ARITHMETIC

In this chapter you will learn about :

1. Ratio
2. Proportion
3. Percentage
4. Profit , loss
5. Simple interest

Real Time applications:

Business mathematics is mathematics used by commercial enterprises to record and manage business operations. Commercial organizations use mathematics in accounting,inventory management,marketing,salesforecasting,financial analysis and agribusiness. Business management canbe made more effective in some cases by use of more advanced mathematics such as calculus,matrix algebra and linear programming. Examples used for problems in Business Mathematics are usually real life problems from the business world. Business mathematics teaches us the mathematical concepts and principlesof multivariate calculus, and matrix algebra, differential equations and their applications in business.Business mathematics involves concept understanding,problem formulation and solution, graphing etc.

1.RATIO

§§ Introduction:

Business mathematics also known as commercial mathematics. It deals with the commerce and other practical subjects that are used in daily life

§§ Ratio:

The relation of two quantities (both of the same kind and in the same unit) obtained on dividing one quantity by the other is called their ratio.

Thus, the ratio of a to b is the fraction $\frac{a}{b}$, written as a:b.

In the ratio a:b , a is called **first term**(or) **antecedent** and b is called **second term** (or) **consequent**

Ex: 2:3

2-first term(or) antecedent.

3-second term (or) consequent

2:3 can be written as $\frac{2}{3}$.

¶¶ Meaning of the two quantities of the same kind and in the same unit:

Both the quantities must of the same kind, means: if one quantity is length, the other qunatity must also be length; if quantity represents mass the other qunatity must also be representing mass and so on.

♣ Important Points:

1. The ratio of two quantities of same kind in the same units is the fraction that one is of quantity another.

2. The ratio a to b is denoted by a : b (or) a/b and read it as " a is to b".

3. In a : b, 'a' as the first term (or) antecedent and 'b' as second term (or) consequent.

4. The ratio between two quantities of same kind in same unit is obtained on dividing the first quantity by second.

5. Ratio is a fraction. It has no units.

6. To find the ratio between two qunatities of same kind both the qunatities should be taken in the same units.

7. If each term of a ratio be multiplied or divided by the same non - zero number. The ratio remains same.

8. To convert a ratio a : b in the simplest form divide a and b by H.C.F of a and b.

9. a : b > c : d = a/b > c/d

10. The compound ratio of a : b , c : d , e : f is ace : bdf.

11. Duplicate ratio of a : b is $a^2 : b^2$

12. Sub - duplicate ratio of a : b is $\sqrt{a} : \sqrt{b}$

13. Triplicate ratio of a : b is $a^3 : b^3$

14. Sub triplicate ratio of a : b is $\sqrt[3]{a} : \sqrt[3]{b}$

15. The reciprocal or inverse ratio of a: b = b : a

§§ Converting into simple ratio:

To express a ratio into simple ratio divide the first term of the ratio by its second term and then simplify or multiply each terms of the ratio by the L.C.M of theri denominators and then simplify.

Ex: Given ratio

$$3\frac{1}{2} : 2\frac{1}{3} = \frac{7}{2} : \frac{7}{3}$$

$$= \frac{7}{2} X \frac{3}{7} = \frac{3}{2} = 3 : 2$$

Alternate method:

$$3\frac{1}{2} : 2\frac{1}{3} = \frac{7}{2} : \frac{7}{3} = \frac{7}{2} X\ 6 : \frac{7}{3} X\ 6$$

$$= 21 : 14 = \frac{21}{14} = \frac{3}{2} = 3 : 2$$

TEACHING TASK

I) ***MCQ's with Only One Option is correct:***

1. Two numbers are in the ratio 5 : 8 and the difference is 12 then numbers are...

A) 20 , 34 B) 20 , 23 C) 20 , 32 D) 25 , 40

2. Reena weighted 63 kg. She reduced her weight in the ratio 9 : 8 then her new weight is...

A) 49 B) 42 C) 65 D) 56

3. Among the following which is greater 1 : 7 ; 27 : 63 ; 16 : 56 is...

A) 27 : 63 B) 16 : 56 C) 1 : 7 D) None

4. The salary of Ravi increases in the ratio 3 : 5. His new salary is Rs.12,500.Then his orginial salary was...

A) Rs.6500 B) Rs.5500 C) Rs.7500 D) Rs.8700

5. Rs.414 is is divided into three parts such that first one 2/3 of second part and ratio between second and third part is 5 : 7 then value of thrid part is...

A) Rs.176 B) Rs.189 C) Rs.279 D) Rs.379

6. If l : m = $2\frac{1}{2} : 1\frac{2}{3}$ and m : n = $1\frac{1}{4} : 3\frac{1}{2}$ find l : m : n?

A) 15 : 11 : 18 B) 15 : 11 : 17 C) 15 : 10 : 28 D) 17 : 10 : 28

7. The ratio of $4^{3.5} : 2^5$ is...

A) 2 : 1 B) 4 : 1 C) 7 : 5 D) 7 : 10

8. 2A = 3B and 4B = 5C then A : C = ...

A) 4 : 3 B) 8 : 15 C) 15 : 8 D) 3 :4

9. The ratio of three numbers is 3 : 4 : 5 and sum of their squares is 1250 the sum of the numbers is...

A) 30 B) 50 C) 60 D) 90

10. Two whole numbers sum is 72 cannot be in the ratio.

A) 5 : 7 B) 3 : 5 C) 3 : 4 D) 4 : 5

II) MCQ's with multiple correct answer.

- *This section contains multiple choice questions. Each question has 4 choices (A), (B), (C),(D), out of which **ONE or MORE** is correct. Choose the correct options*

1. What is the ratio whose terms differ by 40 and measure of which is 2/7 ?

A) 16 : 56 B) 32 : 112 C) Duplicate ratio 4 : $2\sqrt{14}$ D) 56 : 16

2. If a carton containing a dozen mirrors is dropped, which of the following can be ratio of broken to unbroken mirrors?

A) 2 : 1 B) 3 : 1 C) 3 : 2 D) 7 : 5

III) Reasoning and Assertion

- *This section contains certain number of questions. Each question contains Statement – 1 (Assertion) and Statement – 2 (Reason). Each question has 4 choices (A), (B), (C) and (D) out of which **ONLY ONE** is correct Choose the correct option.*

1. **Statement - I :** The triplicate ratio of 3 : 7 is 27 : 343

Statement - II : The triplicate ratio of a : b is $a^3 : b^3$

A) Both statement I and statement II are true.

B) Both statement I and statement II are false.

C) statement I s true and statment II is false.

D) statement I s false and statment II is true.

IV) Match the following.

- *This section contains Matrix-Match Type questions. Each question contains statements given in two columns which have to be matched. Statements (A, B, C, D) in **Column–I** have to be matched with statements (p, q, r, s) in **Column–II**. The answers to these questions have to be appropriately bubbled as illustrated in the following example.*
  If the correct matches are A-p, A-s, B-q, B-r, C-p, C-q and D-s, then the correctly bubbled 4 × 4 matrix should be as follows:

Column - I	Column - II
a) If a : b = 5 : 9 and b : c = 3 : 5 and a : b : c = x : 9 : 15 then x =	i) 5
b) $\frac{1}{7} : \frac{1}{x} = \frac{1}{2x} : \frac{1}{14}$ then x =...	ii) 3
c) The ratio of three numbers 3 : 4 : 5 and their product is 60000 and first number is 5y,then y=	iii) 7
d) If (a+b) : (b+c) : (c+a) = 6 : 7 : 8 and a+b+c = 14 then c = ...	iv) 4
e) Two numbers are in the ratio 1 : 2 if 7 is added to both.Their ratio changes to 3 : 5,then one number is...	v) 6

A) a -1 , b - 2, c - 5 , d - 3 , e - 4 B) a -1 , b - 2, c - 4 , d - 3 , e - 5
C) a -2 , b - 1, c - 5 , d - 3 , e - 4 D) a -1 , b - 5, c - 2 , d - 3 , e - 4

V) Solve the following :

1. If 7A = 5B = 8C then find A : B : C. **[40:56:35]**

2. If x : y = 5 : 2 then the value of (8x+9y) : (8x+2y). **[29:22]**

3. Rs. 1210 were divided among A, B, C so that A : B = 5 : 4 and B : C = 9 : 10 then find the share of C? **[400]**

4. In a bag, there are coins 25p, 10p, 5p in the ratio 1 : 2 : 3. If there are Rs.30 in all how many 5p coins are there? **[150]**

Sol: 25x+20x+15x=3000 =>60x=3000 =>x=50 =>
5p coins amount=15x=15(50)=750, that means 5p coins amount= 750
so no. of 5p coins 150.

5. Find a fraction which bears the same ratio to $\frac{1}{27}$ that $\frac{3}{11}$ does to $\frac{5}{9}$ is equal.

Sol: $\frac{3}{11} X\, P = \frac{5}{9} \Rightarrow P = \frac{55}{27}$

$\frac{55}{27} X\, Q = \frac{1}{27} \Rightarrow Q = \frac{1}{55}$

6. A sum of Rs1300 is divided among P,Q,R and S such that

$\frac{P^{'s}\ share}{Q^{'s}\ share} = \frac{Q^{'s}\ share}{R^{'s}\ share} = \frac{R^{'s}\ share}{S^{'s}\ share} = \frac{2}{3}$ then find the share of P. **[160]**

Sol: $\frac{P}{Q} = \frac{2}{3}, \frac{Q}{R} = \frac{2}{3}, \frac{R}{S} = \frac{2}{3}$ Let Q= x, then $P = \frac{2x}{3}, R = \frac{3x}{2}$ and $S = \frac{3R}{2} \Rightarrow \frac{9x}{4}$

P+Q+R+S=1300 => x=240 => P share = 160

7. A sum Rs. 53 is divided among A,B,C in such a way that A gets Rs.7 more than what B gets, B gets Rs. 8 more than C. Find the ratio of their shares. **[25:18:10]**

8. Rs.425 is divided among 4 men, 5 women and 6 boys such that the share of a man, a women and a boy may be in the ratio of 9 : 8 : 4. What is share of women. **[34]**

KEY

Φ Φ TEACHING TASK :

I) 1.C 2.D 3.A 4.C 5.B 6.C 7.B 8.C 9.C 10.C

II) 1. A,B,C 2.A,B,D **III)** 1.A **IV)** 1) C

LEARNER'S TASK

BEGINNERS (LeveL - I)

I) MCQ's with Only One Option is correct:

1. In word "UNIFIED COUNCIL" , the ratio of number of consonents to the number of vowels is

   A) 5:9 B) 6:8 C) 11:3 D) 1:1

2. The school library receives a delivery of 9 news papers and 11 magazines daily. Then 11:20 is the ratio of

   A) News papers to magazines B) News papers to total publications

   C) Magazines to news papers D) Magazines to total publications

3. The ratio $\frac{a}{b}$ is also written as

   A) a:b B) b:a C) $\frac{b}{a}$ D) a+b

4. If the antecedent and consequent of a ratio are multiplied or divided by same number its value

   A) Changes B) Doubled C) 4 times D) Doesn't change

5. 30:36 in the lowest form/standard form

   A) 6:5 B) 5:6 C) 4:5 D) 5:8

6. The inverse ratio of 4:5 is

   A) 4:5 B) 5:6 C) 20:25 D) 5:4

7. The ratio of 2kg to 900 grams is

   A) 2:900 B) 2000:9 C) 20:9 D) 2:94.

8. A ratio equivalent to 2:3 is

   A) 4: 3 B) 2:6 C) 6:9 D) 10:9

9. The angles of a triangle are in the ratio 1:2:3 the measure of the largest angle is

   A) 30^0 B) 60^0 C) 90^0 D) 120^0

10. The sides of a triangle are in the tation 2:3:5 if its perimeter is 100 cm, the length of its smallest side is

   A) 2 cm B) 20cm C) 3cm D) 5 cm

11. Two numbers are in the ratio 7 :9 if the sum of the numbers is 112m then the larger number is

   A) 63 B) 42 C) 49 D) 72

12. The ratio 384 : 480 in its simplest form is

A) 3 :5 B) 5 : 4 C) 4 : 5 D) 2: 5

13. In A, B, C, divide Rs. 1200 in the ratio B's share is

A) Rs.240 B) Rs.600 C) Rs.380 D) Rs.360

14. If a bus travels 126 Km in 3 hours and a train travels 315 km in 5 hours, then the ratio of their speed is

A) 2:5 B) 2:3 C) 5:2 D) 25:6

15. The ratio of male and female employees in a multinational company is 5 : 3. If there are 115 male employees in the company, then the number of female employees is

A) 96 B) 52 C) 69 D) 66

16. Length and width of a field are in the ration 5 : 3. If the width of the feld is 42m,then its length is

A) 50m B) 70m C) 80m D)100m

ACHIEVERS (Level - II)

Solve the following :

1. Express each of the following in its simplest form:

i) 4 : 6 ii) 48 : 54 iii) 200 : 250 iv) 5 kg : 800 gm v) 30 cm : 2m

2. A man's monthly income is Rs.1274 out of which he spends Rs.1078 every month. Find ratio of his

i) income to expenditure ii) savings to income iii) savings to expenditure

3. Divide 525 between A and B in the ratio 2:3.

4. The side of triangle are in the ratio 2:3:4. If its perimeter is 54cm. Find the lengths of sides of triangle.

5. Two numbers are in the ratio 5:6. If 8 is subtracted from each, the ratio becomes 4:5. Find the numbers.

6. An alloy of zinc and copper weighs $12\frac{1}{2}$ kg. If, in the alloy, the ratio of zinc and copper is 1 : 4, find the weight of copper in it.

7. How will Rs. 31,500 be shared between A,B and C, if A gets the double of what B gets, and B gets the double of what C gets?

EXPLORERS (Level - III)

I) MCQ's with multiple answer correct.

- *This section contains multiple choice questions. Each question has 4 choices (A), (B), (C),(D), out of which **ONE or MORE** is correct. Choose the correct options*

1. If A:B = 1 : 2 ; B : C = 3 : 4 ; C : D = 2 : 3 and D : E =3 : 4 then

A) A : B : C : D : E = 3 : 6 : 8 : 12 : 16 B) B : E = 3 : 8

C) A : E = 3 : 1 D) B : D = 3 : 2

2. The compound ratio of 2 : 3, 6 : 11 and 11 : 12 is...

A) 1 : 3 B) 2 : 1 C) 11 : 24 D) 36 : 108

3. If (5x+3) : (3x+1) is the triplicate ratio of 4 : 3 then...

A) $x = \frac{17}{57}$ B) $x = \frac{16}{57}$ C) $x = \frac{16}{52}$ D) $1 - x = \frac{40}{57}$

II) Reasoning and Assertion

- *This section contains certain number of questions. Each question contains Statement – 1 (Assertion) and Statement – 2 (Reason). Each question has 4 choices (A), (B), (C) and (D) out of which **ONLY ONE** is correct Choose the correct option.*

1. **Statement - I :** 18 , 45 , 2 , 5 are in the proportion

Statement - II : Four quantities a,b,c,d are said to be in proportion

A) Both statement I and statement II are true.

B) Both statement I and statement II are false.

C) statement I s true and statment II is false.

D) statement I s false and statment II is true.

III) Matching

- *This section contains Matrix-Match Type questions. Each question contains statements given in two columns which have to be matched. Statements (A, B, C, D) in **Column–I** have to be matched with statements (p, q, r, s) in **Column–II**. The answers to these questions have to be appropriately bubbled as illustrated in the following example.*

  If the correct matches are A-p, A-s, B-q, B-r, C-p, C-q and D-s, then the correctly bubbled 4 × 4 matrix should be as follows:

Column - I	Column - II
a) Rs. 150 : Rs.350	i) 1 : 5
b) Rs.1 : 15 paise	ii) 3 : 7
C) 2 scores : 3 dozens	iii) 20 : 3
d) 240 m : $1\frac{1}{5}$ km	iv) 10 : 9
	v) 2 : 10

A) a -1 , b - 2, c - 5 , d - 3 B) a -2 , b - 4, c - 3 , d - 1,5

C) a -2 , b - 3, c - 4 , d - 1,5 D) a -2 , b - 4, c - 3 , d - 1

RESEARCHERS (Level - IV)

1. A : B : C = 2 : 3 : 4 then $\frac{A}{B}:\frac{B}{C}:\frac{C}{A}$ =... [SSC-02]

A) 4 : 9 : 16 B) 8 : 9 : 12 C) 8 : 9 : 16 D) 8 : 9 : 24

2. A : B = 2 : 3, B : C = 4 : 5, C : D = 6 : 7 then A : B: C: D=... [SSC-02]

A) 16 : 22 : 30 : 35 B) 16 : 24 : 15 : 35
C) 16 : 24 : 30 : 35 D) 18 : 24 : 30 : 35

3. Salaries of Ravi and Sumit are in the ratio 2 : 3. If the salary of each is increased by Rs.4000 the new ratio becomes 40 : 57 what is the sumit's present salary. [IMT - 02]

A) Rs.17,000 B) Rs.20,000 C) Rs.25,000 D) None

4. If $1\frac{3}{4}:2\frac{1}{2}:1\frac{1}{6}$ is A:B:C then..... [RAMANAJUAN-13]

A) A = B = C B) B>A>C C) C>A>B D) B>C>A

5. It is given that $\frac{x}{y}=\frac{4}{5}$. Which one of the following incorrect. [AMTI - 07]

A) $\frac{x+y}{y}=\frac{9}{5}$ B) $\frac{y+2x}{x}=\frac{13}{4}$ C) $\frac{x^2+y^2}{xy}=\frac{41}{20}$ D) $\frac{2x^2-y^2}{xy}=\frac{9}{20}$

KEY

Φ Φ LEARNER'S TASK:

☐	**BEGINNERS :**	1. D	2.D	3.A	4.D	5.B	6.D	7.C	8.C	9.C
		10.B	11. A	12.C	13.D	14.B	15.C	16.B		
☐	**EXPLORERS : I)**	1. A	2.A,D	3.A,D	**II)** 1) A		**III)** 1) C			
☐	**RESEARCHERS :**	1) D	2) B	3) D	4) B	5) D				

1.PROPORTION

§§ Proportion:

When four quantities are so related that the ratio between the first and the second quantity is equal to the ratio between the third and the fourth quantity, the qunatities are said to be in proportion.

Thus, proportion is equaltiy of two ratios

i) Each qunatity in a proportion is called its term or its proportional.

ii) In a proportion, the first and the last terms are called the extremes, where as the second and the third terms are called the means.

iii) For every proportion, the product of the extremes is always equal to the product of the means.

§§ Continued proportion:

Three qunantities are said to be in contined proportion, if the ratio between the first and the second qunatity is equal to the ratio between the second and the third quantity.

i.e., a,b and c are in continued proportion, if a:b = b:c

The second qunatity is called the mean proportional between the first and the thrid.

i.e., in a : b = b : c, b is the mean proportional between a and c.

The third qunatity is called the third proportional to the first and the second.

i.e., in a : b = b : c, c is the third proportional to a and b.

- ♣ If $\frac{a}{b}=\frac{c}{d}$ then $\frac{a+b}{b}=\frac{c+d}{d}$ [**Componendo Rule**]
- ♣ If $\frac{a}{b}=\frac{c}{d}$ then $\frac{a-b}{b}=\frac{c-d}{d}$ [**Dividendo Rule**]
- ♣ If $\frac{a}{b}=\frac{c}{d}$ then $\frac{b}{a}=\frac{d}{c}$ [**Invertendo Rule**]
- ♣ If $\frac{a}{b}=\frac{c}{d}$ then $\frac{a}{c}=\frac{b}{d}$ [**Alternendo Rule**]
- ♣ If $\frac{a}{b}=\frac{c}{d}$ then $\frac{a}{a-b}=\frac{c}{c-d}$ [**Convertendo Rule**]
- ♣ If $\frac{a}{b}=\frac{c}{d}$ then $\frac{a+b}{a-b}=\frac{c+d}{c-d}$ [**Componendo - Dividendo Rule**]

♣ If $\frac{a}{b}=\frac{c}{d}$ then $\frac{a}{b}=\frac{a+c}{b+d}=\frac{a-c}{b-d}$

§§ Direct proportion :

If two quantities are so related that an increase (or decrease) in one cause corresponding (or decrease) in other, then they are said to be n direct proportion (or) direct variation.

Ex: Consider number of books of same price ; and their total cost price of 3 books =Rs.12 ; price of 6 books =Rs.24.

Direct variation can represent in two variables x and y as x α y.

(x is direct proportional to y)

x α y => x=ky where k is constant

$\frac{x}{y}$ =k (constant) By comparing pair of two quantities $\frac{x_1}{y_1}=\frac{x_2}{y_2}$.

§§ Inverse proportion :

If two quantities are related such that increase in one cause decrease in other quantity (vice versa) then they said to have inverse proportion.

For two quantities x and y such that

x α $\frac{1}{y}$ (x and y are inversely varied)

x=k.$\frac{1}{y}$ where k is constant

xy=constant

By comparing pair of two similar quantities $x_1y_1=x_2y_2$

TEACHING TASK

I) MCQ's with single correct answer type.

1. $\frac{1}{5}:\frac{1}{x}=\frac{1}{x}:\frac{1}{1.25}$ then the value of x is...

A) 1.5 B) 2 C) 2.5 D) 3.5

2. If x : y = 5 : 2 then (8x+9y) : (8x+2y) is...

A) 22 : 29 B) 26 : 61 C) 29 : 22 D) 61 : 26

3. If x : y = 2 : 1 then $\left(x^2-y^2\right):\left(x^2+y^2\right)$=...

A) 3 : 5 B) 5 : 3 C) 1 : 3 D) 3 : 1

4. If $\left(4x^2-3y^2\right):\left(2x^2+5y^2\right)$ then x : y is...

A) 2 : 3 B) 1 : 2 C) 3:2 D) 2 : 1

5. If $x^2+4y^2=4xy$ then x : y is...

A) 2 : 1 B) 1 : 2 C) 1 : 1 D) 1 : 44

6. If then (x+5):(y+8) is equal to...

A) 3 : 5 B) 13 : 8 C) 8 : 5 D) 5 : 8

7. If $\frac{a}{3}=\frac{b}{4}=\frac{c}{7}$ then $\frac{a+b+c}{c}$ =...

A) 7 B) 2 C) 1/2 D) 1/7

8. If x varies directly as 3y+1 and x=9 when y =1, then what values of x when y=5?

A) 11 B) 10 C) 20 D) 36

9. What is the value of $\frac{P+Q}{P-Q}$ if $\frac{P}{Q}=\frac{4}{3}$

A) 6 B) 7 C) 8 D) 9

10. If $\frac{5a+3b}{2a-3b}=\frac{23}{5}$ then find the value of $\frac{a}{b}$ ....

A) 4 B) $\frac{2}{7}$ C) $\frac{3}{2}$ D) $\frac{5}{7}$

II) MCQ's with multi correct answer.

- *This section contains multiple choice questions. Each question has 4 choices (A), (B), (C),(D),* out of which ***ONE or MORE*** *is correct. Choose the correct options*

1. If $\frac{a}{b}=\frac{c}{d}=\frac{e}{f}$ =k then k=....

A) $\frac{ap+cq+er}{bp+dq+fr}$ B) $\frac{a+b+c}{b+d+f}$ C) $\frac{ap+cq+ef}{ap+cf+er}$ D) $\frac{a+b}{b+d}$

2. $\frac{a}{b}=\frac{c}{d}$ then....

A) $\frac{a-b}{b}=\frac{c-d}{d}$ B) $\frac{a-b}{d}=\frac{c-d}{b}$

C) $\frac{a-d}{a}=\frac{b-c}{a}$ D) $\frac{a-k}{b-k}=\frac{c-k}{d-k}$

III) Reasoning and Assertion type

- *This section contains certain number of questions. Each question contains Statement – 1 (Assertion) and Statement – 2 (Reason). Each question has 4 choices (A), (B), (C) and (D) out of which **ONLY ONE** is correct Choose the correct option.*

1. **Statement - I :** If the cost of 15 maths olympiad books is Rs.1500, then the cost of 25 maths olympiad books is Rs.2500.
Statement - II : If two variables x and y vary directly then x= ky

A) Both statement I and statement II are true.

B) Both statement I and statement II are false.

C) statement I s true and statment II is false.

D) statement I s false and statment II is true.

IV) Solve the following:

1. There is a food for 760 men for 22 days. How many more men should join after two days so that same food may last for 19 days? **[40]**

2. A town with a population of 2000 has provisions for 30 days after 10 days, 500 more men are added. How long will the food last at the same rate. **[16]**

3. A person has money to buy 25 cycles worth Rs.500 each. How many cycles he will be able to buy if each cycle is costing Rs.125 more? **[20]**

4. 11 men can dig $6\frac{3}{4}$ meter long trench in one day. How many men should be employed for digging 27m long trench of same type in one day. **[44]**

5. If 20 men can build a wall 56 meters long in 6 days what length of similar wall can be built by 35 men in 3 days. **[49]**

KEY

ΦΦ TEACHING TASK:

I) 1. C 2.C 3.A 4.C 5.A 6.D 7.B 8.D 9.B 10.A

II) 1. A,C 2.A **III)** 1) A

LEARNER'S TASK

BEGINNERS(Level - I)

I) ***MCQ's with single correct answer type.***

1. Which of the following are in proportion.

A) 16,28,4,7 B) 20,18,5,6 C) 9,3,27,15 D) 16,4,2,10

2. The first, third,fourth terms are proportion are 18,27,36 then second termis

A)3 B) 18 C) 24 D) 12

3. If 8,x^2,2 are in proportion, the value of x.

A) 4 B) 8 C) 2 D) $\sqrt{32}$

4. If $\frac{3}{7},\frac{12}{7},\frac{6}{7},x$ are in proportion, the value of x .

A) $\frac{1}{7}$ B) $\frac{2\,4}{7}$ C) $\frac{3}{7}$ D)24

5. Which of the following is proportion ?

A) $\frac{3}{4}=\frac{4}{8}$ B) $\frac{3}{4}=\frac{5}{8}$ C) $\frac{3}{4}=\frac{6}{8}$ D) $\frac{3}{4}=\frac{7}{8}$

6. Fourth proportional of 24;18;12 is

A) 9 B) 10 C) 11 D) 20

7. The mean proportional of '16' and '9' is

A) 10 B) 11 C) 12 D) none

8. Fourth proportional of a;b;c is

A) $\frac{ac}{b}$ B) abc C) $\frac{ab}{c}$ D) $\frac{bc}{a}$

9. If 'b' is the mean proportional between 'a' and 'c' then

A) $a^2 = bc$ B) $b^2=ac$ C) $c^2=ab$ D) all of these

10. If 3:5=x:20 then x= ?

A) 10 B) 11 C) 9 D) 12

11. If 57 : X= 51 : 85, then the value of X is

A) 95 B) 76 C) 114 D) none of these

12. The ratio of boys and girls in a school is 12 : 5. If there are 840 girls in the school, then the number of boys is

A) 1190 B) 2380 C) 2856 D) 2142

13. If 4, a, a, 36 are in proportion, then *a* =

A) 24 B)12 C) 3 D) 24

14. If 5 : 4 : : 30 : X, then the value of X is

A) 24 B) 12 C) $\frac{3}{2}$ D) 6

15. If a, b, c, d are in proportion, then

A) ab=cd B) ac=bd C) ad=bc D) none of these

16. If a, b, c, are in proportion, then

A) $a^2 = bc$ B) $b^2 = ac$ C) $c^2 = ab$ D) None of these

17. If the cost of 5 bars of a soap is Rs. 30, then the coat of one dozen bars is

A)Rs.60 B) Rs.120 C) Rs.72 D) Rs.140

18. 12 men can finish a piece of work in 25 days. The number of days in which the same piece of work can be done by 20 men, is

A) 10 days B) 12 days C) 15 days D) 14 days

19. If the cost of 25 packets of 12 pencils each is Rs 750, then the cost of 30 packets of 8 pencils each is

A) Rs.600 B) Rs.720 C)Rs.640 D) none of these

20. If a,b,c are in proportion, then

A) a:b :: b:c B) a:b :: c:a C) a:b :: c:b D) a:c :: b:c

21. The first, second and fourth terms of a proportion are 16, 24 and 54 respectiverly. The third term is

A) 32 B) 48 C) 28 D) 36

22. The third proportion to $\left(x^2 - y^2\right)$ and x-y is...

A) $\frac{x-y}{x+y}$ B) $\frac{x^2-y^2}{x+y}$ C) $\frac{x^2-y^2}{x-y}$ D) $\frac{x^2-y^2}{(x+y)^2}$

23. If x,5,10,y are in continued proportion then find x and y?

A) 5 , 20 B) $\frac{5}{2}, 10$ C) $\frac{5}{2}, 20$ D) $20, \frac{5}{2}$

24. What is the least number(s) must be subtracted from each numbers 14,17,34 and 42 so that remainders my be proportional?

A) 0 B) 1 C) 2 D) 7

ACHIEVERS (LeveL - II)

Solve the following:

1. The first, second and the fourth terms of a proportion are 6,18 and 75 respec tively. Find its third term.
2. Find the second term of the proportion whose first, third and fourth terms are 9 , 8 and 24 respectively.
3. The ratio of copper and zinc in an alloy is 9 : 8. If the weight of zinc in the alloy is 9.6kg. Find the weight of copper in the alloy.
4. The ration of the length and the width of a school ground is 5 : 2. Find the length, if the width is 40 meters.
5. The ratio of the number of girls to the number of boys in a school is 2 : 5. If the number of boys is 225, then find i) the number of girls in the school ii) the number of students in the school.
6. Weight of 8 identical articles is 4.8 kg. What is the wieght 11 such articles?
7. 6 books weigh 1.260 kg. How many books will weigh 3-150kg?
8. $3\frac{1}{2}$ m of cloth costs Rs.168, fidn the cost of $4\frac{1}{3}$ m of the same cloth.
9. A camp has provisions for 60 pupil for 18 days. In how many days, the same provisions will finish off it the strength of the camp is increased to 72 pupil.
10. A garrison of 1200 men has provisions for 15 days. How long will the provisions last if the garrison be increased by 600 men?

EXPLORERS (Level - III)

II) REASONING AND ASSERTION.

- *This section contains certain number of questions. Each question contains Statement – 1 (Assertion) and Statement – 2 (Reason). Each question has 4 choices (A), (B), (C) and (D) out of which **ONLY ONE** is correct Choose the correct option.*

1. **Statement - I :** If a,b,c,d are in proportional then ad=bc

   Statement - II : Third proportional to a,b is $\sqrt{ab}$

   A) Both statement I and statement II are true.
   B) Both statement I and statement II are false.
   C) Statement I s true and statment II is false.
   D) Statement I s false and statment II is true.

III. MATCH THE FOLLOWING

- *This section contains Matrix-Match Type questions. Each question contains statements given in two columns which have to be matched. Statements (A, B, C, D) in **Column–I** have to be matched with statements (p, q, r, s) in **Column–II**. The answers to these questions have to be appropriately bubbled as illustrated in the following example.*
  If the correct matches are A-p, A-s, B-q, B-r, C-p, C-q and D-s, then the correctly bubbled 4 × 4 matrix should be as follows:

	Column - I	Column - II
2.	a) (2x+3y) : 3y = 4 : 3 then $\frac{y}{x}$	1) 9
	b) The third proportional to 25	2) 75
	c) The mean proportional to 9 and 25is	3) 2
	d) The fourth proportional to 5 , 15 , 25 is..	4) 15

A) a -1 , b - 3, c - 4 , d - 2 , B) a -2 , b - 3, c - 4 , d - 1
C) a -1 , b - 3, c - 2 , d - 4 D) a -3 , b - 1, c - 4 , d - 2

IV) COMPREHENSION TYPE :

- *This section contains paragraph. Based upon each paragraph multiple choice questions have to be answered. Each question has 4 choices (A) , (B) ,(C) and (D) out of which **ONLY ONE i**s correct. Choose the correct option.*

Two qunatities x and y are in i) directly proportional , if x=ky ii) Inversely proportional, if xy = k, where k is proportionality constant.

3. Two qunatities 'x' and 'y' are in directly proportional such that x = 102 and y = 170. Then proportinality constant, k=...

A) 0.6 B) 6 C) 60 D) 0.06

4. Given x = 20, y = 15 and $x \alpha y$. If x=4 then y =...

A) 16 B) 3 C) 9 D) 4

5. Given $x \alpha \frac{1}{y}$, x = 185 and y =4. If y = 10 , then x = ...

A) 76 B) 75 C) 74 D) 73

6. If x and y vary directly and x = 18 when y = 6. If y - 8 then the value of x is...

A) 32 B) 16 C) 24 D) 48

7. A car runs 484 kms with 11 liters of petrol. If it travels 264 kms then the number of liters of petrol is requires is...

A) 8 liters B) 9 liters C) 6 liters D) 4 liters

KEY

ΦΦ LEARNER'S TASK:

☐ **BEGINNERS :**	1.A	2.C	3. A	4. B	5.C	6.A	7.C	8.D	9.B
	10.D	11.A	12.C	13.B	14.A	15.C	16.B	17.C	18.C
	19.A	20.S	21.D	22-A	23-C	24-C			
☐ **EXPLORERS :**	1-A	2-D	3-A	4-B	5-C	6-C	7-A		

3.PERCENTAGES

¶¶ **Common fractions :** Fractions of the form $\frac{2}{3}, \frac{5}{8}, \frac{-31}{2}, \frac{9}{4}$....are called common fractions.

¶¶ **Decimal fractions :** Fractions of the form $\frac{2}{10}, \frac{5}{100}, \frac{-31}{1000}$ ...are called decimal fractions.

§§ **Percentage :** Fractions of the form $\frac{1}{100}, \frac{2}{100}, \frac{5}{100}, \frac{9}{100}$ ... are called percentages.

Note : 1) The symbol for the percent is **% .**
2) The word percent is an abbrevation of latin phrase "percentum" which means per hundred (or) out of hundred.
3) Percentage has **no units.**
4) When a qunatity is expressed in percent form, it is called percentage.

Ex: i) $\frac{3}{100}$ =3%

ii) Geetha got 83 marks out of 100. Means she got 83% of marks.

iii) 5% = 5 out of hundred = $\frac{5}{100} = \frac{1}{20}$

¶¶ **To convert a percentage into fraction:**

For converting a percentage into a fraction divide it by 100 and remove the sign %

thus a% = $\frac{a}{100}$.

Ex: $14\% = \frac{14}{100}$, ii) $6\frac{2}{3}\% = \frac{20}{3}\% = \frac{20}{3} X \frac{1}{100} = \frac{1}{15}$

¶¶ **To convert a fraction into percentage:**

For converting a fraction into a percentage multiply the fraction by 100 and put the % thus $\frac{a}{b}=\left(\frac{a}{b}X100\right)\%$.

Ex : $\frac{11}{16}=\left(\frac{11}{16}X100\right)\%=68\frac{3}{4}\%$

$5\frac{1}{4}=\left(\frac{21}{4}X100\right)\%=525\%$

§§ **Percentage as ratio:**

A percentage can be expressed as ratio with first term equation to given percentage and second term is 100.

Ex : 50 % = $\frac{50}{100}=\frac{1}{2}=1:2$

§§ **Ratio as a percentage:**

First write the ratio as a fraction and then multiply with 100 to get percentage.

Ex : convert 23 : 40 into percentage

23 : 40 = $\frac{23}{40}X100=\frac{115}{2}\%=57\frac{1}{2}\%$

§§ **Percentage as a decimal :**

First convert the given percentage as a fraction and these convert this fraction into decimal form.

73 % = $\frac{73}{100}$=0.73

§§ **Decimal as a percentage :**

Convert the given decimal into a fraction and these multiply by 100 to get the per centage.

Ex : 0.5 % = $\left(\frac{5}{10}X100\right)$=50%

¶¶ **To express the one quantity (Number) as a percentage of other:**

Divide the first qunatity by the second and at the same time multiply the result by 100%.

Ex: i) 20 kg as percentage of 200 kg

= $\frac{20}{200}X100\%=10\%$

ii) 60 paise as a percentage of 200 kg
= 60 paise as a percent of 300 paise

$= \frac{60}{300} X 100\% = 20\%$

Note : In order to express one quantity as a percentage of another quantity both the quantities must have same units.

§§ **Expressing one qunatity as percentage of another quantity:**

Express the given percentage as fraction and multiply by the given number.

i . e., x% of number y means $\frac{x}{100} X\, y$

Ex: 25% of Rs.500 = $\frac{25}{100} X\, 500$ =125

¶¶ **To find increased (or) decreased value of qunatity.**

1. If x is increased by r% then

New quantity = x + $\frac{r}{100} X\, x = \left(1 + \frac{r}{100}\right) x$

$= \left(\frac{100 + r}{100}\right) x$

=(100 + r)% of x

Thus if x is increased by 10% then new quantity = (100+10)% of x

2. If x in decreased by r% = $x - \frac{r}{100} X\, x$

$= \left(1 - \frac{r}{100}\right) X\, x$

$= \left(\frac{100 - r}{100}\right) x$

= (100-r)% of x

Thus if x is decreased by 10% then new quantity is equal to (100-10)%of x= $\frac{90}{100} x$

§§ **Percentage change (increase or decrease) :**

For increase : Increase % = $\frac{increase\ in value}{orginal\ value} X 100$

For decrease : decrease % = $\frac{decrease\ in value}{orginal\ value} X100$

§§ **Percentage error :**

Percentage error = $\frac{difference}{orginal\ value} X100$

TEACHING TASK

I) MCQ's with single correct answer :

1. Asha got 86.875% marks in annual examinations. If she got 695 marks, total number of marks...
A) 700 B) 850 C) 800 D) 900

2. Find the percentage of pure gold in 22 carat gold, if 24 carat gold is hundred percent pure gold.
A) $91\frac{1}{3}\%$ B) $91\frac{3}{2}\%$ C) $92\frac{1}{3}\%$ D) $91\frac{2}{3}\%$

3. A number is increased by 10% and then it is decreased by 10%. The total increase or decrease percent is...
A) 1% B) 2% C) 4% D) 3%

4. 63% of $3\frac{4}{7}$ is...
A) 2.25 B) 2.40 C) 2.50 D) 2.75

5. 860% of 50 + 50% of 860 = ...
A) 430 B) 516 C) 860 D) 960

6. 5% of (25% of 1600)....
A) 5 B) 17.5 C) 20 D) 125

7. x% of y + y% of x = ...% of xy.
A) 5 B) 10 C) 2 D) None

8. A man who spends $66\frac{2}{3}\%$ of his income is able to save Rs.1200 per month. His monthly expense is...
A) 3600 B) 2400 C) 3000 D) 3200

9. If an alloy contains 65% Aluminium and the rest is Zinc, then the weight of zinc in 400 kg of alloy is
A) 120 kg B) 140 kg C) 150 kg D) 160 kg

10. If Preeti scored 510/600 and Pranathi scored 540/600, then the difference in their percentages is

A) 8% B) 6% C) 5% D) 7%

II) Reasoning and assertion :

◆ *This section contains certain number of questions. Each question contains Statement – 1 (Assertion) and Statement – 2 (Reason). Each question has 4 choices (A), (B), (C) and (D) out of which **ONLY ONE** is correct Choose the correct option.*

Statement - I : 20% of 200 is 40

Statement - II : x % of y is $\frac{x}{yX100}$.

A) Both statement I and statement II are true.
B) Both statement I and statement II are false.
C) statement I s true and statment II is false.
D) statement I s false and statment II is true.

KEY

ΦΦ TEACHING TASK: I) 1.C 2.D 3.A 4.A 5.C 6.C 7.C 8.B 9.B 10.C **II)** 1.C

LEARNER'S TASK

BEGINNERS (Level - I)

I) MCQ's with single answer correct :

1. Ram secured 48 marks out of 80 then the percentage of marks is

A) 60% B) 70% C) 80% D) 90%

2. If 65% of 70=g then g=?

A) 40.5 B) 24.5 C) 45.5 D) 45.05

3. 50%of 25 is 25% of following number ?

A) 12.5 B) 25 C) 50 D) 1250

4. The weight of a person is increased from 70kgs to 75kgs. What is the percentage of increase ?

A) $6\frac{1}{6}$ B) $7\frac{1}{7}$ C) $5\frac{1}{5}$ D) $8\frac{1}{8}$

5. Ramu secured 80% of marks in class VI, If the exam was conducted for 1200marks, Marks obtained by Ramu is

A) 620 B) 800 C) 960 D) 1060

6. If David scored 450 marks out of 600 marks, then the percentage of marks obtained by him is

A) 72% B) 74% C) 75% D) 73

ACHIEVERS (Level - II)

Solve the following :

1. A student secures 90% , 60% , 54% of marks in test papers with 100, 150 and 200 respectively as maximum marks. Find the percentage of his aggregate?

2. Three candidates contest an election and received 1136, 7636 and 11628 votes respectively what percent of total votes did the winning candidates get?

3. If Raju's salary increases by 12½% every year. If his present salary is Rs.4200, then find his next year salary.

4. The population of a city is 8 lakhs out of the 40% adult females who are eligible for jobs, If 20% are government employees and 25% are private employees and the rest are servant maids, then find the number of servants.

EXPLORERS (Level - III)

I) MCQ's with multi answer correct :

- *This section contains multiple choice questions. Each question has 4 choices (A), (B), (C),(D), out of which **ONE or MORE** is correct. Choose the correct options*

1. If 6.25% is expressed as a ratio, then the answer is

A) 1 : 160 B) 1 : 16 C) 16 : 1 D) 160 : 1

2. A scooter costs Rs. 15000/-. If its value is reduced to 10000/- then the decrease percent is

A) $33\frac{1}{2}\%$ B) $33\frac{1}{4}\%$ C) $33\frac{1}{3}\%$ D) $33\frac{1}{5}\%$

3. If you increase 400 by $12\frac{1}{2}\%$, then the increased value is

A) 50 B) 5 C) 500 D) 5000

4. In a class of 80 students, 60 passed in first class and the remaining in the second,then the percentage of students who passed in 2nd class is

A) 15% B) 20% C) 25% D) 10%

5. Ramesh saves 25% petrol every month, If he saves 20 litres per month, then the monthly consumption is

A) 100 liters B) 70 liters C) 80 liters D) 90 liters

6. In measuring a line segment of length 3.75 cm, it was measured as 4 cm by mistake.The error percent is

A) 20/3% B) 22/3% C) $6\frac{2}{3}\%$ D) $7\ \frac{1}{3}\%$

II) Reasoning and assertion :

- *This section contains certain number of questions. Each question contains Statement – 1 (Assertion) and Statement – 2 (Reason). Each question has 4 choices (A), (B), (C) and (D) out of which **ONLY ONE** is correct Choose the correct option.*

1. ***Statement I :*** The side of a square field is 100m. If a lawn of width 5m was laid around, then the percentage increase in area is 12%.

Statement II : $\text{Increased}\% = \left(\frac{\text{increased in value}}{\text{original value}} \times 100\right)\%$

A) Both Statements are true, Statement II is the correct explanation of Statement I.

B) Both Statements are true, Statement II is not correct explanation of Statement I.

C) Statement I is true, Statement II is false.

D) Statement I is false, Statement II is true.

III) Match the following :

- *This section contains Matrix-Match Type questions. Each question contains statements given in two columns which have to be matched. Statements (A, B, C, D) in **Column–I** have to be matched with statements (p, q, r, s) in **Column–II**. The answers to these questions have to be appropriately bubbled as illustrated in the following example.*

If the correct matches are A-p, A-s, B-q, B-r, C-p, C-q and D-s, then the correctly bubbled 4 × 4 matrix should be as follows:

Column - I	Column - II
a) 2 is what percent of 50?	1) 1200%
b) What perent of 7 is 84?	2) 150%
c) $\frac{1}{2}$ is what percent of $\frac{1}{3}$	3) 2%
d) What percent of 6.5 liters is 130 ml	4) 4%

A) a -1 , b - 3, c - 4 , d - 2. B) a -4 , b - 1, c -3 , d - 2

C) a -4 , b - 1, c - 2 , d - 3. D) a -4 , b - 2, c -1, d - 3

RESEARCHERS (Level - IV)

1. If 75% of number is added to 75, then the result is number itself. Then number is...

A) 50 B) 60 C) 300 D) 400

2. A student multiplied a number by $\frac{3}{5}$ instead of $\frac{5}{3}$. What is the percentage error in the calculation?

A) 34% B) 44% C) 54% D) 64%

3. x% of a is same as y% of b then z% of b is...

A) $\frac{xy}{z}\%\ of\ a$ B) $\frac{yz}{x}\%\ of\ a$ C) $\frac{xz}{y}\%\ of\ a$ D) None

KEY

ΦΦ LEARNER'S TASK :

- **BEGINNERS :** 1.A 2.C 3.C 4.B 5.C 6.C
- **EXPLORERS : I)** 1.B 2.C 3.C 4.C 5.C 6.C
  II) 1.D **III)** 1) C
- **RESEARCHERS :** 1) C 2) D 3)C .

4.PROFIT AND LOSS

¶¶ **Introduction:** A shopkeeper buys goods from a manufacturer and he sells to customers.If shopkeeper sells on article at a price, higher than the price at which he buys it, then he gets 'profit' if he sells lower than his buying price, then he gets 'loss'.

¶¶ **Cost price:** The money paid by a shopkeeper to buy an article is called 'cost price' of an article.

¶¶ **Selling price :** The money received by a shopkeeper on selling an article is called 'Selling price' of an article.

§§ **Profit or Gain :** If SP is more than CP, then the seller makes "profit or gain"

Profit=S.P- C.P S.P=C.P+profit C.P=S.P-profit

§§ **Loss:** If S.P is less than the C.P, then the seller incurs a loss.

Loss=C.P-S.P SP=CP-loss CP=Sp+loss

§§ **Profit or loss percentages :**

Profit calculated for Rs.100 is called 'Profit percentage'
Loss calculated for Rs.100 is called 'Loss percentage'

$$\text{Profit percent} = \frac{profit}{C.P} x100 \ ; \ \text{Loss percent} = \frac{loss}{C.P} x100$$

Profit or loss percent always calculated on cost price.

TEACHING TASK

I) MCQ's with single answer correct :

1. A shop keeper buys a toy for Rs.250 and sells it for Rs.285. Find his gain and gain%
A) 35 , 14% B) 35, 24% C) 45 , 34% D) 35 , 27%

2. A person sells an article for Rs.550, gaining $\frac{1}{10}$ of C.P find the gain %
A) 20% B) 30% C) 10% D) 40%

3. A student buys a pen Rs.90 and sells it for Rs.100 then gain %....
A) $11\frac{1}{7}\%$ B) $11\frac{1}{9}\%$ C) $11\frac{1}{6}\%$ D) $11\frac{1}{5}\%$

4. The C.P of 21 articles is equal to S.P of 18 articles. find gain %
A) 16% B) $16\frac{1}{3}\%$ C) $16\frac{2}{3}\%$ D) $17\frac{2}{3}\%$

5. A man bought toffees at 3 for a rupee. How many for a rupee must be sell to gain 50%
A) 1 B) 2 C) 3 D) 4

6. If te selling price of 18 pens is equal to the cost price of 16 pens, find the loss percent.
A) 11% B) $11\frac{1}{9}\%$ C) $11\frac{2}{9}\%$ D) $11\frac{7}{9}\%$

7. Alfered buys an old scooter for Rs.4700 an d spends Rs.800 on its repairs. If he sells the scooter for Rs.5800 then gain%
A) $4\frac{4}{7}\%$ B) $5\frac{5}{11}\%$ C) 10% D) 30%

8. When a commodity is sold for Rs.3480, there is a loss of 2%. What is the cost price of commodity.
A) 26.10 B) 43 C) 43.20 D) 35.59

II) MCQ's with multi correct answer :

- *This section contains multiple choice questions. Each question has 4 choices (A), (B), (C),(D), out of which **ONE or MORE** is correct. Choose the correct options*

1. S.P =

A) $C.P\left(1-\frac{l}{100}\right)$ B) $C.P\left(1+\frac{g}{100}\right)$ C) $C.P\left(\frac{100}{100-l}\right)$ D) $C.P\left(\frac{100}{100+g}\right)$

2. C.P =

A) $S.P\left(1-\frac{l}{100}\right)$ B) $S.P\left(1+\frac{g}{100}\right)$ C) $S.P\left(\frac{100}{100+g}\right)$ D) $S.P\left(\frac{100}{100-l}\right)$

III) Reasoning and Assertion :

- *This section contains certain number of questions. Each question contains Statement – 1 (Assertion) and Statement – 2 (Reason). Each question has 4 choices (A), (B), (C) and (D) out of which **ONLY ONE** is correct Choose the correct option.*

1. **Statement - I :** If a shopkeeper bought an article for Rs.560 and sold them at a gain of 25% thne the selling price is Rs.700

Statement - II : % of gain $= \left(\frac{gain}{C.P} X100\right)$

A) Both Statements are true, Statement II is the correct explanation of Statement I.

B) Both Statements are true, Statement II is not correct explanation of Statement I.

C) Statement I is true, Statement II is false.

D) Statement I is false, Statement II is true.

IV) Solve the following.

1. A pen is bought of Rs.12.40 and sold for Rs.13.60. Find the profit made?

2. An article bought for Rs.56 is sold at a gain of Rs.8.50. Find its selling price.

3. Find the selling price of an article that is bought for Rs. 540 and sold at a loss of Rs.68.50.

4. On selling a sofa-set for Rs.18,540, the manufacturer makes a loss of Rs.1,935. How much did it cost to the manufacturer?

5. Pens bought at 5 for Rs.60 are sold at 2 for Rs.30. Find

i) the cost price of each pen ii) the selling price of each pen

iii) the profit or loss made on selling one pen

iv) how much is gained or lost on selling 50 similar pens.

LEARNER'S TASK

BEGINNERS (LEVEL - I)

I) MCQ's with single correct answer :

1. The price at which an artilce is sold is caled_____
A) Selling price B) Cost price C) Expenses D) None

2. If CP=x, SP=y and y>x then y-x results to
A) Profit B) Loss C) No profit and loss D) None

3. A bicycle was purchased for Rs.1020 and sold for Rs.1500 the profit is
A) Rs.560 B) Rs.480 C) Rs.240 D) Rs.180

4. An article was bought for Rs.400 and sold for Rs.336. Find loss.
A) 18 B) 36 C) 24 D)64

5. Profit on article compared to '100' is known as _____
A) Profi B) Loss C) Profit percent D) loss percent

6. A dealer sold two TV sets for Rs 3700 each. on one he gained 10% and on other he lost 10%. The dealer's loss or gain percent is
A) 0% B) 0.1% loss C) 1% gain D) 1% loss

ACHIEVERS (LEVEL - II)

Solve the following:

1. Mr.Rohan bought an article for Rs.4750 and paid Rs.150 for its transportation. Due to scratches on it, he had to sell it for Rs.3540. Find his loss?

2. A shopkeeper buys three articles for Rs.375, Rs.580 and Rs.428 respectively. He is able to sell these articles for Rs.436 , Rs.635, Rs.350 respectively. Find the gain or loss to the shopkeepter on the whole.

3. Rajesh buys an old sofa-set for Rs.1,250 and spends Rs.350 on its repairs.
i) Find the total cost price of the sofa to Rajesh.
ii) Find the profit or the loss made if Rajesh is able to sell the repaired sofa-set for Rs.1,540.

4. A dealer buys a fan for Rs.680 and sells it for Rs.765. Find his gain and gain percentage.

5. Suraj purchased a refrigerator for Rs.16,275 and sold it at a 8%.For how much he sell the refrigerator.

6. A man bought an old car for Rs.1,25,000. He spent Rs.12,000 on repairs and Rs.3,000 on other things. He then sold the car for Rs.1,61,000. Find his gain percent.

7. Find C.P, when

(i) S.P-Rs.928, gain 16% (ii) S.P= Rs.12, loss=4%

(iii) S.P=Rs.324, gain =20% (iv) S.P=Rs.118,loss=10%

EXPLORER (LEVEL - III)

I) MCQ's with multi correct answer :

- *This section contains multiple choice questions. Each question has 4 choices (A), (B), (C),(D), out of which **ONE or MORE** is correct. Choose the correct options*

1. If table costing Rs.150 was sold for Rs.180 then which of the following is false?

A) 30% gain B) 20% gain C) 20% loss D) 15% loss

2. Gain % = ...

A) $\frac{gain}{C.P}X100$ B) $\frac{S.P-C.P}{C.P}X100$ C) $\left(\frac{S.P}{C.P}X100\right)-100$ D) $\left(\frac{S.P}{C.P}-1\right)X100$

II) Reasoning and Assertion type :

- *This section contains certain number of questions. Each question contains Statement – 1 (Assertion) and Statement – 2 (Reason). Each question has 4 choices (A), (B), (C) and (D) out of which **ONLY ONE** is correct Choose the correct option.*

Statement - I : If C.P = Rs.825.16 and loss is Rs.189.99 then S.P is Rs.635.17

Statement - II : If S.P = Rs.960 and gain is Rs.160 then gain % is 20%

A) Both Statements are true, Statement II is the correct explanation of Statement I.

B) Both Statements are true, Statement II is not correct explanation of Statement I.

C) Statement I is true, Statement II is false.

D) Statement I is false, Statement II is true.

III) Match the following :

- *This section contains Matrix-Match Type questions. Each question contains statements given in two columns which have to be matched. Statements (A, B, C, D) in **Column–I** have to be matched with statements (p, q, r, s) in **Column–II**. The answers to these questions have to be appropriately bubbled as illustrated in the following example.*

If the correct matches are A-p, A-s, B-q, B-r, C-p, C-q and D-s, then the correctly bubbled 4 × 4 matrix should be as follows.

Column - I	Column - II
a) Gain is possible if	1) S.P < C.P
b) Loss is possible if	2) S.P = C.P
c) Gain percent is possible if	3) S.P > C.P
d) Number of profit and no loss if	4) S.P - C.P < 0
	5) S.P - C.P > 0

A) a -3,5 , b - 1,4, c - 3,5 , d - 2. B) a -3 , b - 1,4, c -3 , d - 2,5
C) a -1,4 , b - 3,5, c - 2 , d - 3. D) a -4,5 , b - 2,3, c -1, d - 3

KEY

Φ Φ TEACHING TASK :

I) 1.A 2.C 3.B 4.C 5.B 6.B 7.B 8.D
II) 1.B 2.C **III)** 1.A

Φ Φ LEARNER'S TASK :

☐ **BEGINNERS : I)** 1.A 2.A 3.B 4.D 5.A 6.A
☐ **EXPLORERS : I)** 1.A,C,D 2.A,B,D **II)** 1.A **III)** 1.A

5.INTEREST

¶¶ Introduction:

Sometimes in need, we borrow money from a friend. We promise to return money after a specific period of time . At the end of the period, we have to pay the money borrowed and additional money for using lenders money.

The important terms are:

§§ **Principle :** The money borrowed is called principle.

§§ **Interest :** The additional money paid to borrower to the leader for having used his/her money is called 'Interest'.

§§ **Amount :** The total money paid back by the borrower to the lender is called 'Amount'.

Amount=Principle+interest

§§ **Rate :** Interest on Rs.100 for 1 year is called rate percent per annum.

§§ **Simple interst :** If the interest calculated uniformly on the original principle through out the loan period is called 'Simple Interest'.

$$\text{Simple Interest(S.I)} = \frac{P \times T \times R}{100}$$

Here, P=Principle R=Rate per annum T= Time in years

TEACHING TASK

I) MCQ's with single correct answer type :

1. If the principal is Rs.250 and Rate of interest is 4% per annum. Find the simple interest for 6 years.

A) Rs.20 B) Rs.30 C) Rs.40 D) Rs.60

2. A man borrowed Rs.8000 from a bank at 8% per annum. Find the amount he has to pay after $4\frac{1}{2}$ years?

A) Rs.10890 B) RS.10880 C) Rs.10980 D) Rs.10780

3. Calculate the simple interest on Rs.7200 at $12\frac{3}{4}$ % per annum for 9 months.

A) Rs.687.50 B) Rs. 686.50 C) Rs. 688.50 D) Rs. 689.50

4. How long will it take for sum of Rs.12,600 invested at 9% per annum simple interest to amount to Rs.15624

A) 2 yrs 8 months B) 2 yrs 6 months C) 2 yrs 7 months D) 2yrs 5months

5. What sum will yield an interest of Rs.277.50 in $2\frac{1}{2}$ years at $7\frac{1}{2}$ % per annum simple interest?

A) Rs.1450 B) Rs.1460 C) Rs. 1470 D) Rs.1480

II) MCQ's with multi correct Answer :

- *This section contains multiple choice questions. Each question has 4 choices (A), (B), (C),(D), out of which **ONE or MORE** is correct. Choose the correct options*

1. If a certain sum becomes 4 times itself in 16 years then the rate of interest is...

A) $18\frac{1}{4}\%$ B) $18\frac{1}{2}\%$ C) $18\frac{3}{4}\%$ D) $\frac{75}{4}\%$

2. If P = Rs.3000 R = 11% per annum and T = $2\frac{1}{3}$ yrs, then I =

A) Rs.770 B) Rs.700 C) Rs. 720 D) Rs.740

3. If P = Rs.7500, R = 16% per annum and T = 2 yrs 3 months, then A =

A) Rs.10020 B) Rs.10200 C) Rs.10420 D) Rs.12000

4. If P = Rs.6500 R = 6% and amount is Rs.7670 then T= ...

A) 4 yrs B) 3 yrs C) 5 yrs D) 2 yrs

III) Solve the following:

1. (a) P=Rs.45 T=3years R=5% find I?

(b) R=6.25% T=2years 3 months I=Rs.312.75. Find P ?

2. (a) P=Rs.6500 R=6% , A=Rs.7670. Find T ?

(b) P=Rs.1020 R=8% T=$3\frac{1}{3}$ %. Find A ?

3. Sheela deposited Rs.3,600 in a bank for 3 years. If the bank pays interest on this deposit at the rate of 10 percent per annum, find how much money will sheela get from the bank at the end of 3 years.

4. At what percent per annum will Rs.1650 amount to Rs.2046 in 3 years.

5. Shanta borrowed Rs.6000 from state bank of India for 3 years 8 months at 12% per annum. What amount will clear off her data?

KEY

ΦΦ TEACHING TASK:

I) 1.D 2.B 3.C 4.A 5.D

II) 1.C,D 2.A 3.B 4.B

LEARNER'S TASK

BEGINNERS (Level - I)

I) MCQ's with single correct answer :

1. $I=\frac{PTR}{100}$, P represents.

A) Interest B) Amount C) Principle D) Time

2. P=Rs.3200, N=3years,R=$2\frac{1}{2}$ % the S.I is

A) Rs.240 B) Rs.340 C) Rs.410 D) Rs.620

3. A man deposited Rs.4200 in bank. The bank gives 12% simple interest. After 1 year, how much interest does he get?

A) Rs.488 B)Rs.422 C) Rs.604 D) Rs.504

4. If P=200, T=2,I=8 and $I=\frac{PTR}{100}$ then R=____%

A) 1 B) 2 C) 3 D) 4

5. Let S.I=x and principle=y then the total amount payable

A) $\frac{x}{y}$ B) $\frac{y}{x}$ C) xy D) y+x

6. If P=1000, S.I=Rs.255 then A=?

A) Rs.000 B) Rs.1255 C) Rs.1025 D)Rs.005

7. Find the simple interest on Rs.500 for 8 months at 3 paise per rupee per month?

A) Rs.118.50 B) Rs. 120 C) Rs.118.75 D) Rs.125.25

8. At what rate percent on simple interest will Rs.750 amounts to Rs.950 in 5 years.

A) 5% B) $3\frac{1}{2}$ C) 4% D) $5\frac{1}{2}$%

9. At what rate percent on simple interest will a sum of money double itself in 30 years.

A) $3\frac{1}{3}$% B) $3\frac{1}{2}$% C) 4% D) $4\frac{1}{2}$%

10. In what time will the interest on Rs.350 amounts to Rs.49 at 7% per annum simple interest?

A) 6 yrs B) 5 yrs C) 4 yrs D) 2 yrs

ACHIEVERS (Level - II)

Solve the following :

1. Find the S.I and the amount on:

i) Rs.150 for 4 years at 5% per year.

ii) Rs.350 for $3\frac{1}{2}$ years at 8% p.a

iii) Rs. 3,380 for 30 months at $4\frac{1}{2}$% p.a

iv) Rs.225 for 3 years 9 months at 16% p.a

2. On what sum of money does the S.I for 10 years at 5% become Rs.1600?

3. Find the time in which Rs.2000 will amount to Rs.2,330 at 11% p.a?

KEY

ΦΦ LEARNER'S TASK:

☐ **BEGINNERS : I)** 1.C 2.A 3.D 4.B 5.D
6.B 7.B 8.C 9.A 10.D