CHAPTER – 5
CASELETS

Worked out Examples:

These questions are based on the information given below.

Anurag, Anil and Anmol worked together to paint Mr. Arun's house. Arun gave an amount of ₹13,500 for the work. It was decided among themselves that Anurag should get one third more than Anil and Anmol should get $8/15^{th}$ of the total amount.

Solution:

Let the amounts received by Anurag, Anil and Anmol for their respective works be x, y and z.
Given that x + y + z = ₹13,500 ------- (1)

$x = \left(1+\frac{1}{3}\right)y$

$\Rightarrow x = \frac{4}{3}y$ -------- (2)

$z = \frac{8}{15}$ (₹13,500) = ₹7,200 -------- (3)

(1) $\Rightarrow$ x + y = ₹13,500 – ₹7,200
$\Rightarrow$ x + y = ₹6,300

From (2) $\frac{4}{3}4 + y = ₹6,300 \Rightarrow \frac{7y}{3} = ₹6,300$

$\Rightarrow$ y = ₹2,700
$\Rightarrow$ x = 6,300 – ₹2,700 = ₹3,600

5.01: What is the amount received by Anmol and Anil together?
(A) ₹9,300 (B) ₹9,600
(C) ₹9,900 (D) ₹10,200

Sol: Amount received by Anmol and Anil together
= y + z = ₹2,700 + ₹7,200 = ₹9,900
Choice (C)

5.02: What is the difference between the amounts received by Anurag and Anil?
(A) ₹900 (B) ₹1,000
(C) ₹1,100 (D) ₹1,200

Sol: The difference between the amounts received by Anurag and Anil = x – y
= ₹3,600 – ₹2,700 = ₹900 Choice (A)

5.03: What is the ratio of the amounts received by Anurag and Anmol together to the amount received by Anil?
(A) 3 : 2 (B) 4 : 1
(C) 2 : 3 (D) 1 : 4

Sol: The ratio of the amounts received by Anurag and Anmol together to the amount obtained by Anil = (x + z) : y = (₹3,600 + ₹7,200) : (₹2,700)
= ₹10,800 : ₹2,700 = 4 : 1 Choice (B)

5.04: The amount received by Anurag and Anil together is what percentage of the amount received by Anmol?
(A) 67.5% (B) 75%
(C) 80% (D) 87.5%

Sol: The total amount received by Anurag and Anil together = x + y = ₹3,600 + ₹2,700 = ₹6,300
$\therefore$ The required percentage
$= \frac{₹6,300}{₹7,200} \times 100\% = 87.5\%$ Choice (D)

5.05: The difference between the amounts received by Anurag and Anil is what part of the total amount received by the three together?
(A) $6\frac{2}{3}\%$ (B) 8%
(C) $9\frac{2}{3}\%$ (D) 10%

Sol: The difference between the amounts received by Anurag and Anil = x – y
= ₹3,600 – ₹2,700 = ₹900
$\therefore$ The required part = $\frac{₹900}{₹13,500} \times 100\% = 6\frac{2}{3}\%$
Choice (A)

Exercise – 5(a)

Directions for questions 1 to 5: These questions are based on the information given below.

The information below gives the partial details of the employees in four departments – Marketing, Operations, Production and Accounts of Company XYZ Pvt. Ltd.

	Marketing	Operations	Production	Accounts	Total
Males					1600
Females			435		

We have the following additional information
(1) The ratio of males to females is 2 : 1.
(2) The difference between the number of employees in the Marketing and Production departments is 865.
(3) The ratio of the number of employees in the Marketing and Operations department is 3 : 1 and that in the Production and Accounts department is 7 : 1.
(4) The number of males in the Marketing department is 80% more than the number of employees in the Accounts department.
(5) The number of males in the Accounts department is one-third of the number of females in the Marketing department.

1. What percent of the number of employees in the Accounts department is the males in the Operations department?
(A) 40% (B) 60% (C) 80% (D) 20%

2. What is the number of males in the Production department?
(A) 1000 (B) 900 (C) 800 (D) 600

3. What is the ratio of the number of employees in the Marketing department to the number of females in the Production department?
(A) 38 : 29 (B) 38 : 28
(C) 37 : 28 (D) 57 : 43

4. In how many of the given departments is the number of males less than the number of females?
(A) 0 (B) 1 (C) 2 (D) 3

5. In which of the following departments is the percentage of males, the highest?
(A) Marketing (B) Operations
(C) Production (D) Accounts

Directions for questions 6 to 10: These questions are based on the information given below.

There are 240 students in a management institute. Each student opted for exactly one of the three specializations among Finance, HR and Marketing. The total number of students who opted for Finance and HR is equal to the number of students who opted for Marketing. 42.5% of the students who opted for Marketing are girls. The number of girls who opted for Finance is one-third of the number of boys who opted for Marketing. The difference between the number of boys who opted for HR and the number of girls who opted for Finance is equal to the difference between the number of boys who opted for Finance and the number of girls who opted for HR. The number of girls who opted for HR is 28.

Directions for questions 6 to 8: Type in your answer in the input box provided below the question.

6. What is the number of students who opted for Finance?

7. What is the total number of boys in the institute?

8. What percent of the number of students who opted for HR is the number of girls who opted for marketing?

9. What is the ratio of the number of girls who opted for Finance and HR together to the number of girls who opted for Marketing?
(A) 3 : 2 (B) 4 : 3 (C) 5 : 4 (D) 1 : 1

10. By what percent is the number of boys who opted for Marketing more than the number of students who opted for HR?
(A) 15% (B) 12.5% (C) 17.5% (D) 25%

Directions for questions 11 to 15: These questions are based on the information given below.

Kirit won a lottery amount of ₹5 lakhs in a lucky draw at a jewellery showroom. He deposited 20% of it in a bank at a compound rate of interest of 10% p.a. He invested 35% of the amount in shares and with the rest he bought a piece of land. His investment in shares appreciated by 20% in the first year and depreciated by 10% in the subsequent year while the price of the land appreciated by 10% each year. He encashed all his investments at the end of the second year.

11. What was the total value of his investments at the end of the first year?
(A) ₹5.675 lakhs (B) ₹5.75 lakhs
(C) ₹5.875 lakhs (D) ₹5.95 lakhs

12. What is the ratio of the amount he got from the bank and shares together at the end of the second year to the price of the land at the end of the first year?
(A) 2 : 1 (B) 4 : 3 (C) 5 : 4 (D) 6 : 5

13. What is the increase in the total value of his investment from the beginning of the first year to the end of the second year?
(A) ₹85,150 (B) ₹1,10,250
(C) ₹1,15,150 (D) ₹82,250

14. What is the percentage increase in the value of the investment from the beginning of the first year to the end of the first year?
(A) 13.5% (B) 17.5% (C) 19.5% (D) 21.5%

15. What is the ratio of the increase in the value of his investment from the beginning of the first year to the end of the first year to the increase in the value of his investment from the end of the first year to the end of the second year?
(A) 210 : 89 (B) 270 : 59
(C) 410 : 109 (D) 510 : 119

Directions for questions 16 to 20: These questions are based on the information given below.

Sudhir invested 30% of the amount with him in shares, 25% of the amount in NSCs, 50% of the remaining amount in FDs and the rest in land. At the end of the first year, the value of his shares increased by 20%, NSCs gave him a tax free return of 5%, FDs gave him a return of 5% but he had to pay a tax of 10% on the interest while the land prices appreciated by 15%.

In the second year, as there was a slow down in the market, the value of his shares decreased by 10% while NSCs gave him an interest free returns of 4%. FDs too gave him a return of 4% but he had to pay a tax of 20% on the interest and the land prices appreciated by 4% and became ₹8,61,120.

16. What is the value of the amount invested by him in FDs at the end of first year?
(A) ₹7,26,200
(B) ₹7,52,400
(C) ₹7,84,600
(D) ₹18,800

17. What was the total returns obtained by him from NSCs by the end of the second year?
(A) ₹73,600 (B) ₹75,800
(C) ₹77,400 (D) ₹79,200

18. In which of the schemes did he get the highest returns by the end of the first year?
(A) Shares (B) NSC
(C) FDs (D) Land

19. What is the ratio of total return in shares by the end of the second year compared to the increase in the price of land from the beginning of the first year to the end of the second year?
(A) 20 : 87 (B) 40 : 107
(C) 60 : 127 (D) 80 : 147

20. Had there been no slowdown in the market, and his investment in shares had appreciated from the end of the first year to the end of the second year by 15%, then what would be the value of his investment in shares at the end of the second year?
(A) ₹13,24,800 (B) ₹14,56,600
(C) ₹15,72,400 (D) ₹16,84,400

Exercise – 5(b)

Directions for questions 1 to 5: These questions are based on the information given below.

The University of Dunning gives students the flexibility to specialize in one or two areas out of four – Commerce, Humanities, Medicine and Science. It is known that in a batch of 300, 50 specialize in only Commerce and half of those who specialize in Commerce specialize in Humanities also. No one who specializes in Medicine specializes in Humanities where as everyone who specializes in Science also opts for a specialization in Commerce.

1. What is the maximum number of students who specialize in only Humanities, if it is known that every area has at least ten students specializing in it?
(A) 185 (B) 200 (C) 170 (D) 180

2. By how much is the maximum number of students who can specialize in Commerce more/less than the maximum number of students who can specialize in Medicine?
(A) 50 more (B) 50 less
(C) 100 more (D) 100 less

3. The ratio of the number of students who opted for both Commerce and Science or both Commerce and Medicine, to the number of students who opted for both Commerce and Humanities can be _____.
(A) 1 (B) $\frac{5}{6}$ (C) $\frac{7}{16}$ (D) $\frac{11}{5}$

4. The number of students specializing in exactly one area among Commerce, Humanities, Science or Medicine is _____.
(A) 300 (B) at least 75
(C) at least 100 (D) at least 50

5. The maximum number of students who specialize in Science is _____.
(A) 100 (B) 105 (C) 95 (D) 125

Directions for questions 6 to 10: These questions are based on the information given below.

M has some amount with him in the form of ₹500 notes. He distributed one-third of the amount with him among his five sons P, Q, R, S, T in such a way that the eldest son gets the highest amount, the second eldest son gets an amount less than that received by the eldest son and so on. The amount received by P is equal to the sum of the amounts received by T and R. The amount received by T is equal to the sum of the amounts received by Q and R. The amount received by S is equal to the sum of the amounts received by P and R. After distributing the amount among his sons, he gave three-fourth of the remaining amount with him to his wife, N. Finally now M is left with ₹3,750.

6. Who among the following is the eldest son?
(A) P (B) Q (C) T (D) S

7. What is the amount received by N?
(A) ₹7,500 (B) ₹11,250
(C) ₹15,000 (D) ₹12,500

8. What is the difference between the amounts received by the eldest son and that received by the youngest son?
(A) ₹2,500 (B) ₹2,000
(C) ₹1,500 (D) ₹1,000

9. If P gives ₹500 to Q, then how many of the given persons will have the same amount?
(A) 0 (B) 1
(C) 2 (D) 3

10. What is the ratio of the amounts with S and N?
(A) 2 : 3 (B) 2 : 9
(C) 3 : 7 (D) 4 : 9

Directions for questions 11 to 15: These questions are based on the following information.

A shopkeeper filled rice available with him in five bags, each with a different capacity. The shopkeeper wanted to weigh these five types of bags but the weighing pan with him weighs only those bags weighing above 80 kg. So he measured three bags at a time and weighed all the possible combinations of bags and obtained the measurements as 95 kg, 150 kg, 225 kg, 120 kg, 145 kg, 175 kg, 170 kg, 200 kg, 195 kg and 145 kg.

Directions for questions 11 to 15: Type in your answer in the input box provided below the question.

11. What is the weight of the lightest bag?

12. How much did the heaviest bag weigh?

13. What is the average weight of all the five bags?

14. What is the weight of the bag which weighs less then the two heaviest bags but more than the two lightest bags?

15. What is the difference between the weights of the second heaviest and the second lightest bags?

Directions for questions 16 to 20: These questions are based on the information given below.

Mr. Alex is a private employee and earns a fixed salary every month. While filing his income tax returns in a financial year, the accountant noticed the following.

Tax is always calculated on the income after deductions, if any. The deductions are as follows.

(i) The standard deduction is one-third of the annual salary.

(ii) Mr. Alex donates ₹40,000 to the PM's National Relief Fund which gives 100% exemption.

After allowing the deductions, the remaining income is taxed, which is the tax before rebate. The rate of tax on his taxable income is 20%. As he saves ₹35,000 towards CPF (Contributory Provident Fund) and ₹25,000 towards PPF (Public Provident Fund), and 20% of each can be deducted (rebate) from the tax calculated before rebate. This is the tax after rebate.

The surcharge is computed on the tax after rebate and the total amount to be paid is calculated. The surcharge is ₹5,000 which is 5% of the tax after rebate.

16. What is the monthly salary of Mr. Alex (in ₹)?
(A) 65000 (B) 70000 (C) 75000 (D) 80000

17. If the employer of Mr. Alex deducts ₹8,000 per month during the first eleven months of the financial year as taxes, then find the amount paid by him in the last month of the financial year as a percentage of his monthly income?
(A) 13.3% (B) 16.4% (C) 20.5% (D) 22.6%

18. If Mr. Alex is a senior citizen and he is eligible for an additional rebate of ₹20,000 which can be deducted from the tax before rebate, then what was the annual salary of Mr. Alex (in ₹), all other things remaining the same?
(A) 1050000 (B) 1035500
(C) 999500 (D) 998000

19. If his savings in CPF and PPF fetches 10% interest and the tax on the interest earned is $16\frac{2}{3}\%$ and the tax paid by him included the tax due to this interest, then find the difference between the salary of Mr. Alex in this case with his annual salary calculated before without considering the tax on interest, assuming all other things remain the same?
(A) ₹7,500 (B) ₹7,200 (C) ₹5,000 (D) ₹6,000

20. Had the standard deduction been one-sixth of the annual salary, all other things remaining the same, then what would have been his monthly salary?
(A) ₹59,000 (B) ₹60,000 (C) ₹70,000 (D) ₹80,000

Key

Exercise – 5(a)

1. C	5. B	9. D	13. D	17. A
2. A	6. 60	10. A	14. A	18. A
3. A	7. 138	11. A	15. B	19. D
4. B	8. 85	12. C	16. B	20. A

Exercise – 5(b)

1. C	5. A	9. D	13. 54	17. D
2. C	6. D	10. B	14. 50	18. A
3. C	7. B	11. 20	15. 50	19. C
4. D	8. B	12. 100	16. C	20. B