₹50 and ₹65 (d) ₹62, ₹72 and ₹82

[Based on MAT, 2011]

18. Two partners invested ₹1250 and ₹850 respectively in a business. Both the partners shared 60% of the profit and distributed the rest 40% as the interest on their capitals. If one partner received ₹30 more than the other, then the total profit is:

(a) ₹262.50 (b) ₹622.50

(c) ₹220.50 (d) ₹226.50

[Based on MAT, 2011]

19. A, B and C invested capitals in the ratio 7:3:2. At the end of the business term, they received the profits in the ratio 2:3:7. Find the ratio of time for which they contributed their capitals.

(a) 4:14:49 (b) 49:14:41

(c) 14:41:59 (d) 49:41:4

[Based on MAT, 2011]

20. Three partners invested capital in the ratio 2:7:9. The time period for which each of them invested was in the ratio of the reciprocals of the amount invested. Find the share of the partner who brought in the highest capital, if the profit is ₹1080.

(a) ₹120 (b) ₹360

(c) ₹540 (d) ₹420

[Based on MAT, 2011]

21. Arvind began a business with ₹550 and was joined afterwards by Brij with ₹330. When did Brij join, if the profits at the end of the year were divided in the ratio 10:3?

(a) After 4 months (b) After 6 months

(c) After 4.5 months (d) None of these

[Based on MAT, 2012]

22. Three partners A, B and C agree to divide the profits or losses in the ratio 1.50:1.75:2.25. If in a particular year, they earn a profit of ₹66000, find the share of B.

(1) ₹21000 (2) ₹27000

(3) ₹18000 (4) ₹22000

[Based on MAT, 2012]

23. A, B and C are partners. A receives 9/10 of the profit and B and C share the remaining profit equally. A's income is increased by ₹270 when the profit rises from 12% to 15% Find the capital invested by B and C each:

(a) ₹5000 (b) ₹1000

(c) ₹500 (d) ₹1500

[Based on MAT, 2012]

24. In a business, A and C invested capitals in the ratio 2:1, whereas the ratio between amounts invested by A and B was 3:2. If ₹157300 was their profit, how much amount did B receive?

(a) ₹24200 (b) ₹36300

(c) ₹48400 (d) ₹72600

[Based on MAT, 2014]

25. ₹5783 is divided among Ramesh, Shiv and Bhuwan in such a way that if ₹28, ₹37, and ₹18 be deducted from their respective shares, they have money in the ratio 4:6:9. Find Ramesh's share.

(*a*) ₹1256 (*b*) ₹1084
(*c*) ₹1456 (*d*) ₹1228

[Based on MAT, 2014]

26. Rahul started a business with a capital of ₹8,000. After six months, Sanjay joined him with investment of some capital. If at the end of the year each of them gets equal amount as profit, how much did Sanjay invest in the business?

(*a*) ₹17,500 (*b*) ₹18,000
(*c*) ₹16,000 (*d*) ₹16,500

[Based on SNAP, 2012]

Difficulty Level-2 (Based on Memory)

1. *A* and *B* enter into a partnership with ₹50,000 and ₹60,000, respectively. *C* joins them after *x* months contributing ₹70,000 and *B* leaves *x* months before the end of the year. If they share the profit in the ratio of 20:18:21, then find the value of *x*.

(*a*) 9 (*b*) 3
(*c*) 6 (*d*) 8

[Based on IIT Joint Man. Ent. Test, 2004]

2. ₹120 are divided among *X*, *Y* and *Z* so that *X*'s share is ₹20 more than *Y*'s share and ₹20 less than *Z*'s share. What is *Y*'s share?

(*a*) ₹40 (*b*) ₹30
(*c*) ₹25 (*d*) ₹20

[Based on IIFT, 2003]

3. Surendra, Rajendra and Manindra invested some amount in a business in the ratio of 5:7:6, respectively. In the next year, they increased their investments by 26 per cent, 20 per cent and 15 per cent respectively. The profit earned during the second year should be distributed in what ratio among Surendra, Rajendra and Manindra.

(*a*) 31:27:21 (*b*) 21:28:23
(*c*) 26:20:15 (*d*) Cannot be determined

[Based on IRMA, 2002]

4. *X* and *Y* start a business. *X* invests ₹3000 for 4 months and *Y* invests ₹2000 for 6 months. How much should *X* be paid out of a total profit of ₹500?

(*a*) ₹200 (*b*) ₹300
(*c*) ₹250 (*d*) ₹350

[Based on FMS (Delhi), 2002]

5. *A* and *B* started a business together, but they both were working on different units. The ratio of investment of *A* and *B* is 7:5. If *A* has a loss which is 3 times the profit of *B* and they get total ₹6,000 amount (net profit) back, then how much money does both *A* and *B* invest if sum of investment of *B* and 5 times his profit is 9,500?

(*a*) ₹8,400 (*b*) ₹7,400
(*c*) ₹9,600 (*d*) None of these

6. ₹300 is divided among *A*, *B* and C. The ratio of *A*'s share to the sum of *B* and *C*'s share equals ratio of *B*'s share to the sum of *A* and *C*'s share and also equals the ratio of *C*'s share to the sum of *A* and *B*'s share. Then, *A*, *B* and *C*'s share, respectively, is:

(*a*) 150, 100, 150 (*b*) 100, 150, 50
(*c*) 100, 100, 100, (*d*) 150, 50, 100

7. *A* and *B* enter into a partnership. *A* puts in the whole capital of ₹45,000 on the condition that the profits will be equally divided after which *B* will pay *A* interest on half the capital at 10 per cent p.a. and receive ₹60 per month from *A* for carrying on the concern. What is the yearly profit, if *B*'s income is half of *A*'s income?

(*a*) ₹8,190 (*b*) ₹9,180
(*c*) ₹3,600 (*d*) ₹6,900

8. *A* started a business with a capital of ₹2,100. After 4 months he admitted another partner *B*. What amount should *B* put in so that the profit may be divided equally at the end of the year?

(*a*) ₹3,000 (*b*) ₹4,120
(*c*) ₹3,150 (*d*) ₹3,600

9. *A*, *B* and *C* enter into partnership in a business with capitals of ₹5,000, ₹6,000 and ₹4,000 respectively. *A* gets 30 per cent of the profit for managing the business and balance is divided in proportion to their capitals. At the end of the year, *A* gets ₹200 more than *B* and *C* together. Find the total profit.

(*a*) ₹3,600 (*b*) ₹3,000
(*c*) ₹2,875 (*d*) ₹2,550

10. *A* and *B* enter into partnership. *A* supplies whole of the capital amounting to ₹45,000 with the condition that the profit are to be equally divided and that *B* pays the interest on half the capital to *A* at 10 per cent per annum, but receives ₹120 per month for carrying on the concern. Find their total yearly profit when *B*'s income is one half of *A*'s income.

(*a*) ₹9,215 (*b*) ₹9,000
(*c*) ₹9,227.5 (*d*) ₹9,180

11. *A*, *B* and *C* enter into partnership. *A* invests some money at the beginning, *B* invests double the amount after 6 months and *C* invests thrice the amount after 8 months. If the annual profit be ₹27000, *C*'s share is:

(*a*) ₹9000 (*b*) ₹11250
(*c*) ₹10800 (*d*) ₹8625

[Based on FMS (MS), 2006]

12. John, Mona and Gordon, three US based business partners, jointly invested in a business project to supply nuclear fuel to India. As per their share in the investment, Gordon will receive 2/3 of the profits whereas John and Mona divide the remainder equally. It is estimated that the income of John will increase by $60 million when the rate of profit rises from 4 per cent to 7 per cent. What is the capital of Mona?

(*a*) $ 2000 million (*b*) $ 3000 million
(*c*) $ 5000 million (*d*) $ 8000 million

[Based on FMS, 2009]

13. Amber Chew opened a departmental store at Great India Palace in Noida by investing ₹20 million. After a few months her brother Sheesh Chew joined the business and invested ₹30 million. At the end of the year, the profit was shared in the ratio of 3:2. After how many months did Amber's brother join the business?

(*a*) 4 months (*b*) 6 months
(*c*) 7 months (*d*) 8 months

[Based on FMS, 2009]

14. *A* and *B* invest ₹60,000 and ₹80,000 in a business. *A* receives ₹100 per month out of profit for running the business and the rest of the profit is divided in the ratio of investments. If *A* receives ₹3,900 annually, *B* receives:

(*a*) ₹3,200 (*b*) ₹2,700
(*c*) ₹3,600 (*d*) ₹2,925

15. Sumant started a business investing ₹48000. After 6 months Maurya joined him with a captial ₹56000. At the end of the year the total profit was ₹24529. What is the difference between the share of profits of Sumant and Maurya?

(*a*) ₹6455 (*b*) ₹7775
(*c*) ₹5545 (*d*) ₹4875

[Based on NMAT, 2008]

16. Ram and Shyam form a partnership (with Shyam as working partner) and start a business by investing ₹4,000 and ₹6,000, respectively. The conditions of partnership are as follows:

- In case of profits till ₹200,000 per annum, profit would be shared in ratio of the invested capital.
- Profits from ₹200,001 till ₹. 400,000, Shyam would take 20% out of the profit, before the division of remaining profits, which will then be based on ratio of invested capital.
- Profits in excess of ₹400,000 Shyam would take 35% out of the profits beyond ₹400,000, before the division of remaining profits, which will then be based on ratio of invested capital.

If Shyam's share in a particular year was ₹367,000, which option indicates the total business profit (in ₹) for that year?

(*a*) 520,000 (*b*) 530,000
(*c*) 540,000 (*d*) 550,000

[Based on XAT, 2012]

17. *A*, *B* and *C* enter into a partnership by making investments in the ratio 3:5:7. After a year, *C* invests another ₹3,37,600 while A withdraws ₹45,600. The ratio of investments then changes to 24:59:167. How much did A invest initially?

(*a*) ₹45,600 (*b*) ₹96,000
(*c*) ₹1,41,600 (*d*) None of these

18. Eight people enter into a partnership; 6 of them bring in ₹30 each. The seventh person brings in ₹10 more than the average of eight persons, and the eighth person brings in ₹55. What is the total sum brought in?

(*a*) ₹40 (*b*) ₹240
(*c*) ₹280 (*d*) ₹250

Answer Keys

Difficulty Level-1

1. (*c*) **2.** (*c*) **3.** (*b*) **4.** (*b*) **5.** (*b*) **6.** (*b*) **7.** (*b*) **8.** (*d*) **9.** (*d*) **10.** (*c*) **11.** (*a*) **12.** (*b*) **13.** (*d*)
14. (*d*) **15.** (*b*) **16.** (*d*) **17.** (*a*) **18.** (*a*) **19.** (*a*) **20.** (*b*) **21.** (*b*) **22.** (*a*) **23.** (*c*) **24.** (*c*) **25.** (*d*) **26.** (*c*)

Difficulty Level-2

1. (*b*) **2.** (*d*) **3.** (*b*) **4.** (*c*) **5.** (*a*) **6.** (*c*) **7.** (*b*) **8.** (*c*) **9.** (*b*) **10.** (*d*) **11.** (*a*) **12.** (*a*) **13.** (*b*)
14. (*c*) **15.** (*a*) **16.** (*d*) **17.** (*c*) **18.** (*c*)

Explanatory Answers

Difficulty Level-1

1. (*c*) Let $C = x$

$B = x + 5000,$

$A = x + 5000 + 4000$

$\therefore\ x + x + 5000 + x + 9000$

$= 50000$

$\therefore\ x = 12000$

$\therefore\ A:B:C = 21000:17000:12000$

$= 21:17:12$

A's share $= 35000 \times \frac{21}{50} = ₹14700.$

2. (*c*) $\frac{8000 \times 12}{x \times 6} = \frac{1}{2} \Rightarrow x = 16000.$

3. (*b*) 12.5% of profit $= \frac{12.5}{100} \times 880 = ₹110$

Remaining ₹770 is divided in the ratio

$= 5000:6000 = 5:6$

Profit of Anu $= \frac{5}{11} \times 770 + 110 = ₹460$

Profit of Bimla $= \frac{6}{11} \times 770 = ₹420.$

4. (*b*) Ratio of capital $= \frac{1}{3}:\frac{2}{3} = 1:2$

Ratio of profit $= \frac{3}{5}:\frac{2}{5} = 3:2$

Let *Y*'s money was used for *n* months.

$\therefore\ (1 \times 9):(2 \times n) = 3:2$

$\Rightarrow\ n = 3$ months.

5. (*b*) *X*'s investment

$$= (700 \times 3) + \left(700 \times \frac{5}{7} \times 3\right) + \left(500 + 200 \times \frac{3}{5}\right) \times 6$$

$= ₹7320$

Y's investment $= 600 \times 12 = ₹7200.$

$\therefore$ *X*'s share from profit

$$= \frac{7320}{(7320 + 7200)} \times 726 = ₹366.$$

6. (*b*) Ratio of investment of Sita, Gita and Rita is $(5000 \times 3 + 7000 \times 9):(4000 \times 1 + 3000 \times 11):(7000 \times 11)$

$= 78000:37000:77000$

$= 78:37:77$

$\therefore$ Share of Rita in profit

$$= \frac{77}{78 + 37 + 77} \times 1218$$

$\approx ₹488.47.$

7. (*b*) Ratio of capital = 2:7:9

Ratio of time $= \frac{1}{2}:\frac{1}{7}:\frac{1}{9}$

$\therefore$ Ratio of investment

$$= 2 \times \frac{1}{2}:7 \times \frac{1}{7}:9 \times \frac{1}{9} = 1:1:1$$

$\therefore$ Share of each partner

$$= \frac{1}{3} \times 1080 = ₹360.$$

8. (*d*) Let C invests ₹*x*, then ratio of investments of *A*, *B* and *C*.

$$= 2x:\frac{2x}{3}:x = 6:2:3.$$

9. (*d*) Ratio of investments of *A*, *B* and *C*

$$= \left(\frac{7}{2} \times 4 + \frac{105}{2} \times 8\right):\frac{4 \times 12}{3}:\frac{6 \times 12}{5}$$

$\Rightarrow$ 56:16:14.4. Therefore, *B*' share

$$= \frac{16}{86.4} \times 21600 = ₹4{,}000.$$

10. (*c*) *A*'s Monthly Equivalent Rent $= 22 \times 4$

B's Monthly Equivalent Rent $= 16 \times 8$

C's Monthly Equivalent Rent $= 32 \times 6$

$$\frac{B\text{'s Monthly Equivalent Rent}}{C\text{'s Monthly Equivalent Rent}} = \frac{\text{Rent paid by } B}{\text{Rent paid by } C}$$

$$\therefore\ \frac{16 \times 8}{32 \times 6} = \frac{\text{Rent paid by } B}{600}$$

$$\therefore\ \text{Rent paid by } B = \frac{16 \times 8 \times 600}{32 \times 6} = ₹400$$

Similarly, rent paid by

$$A = \frac{22 \times 4 \times 60}{32 \times 6} = ₹275$$

$\therefore$ Total rent $= 400 + 600 + 275 = ₹1{,}275.$

11. (*a*) Let, $A \times 6 = B \times 4 = C \times 8 = \lambda$

So, $A = \frac{\lambda}{6}, B = \frac{\lambda}{4}, C = \frac{\lambda}{8}$

Amount ratio among them

$$= \frac{\lambda}{6}:\frac{\lambda}{4}:\frac{\lambda}{8}$$

$= 4:6:3$

Hence, A's share $= \dfrac{4}{(4+6+3)} \times ₹1950$

$= \dfrac{4}{13} \times ₹1950$

$= ₹600.$

12. (b) Investment ratio among A, B and C

$= 28000:32000:18000$

$= 14:16:9$

Suppose total profit $= ₹x$

A's profit for his services $= ₹x \times \dfrac{1}{4} = ₹-$

Remaining profit $= x - \dfrac{x}{4} = ₹\dfrac{3x}{4}$

A's profit according to his investment

$= ₹\dfrac{3x}{4} \times \dfrac{14}{(14+16+9)}$

$= ₹\dfrac{3x}{4} \times \dfrac{14}{39}$

$\Rightarrow \quad = ₹\dfrac{7x}{26}$

Then, $\left(\dfrac{x}{4} + \dfrac{7x}{26}\right) = ₹4995$

$\Rightarrow \quad \dfrac{13x + 14x}{52} = ₹4995$

$\Rightarrow \quad x = 52 \times \dfrac{4995}{27} = ₹9620$

Hence, B's profit $= ₹\dfrac{3x}{4} \times \dfrac{16}{39}$

$= ₹\dfrac{3 \times 9620}{4} \times \dfrac{16}{39} = ₹2960.$

13. (d)

Firoz		Dhruv
650000×24	:	800000×18
13	:	12

$\therefore$ Share of Firoz $= \dfrac{13}{25} \times 435000$

$= ₹226200.$

14. (d) Let they invest money for x, y and z months

then $5x:6y:8z = 5:3:1$

or, $\quad x:y:z = 1:\dfrac{1}{2}:\dfrac{1}{8} = 8:4:1.$

15. (b) Rate in which the rent is to be divided $= 4:8:12$

$\therefore$ Akbar's share of rent $= \dfrac{8}{24} \times 6000 = ₹2{,}000.$

16. (d) Ratio of investments of A, B and C

$= 12000 \times 24:16000 \times 24:15000 \times 16$

$= 18:24:15$

So share of $C = \dfrac{15}{57} \times 45600 = ₹12{,}000.$

17. (a) Ratio of the profits of A, B and C

= Ratio of their partnership

$= 320 \times 4:510 \times 3:270 \times 5$

$= 128:153:135$

Let the profits of A, B and C be $128x$, $153x$ and $135x$ respectively.

Then, $128x + 153x + 135 = 208$

$\Rightarrow \quad 416x = 208$

$\Rightarrow \quad x = \dfrac{1}{2}$

Hence, share of $A = 128 \times \dfrac{1}{2} = ₹64$

Share of $B = 153\dfrac{1}{2} = ₹76.5$

Share of $C = 135 \times \dfrac{1}{2} = ₹67.5.$

18. (a) Ratio of the profit $= 1250:850 = 25:17$

They shared 60% of the profit.

If the total profit is x, then

60% of $x \times \dfrac{25-17}{25+27} = 30$

$\Rightarrow \quad \dfrac{6x}{10} \times \dfrac{8}{42} = 30 \quad \Rightarrow \quad x = ₹262.50.$

19. (a) Ratio of capitals of A, B and $C = 7:3:2$

Ratio of profits of A, B and $C = 2:3:7$

$\therefore$ Ratio of time $= \dfrac{2}{7}:\dfrac{3}{3}:\dfrac{7}{2} = \dfrac{2}{7}:1:\dfrac{7}{2} = 4:14:49.$

20. (b) Ratio of capitals $= 2:7:9$

Ratio of time period $= \dfrac{1}{2}:\dfrac{1}{7}:\dfrac{1}{9}$

$\therefore$ Ratio of profit $= 2 \times \dfrac{1}{2}:7 \times \dfrac{1}{7}:9 \times \dfrac{1}{9} = 1:1:1$

Hence, profit of all the three partners is same and equal to $\dfrac{1080}{3} = ₹360.$

21. (b) Let Brij joined after x months. Then,

$550 \times 12 : 330 \times (12-x) = 10:3$

$$\frac{5 \times 12}{3 \times (12-x)} = \frac{10}{3}$$

$\Rightarrow \quad \dfrac{6}{12-x} = 1 \quad \Rightarrow \quad 6 = 12 - x$

$\Rightarrow \quad x = 12 - 6 = 6$

Hence, Brij joined after 6 months.

22. (a) Share of $B = \dfrac{1.75}{1.50 + 1.75 + 2.25} \times 66000$

$= \dfrac{1.75}{5.5} \times 66000 = ₹21000.$

23. (*c*) Ratio of investment of A, B and C = Ratio of profit of A, B and C

$$= \frac{9}{10} : \frac{1}{20} : \frac{1}{20} = 18:1:1$$

Also, given that A's income is increased by ₹270, when the profits rises 3% (from 12% to 15%)

$\therefore$ Investment of A $\frac{270}{3} \times 100 = ₹9000$

If investment of A, B and C, $18x$, x and x, then

$$18x = 9000$$
$$x = ₹500$$

Hence, the capital invested by B and C each is ₹500.

24. (*c*) Given, $A:B = 3:2$ and $A:C = 2:1$

$\therefore A:B:C = 6:4:3$

Total profit = ₹157300

$\therefore B$'s share $= \frac{4}{13} \times 157300 = ₹48400.$

25. (*d*) Let the share of Ramesh, Shiv and Bhuwan be ₹$4x$, ₹$6x$ and ₹$9x$ after the reducation of money.

We are given

Ramesh's actual share = ₹ $(4x + 28)$

Shiv's actual share = ₹ $(6x + 37)$

Bhuwan's actual share = ₹ $(9x + 18)$

And their sum = ₹5783

$\therefore \quad 4x + 28 + 6x + 37 + 9x + 18 = 5783$

$\Rightarrow \quad 4x + 6x + 9x + 28 + 37 + 18 = 5738$

$\Rightarrow \quad 19x + 83 = 5738 \quad \Rightarrow \quad 19x = 5700$

$\therefore \quad x = \frac{5700}{19} = 300$

$\therefore$ Ramesh share $= 4x + 28$

$= 4 \times 300 + 28 \quad \Rightarrow \quad ₹1228$

$\therefore \quad SI = \frac{P \times R \times T}{100}$

$\Rightarrow \quad 10000 = \frac{10000 \times 8}{100} \times \frac{25}{2} \quad \Rightarrow \quad 10000 = 10000$

Hence, only Statement I alone is sufficient to answer the question.

26. (*c*) Rahul stated a business with a capital of ₹8000.

Let Sanjay invests ₹x

Since, each of them gets equal amount as profit

$\therefore$ Profit is divided in the ratio 1:1

Since, Sanjay joined Rahul after 6 months.

$\therefore$ We have

$8000 \times 12 : x \times (12 - 6) = 1:1$

$\Rightarrow \quad \frac{8000 \times 12}{6x} = \frac{1}{1}$

$\Rightarrow \quad 8000 \times 12 = 6x$

$\Rightarrow \quad 16{,}000 = x$

Hence, Sanjay invests ₹16,000 in the business.

DIFFICULTY LEVEL-2

1. (*b*) Let B leaves x months before the end of the year.

$\therefore$ B stays for $(12 - x)$ months.

C joins after x months.

$\therefore$ C also remains for $(12 - x)$ months.

$\therefore$ Profits are shared among A, B and C in the ratio.

$$50000 \times 12 : 60000\,(12 - x) : 70000\,(12 - x)$$
$$= 20:18:21 \text{ (Given)}$$

$\therefore \quad \frac{60}{6(12 - x)} = \frac{20}{18} \Rightarrow x = 3.$

2. (*d*) $X + Y + Z = 120$

$$X = Y + 20, X = Z - 20$$

$\Rightarrow \quad (Y + 20) + Y + (X + 20) = 120$

$\Rightarrow \quad X + 2Y = 80$

$\Rightarrow \quad (Y + 20) + 2Y = 80$

$\Rightarrow \quad 3Y = 60$

$\Rightarrow \quad Y = 20.$

3. (*b*) $5K + 26\%$ of $5K : 7K + 20\%$ of $7K : 6K + 15\%$ of $6K$

$\Rightarrow \quad \frac{630}{100}K : \frac{840}{100}K : \frac{690}{100}K$

$\Rightarrow \quad 63:84:69 \quad \Rightarrow \quad 21:28:23.$

4. (*c*) The ratio in which X and Y should be paid the profit out of ₹500.

$= 3000 \times 4 : 2000 \times 6 = 12:12 = 1:1$

$\therefore$ Each of X and Y should be paid ₹250.

5. (*a*) Let $7x$ and $5x$ be the investments of A and B, respectively.

Let $3y$ and y be the loss of A and profit of B, respectively, then, $7x - 3y + 5x + y = 6000$

$\Rightarrow \quad 6x - y = 3000 \qquad (1)$

and $\quad 5x + 5y = 9500$

$\Rightarrow \quad x + y = 1900 \qquad (2)$

$(1) + (2) \Rightarrow x = 700$

Hence, total money invested = $7x + 5x$ = ₹8,400.

6. (*c*) ₹300 is to be divided among *A*, *B* and *C*

Let *A* be *A*'s share, *B* be *B*'s share and *C* be *C*'s share

$$\therefore \quad \frac{A}{B+C} = \frac{B}{A+C} = \frac{C}{A+B}$$

$$= \frac{A+B+C}{2(A+B+C)} = \frac{1}{2}$$

$$\therefore \quad A = B = C = ₹100.$$

7. (*b*) Interest on ₹22,500 = $0.1 \times 22{,}500$ = ₹2,250

Charges for managing the concern = 60×12

= ₹4,720

If yearly profit is ₹*x*, then *B*'s share and *A*'s share = $\frac{x}{2}$

$$\therefore \quad \frac{x}{2} - 2250 + 720 = \frac{1}{2}\left(\frac{x}{2} - 720 + 2250\right)$$

$$\therefore \quad x = ₹9{,}180.$$

8. (*c*) Initial Capital = ₹2,100. *A*'s capital continues for 12 months.

B's capital continues (12 – 4) = 8 months. Let, *B* puts in ₹*x*

$$\Rightarrow 2100 \times 12 = x \times 8$$

$$\Rightarrow x = 2100 \times 12/8 = ₹3{,}150.$$

9. (*b*) Let the total profit be ₹*x*

Amount of profit = $₹\left(x - \frac{3x}{10}\right) = ₹\left(\frac{7x}{10}\right)$

Ratio of capitals = 5000:6000:4000 or, 5:6:4

$$\therefore \quad A\text{'s share} = ₹\left[\left(\frac{7x}{10} \times \frac{5}{15}\right) + \frac{3x}{10}\right] = ₹\left(\frac{8x}{15}\right)$$

$$B\text{'s share} = ₹\left(\frac{7x}{10} \times \frac{6}{15}\right) = ₹\left(\frac{7x}{25}\right)$$

$$C\text{'s share} = ₹\left(\frac{7x}{10} \times \frac{4}{15}\right) = ₹\left(\frac{14x}{75}\right)$$

$$\therefore \quad \frac{7x}{25} + \frac{14x}{75} + 200 = \frac{8x}{15} \text{ or } x = 3000$$

Thus, the total profit is ₹3,000.

10. (*d*) Let the yearly total profit be ₹*x*

Amount paid to *B* as salary = ₹(120 × 12) = ₹1,440

Share of each = $₹\left(\frac{x - 1440}{2}\right)$

Interest paid by *B* = $₹\left(\frac{22500 \times 10}{100}\right)$ = ₹2,250

Total money received by *A*

$$= ₹\left(\frac{x-1440}{2} + 2250\right) = ₹\left(\frac{x+3060}{2}\right)$$

Total money recevied by *B*

$$= ₹\left[\left(\frac{x-1440}{2}\right) + 1440 - 2250\right] = ₹\left(\frac{x-3060}{2}\right)$$

Given: $\frac{1}{2}\left(\frac{x+3060}{2}\right) = \left(\frac{x-3060}{2}\right)$

or, $\frac{x+3060}{4} = \frac{x-3060}{2} = x$

or, $x = 9180$

Hence, the total profit = ₹9,180.

11. (*a*)

A		*B*		*C*
$x \times 12$	:	$2x \times 6$	:	$3x \times 4$
$\Rightarrow 12x$	:	$12x$	:	$12x$

$$\therefore \quad 3x = 27000 \Rightarrow x = ₹9000.$$

12. (*a*) Ratio of the shares of investment of Gordon, John and Mona = 4:1:1 = $\frac{2}{3} : \frac{1}{6} : \frac{1}{6}$

Let the capital be *x*.

Total profit increased = $\frac{(7-4)x}{100} = \frac{3x}{100}$

$\therefore$ John's increased share = $\frac{3x}{600}$

$$\therefore \quad \frac{3x}{600} = 60 \text{ million}$$

$$\Rightarrow \quad x = 12000 \text{ million}$$

$\therefore$ Capital of Mona = $\frac{12000}{6}$ = $ 2000 million.

13. (*b*) Let *x* month be the period of investment of Sheesh Chew.

$\therefore$ Ratio of the profits of Amber Chew and Sheesh Chew = $\frac{20 \times 12}{30 \times x}$

$$\Rightarrow \quad \frac{20 \times 12}{30 \times x} = \frac{3}{2} \quad \Rightarrow \quad x = 5.33 = 6 \text{ months.}$$

14. (*c*) *A*'s profit + 1200 = 3900

$\Rightarrow$ *A*'s profit = ₹2,700

B's profit = (80000/60000) × 2,700

= (4/3) × 2,700 = ₹3,600.

15. (*a*)

Sumant	:	Maurya
12×48000	:	6×56000
12×48	:	6×56
576	:	336
12	:	7

$\therefore$ Share of profit of Sumant

$$= \frac{12}{19} \times 24529 = 12 \times 1291 = ₹15492$$

Share of profit of Maurya = 24529 – 15492 = ₹9037

Difference between the share of profit of Sumant and Maurya = 15492 – 9037 = ₹6455.

16. (*d*)

17. (*c*) Let the initial investments of A, B and C be $3x$, $5x$ and $7x$ respectively. Investment after one year.

$$= 3x - 45600,\ 5x,\ 7x + 337600$$

Given $3x - 45600 : 5x : 7x + 337600$

$$= 24 : 59 : 167$$

or x = ₹47,200, therefore, investment of $A = 3 \times 47200$ = ₹1,41,600.

18. (*c*) Six people contribute a total of ₹180. Let, the seventh person contributes ₹x

Eighth person contributes ₹55

Total contributions of these eight persons = $235 + x$

Now $$x = \frac{235 + x}{8} + 10$$

$$\Rightarrow \frac{7}{8}x = \frac{1}{8}(235) + 10 \Rightarrow x = 45$$

$\therefore$ Total collection = 235 + 45 = ₹280.