

**Class: VI**  
**Subject: Mathematics**  
**Topic:**  
**No. of Questions: 30**  
**Duration: 90 Min**  
**Maximum Marks: 90**

- 1) Express  $\frac{27}{5}$  as a mixed fraction.

Sol. Quotient  $\frac{\text{remainder}}{\text{denominator}}$

$$\therefore \frac{27}{5} = 5 \frac{2}{5}$$

- 2) The number of lines of symmetry of the letter Z of the English Alphabet is?  
Sol. Z has no lines of symmetry (0)

- 3) Find the value of  $3\frac{5}{1000}$  ?

Sol.  $3 + \frac{5}{1000} = 3 + 0.005 = 3.005$

- 4) 12 men can finish a piece of work in 25 days. Find the number of days to do the same piece of work by 20 men?

Sol. Let the number of days required to do the same piece of work by 20 men be x days

We get :  $\frac{20}{15} = \frac{25}{x}$

$$x = 12 \times \frac{20}{52} = 15 \text{ days}$$

- 5) Find the cost of fencing a rectangular field 34 m long and 18 m wide at Rs 2.25 per metre?

Sol. Length of the rectangle = 34 m

Breadth of the rectangle = 18 m

Perimeter of the rectangle = 2 [length + breadth]

$$= 2 \times [34 + 18] = 104 \text{ m}$$

Cost of fencing the field at the rate of Rs 2.25 per metre = Rs  $104 \times 2.25$  = Rs 234

- 6) A collection of numbers gathered to give some information is called?.

Sol. Data is collection of numbers gathered to give some information.

- 7) The score of Ishita in Mathematics is 25 more than the two third of her score in Science. If she scored  $x$  marks in Science, determine her score in Mathematics.

Sol. Score in Science =  $x$

$$\Rightarrow \text{Two third of score in Science} = \frac{2}{3}x$$

$$\therefore \text{25 more than two third in Science} = \frac{2}{3}x + 25$$

$$\text{Hence, score in Mathematics} = \frac{2}{3}x + 25$$

- 8) What is the value of  $\frac{a+b}{a-b}$ , if  $\frac{a}{b} = 4$ ?

Sol.  $\frac{a}{b} = 4$

$$\Rightarrow a = 4b$$

On putting value of  $a$  in  $\frac{a+b}{a-b}$ , we get

$$\frac{a+b}{a-b} = \frac{4b+b}{4b-b} = \frac{5b}{3b}$$

On dividing the numerator & denominator by  $b$  we get  $\frac{5}{3}$

### Section B

- 9) Find the perimeter of a rectangle whose area is  $650 \text{ cm}^2$  and its breadth is  $13 \text{ cm}$ .

Sol. Area of the rectangle =  $650 \text{ cm}^2$

Breadth of the rectangle =  $13 \text{ cm}$

$$\text{Length of the rectangle} = \left( \frac{\text{Area}}{\text{Breadth}} \right) \text{ cm}$$

$$= \left(\frac{650}{13}\right) \text{ cm} = 50 \text{ cm}$$

Perimeter of the rectangle =  $2 \times (\text{Length} + \text{Breadth})$

$$= 2 \times (50 + 13) \text{ cm}$$

$$= 2 \times 63 \text{ cm} = 126 \text{ cm}$$

- 10)** A train covers a distance of  $D$  km in  $t$  hours. Express its speed in algebraic terms. Also, find the distance travelled by the train in  $6\frac{1}{2}$  hours, if it travels at speed of 60 km/hr.

Sol. Distance =  $d$  km

Time =  $t$  hours

$$\text{Speed} = \frac{\text{distance}}{\text{time}} = \frac{d}{t} \text{ km/hours}$$

Speed of the train = 60 km/hr

$$\text{Time} = 6\frac{1}{2} = \frac{13}{2} \text{ hours}$$

Distance = speed  $\times$  time

$$= 60 \times \frac{13}{2} = 390 \text{ km}$$

- 11)** Find the difference of  $\frac{17}{24}$  and  $\frac{15}{16}$

Sol. The L.C.M of 24 and 16 is 48

2	24, 16
2	12, 8
2	6, 2
	3, 2

So, we convert each fraction into an equivalent fraction with denominator 48.

We have,

$$\frac{17}{24} = \frac{17 \times 2}{24 \times 2} = \frac{34}{48} \text{ and } \frac{15}{16} = \frac{15 \times 3}{16 \times 3} = \frac{45}{48}$$

Clearly,  $\frac{45}{48} > \frac{34}{48}$  i.e.  $\frac{15}{16} > \frac{17}{24}$

Hence, Difference =  $\frac{15}{16} - \frac{17}{24} = \frac{45}{48} - \frac{34}{48} = \frac{45-34}{48} = \frac{11}{48}$

- 12) The following are the number of electric bulbs purchased for a lodging house during the first four month of a year.

Months	Number of bulbs
January	20
February	26
March	30
April	34

Represent the details by a pictograph.

Sol:



- 13) Ravi purchased 5Kg 400 g rice, 2Kg 20 g sugar and 10 kg 850g wheat. Find total weight of his purchases.

Sol. We have,

Quantity of Rice purchased = 5 kg 400 g = 5.400 kg

Quantity of Sugar purchased = 2 kg 20 g = 2.020 kg

Quantity of Wheat purchased = 10 kg 850 g = 10.850 kg

∴ Total weight of his purchases is = (5.400 + 2.020 + 10.850)kg = 18.270kg

- 14)** The ratio of the length of a school ground to its width is 5 : 2. Find the length if the width of the ground is 50 m

Sol. Let the length of the school ground be  $x$  metres.

Then, the ratio of the length to the width =  $x : 50$

But, the ratio of the length of the school ground to its width is given as 5 : 2

$$\therefore x : 50 = 5 : 2$$

$$\Rightarrow x \times 2 = 50 \times 5$$

$$\Rightarrow 2x = 250$$

$$\Rightarrow x = \frac{250}{2} = 125$$

Hence, the length of school playground is 125 m

### Section

- 15)** Find the perimeter of a rectangular field whose length is four times its width and which has an area equal to  $30976 \text{ cm}^2$ .

Sol. Let the width of the field  $b$  cm. then,

Length of the field =  $4b$  cm

$$\therefore \text{Area of the field} = (b \times 4b) \text{ cm}^2 = 4b^2 \text{ cm}^2$$

But, area of the field is given as  $30976 \text{ cm}^2$

$$\therefore 4b^2 = 30976$$

$$\Rightarrow b^2 = \frac{30976}{4} = 7744$$

$$\Rightarrow b^2 = (88)^2 \Rightarrow b = 88$$

$$\therefore \text{Length of the field} = 4b = (4 \times 88) \text{ cm} = 352 \text{ cm}$$

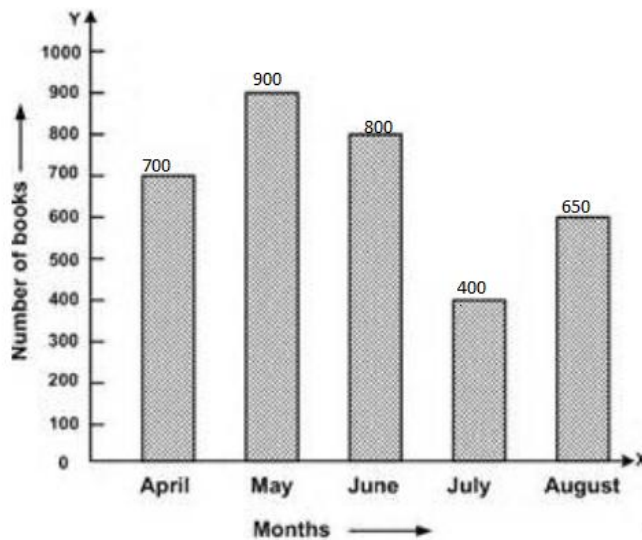
Width of the field =  $b$  cm = 88 cm

Hence, Perimeter of the field =  $2(\text{Length} + \text{Breadth})$

$$= 2(352 + 88) \text{ cm} = 880 \text{ cm}$$

16) Read the following Bar Graph in Fig., and answer the following questions:

- (I) What is the information given by the bar graph?
- (II) In which month was the sale of the book is maximum and minimum?
- (III) What is the total sale of the book during these five months



[Bar graph showing the number of copies of Mathematics for Class XII, sold by a book-seller during the five months 2000]

Sol. (I) The Bar graph shows the number of copies of Mathematics for XII sold by a bookseller during the period from April 2000 to August 2000

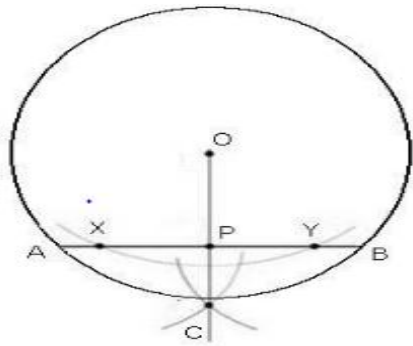
(II) the sale of book was maximum in the month of May and minimum in the month of July

(III) total sale of the book during 5 months

$$(700 + 900 + 800 + 400 + 650) = 3450$$

17) Draw a circle of any radius and a chord AB in it. Construct a perpendicular from centre to the chord. Does this perpendicular divide the chord in equal parts?

Sol.



Steps of construction:

1. Draw a circle with centre O and any radius and make a chord AB.
2. Taking O as a centre and a suitable radius, draw an arc which cut the chord AB at two points X and Y.
3. Taking X and Y as centre and same radius draw two arcs and let them intersect at C.
4. Join OC; name the point of intersection of AB and OC as P.

Measure AP and PB, we find that  $AP = PB$ .

Hence, the perpendicular from centre divides the chord in two equal parts

- 18)** Find the ratio of the price to that of tea, when coffee costs Rs 24 per 100 gm. and the tea costs Rs 80 per Kg.

Sol. We have ,

Cost of 100 gm. of coffee = Rs 24

$$\Rightarrow \text{cost of 1 gm. of coffee} = \text{Rs} \left( \frac{24}{100} \right)$$

$$\Rightarrow \text{Cost of 1000gm. of coffee} = \text{Rs} \left( \frac{24}{100} \times 1000 \right) = \text{Rs } 240$$

$$\therefore \text{Cost of 1kg of coffee} = \text{Rs } 240 \quad [ \because 1\text{kg} = 1000\text{gm} ]$$

It is given that the cost of 1kg of tea is Rs 80

$$\therefore \text{Price of coffee to the price of tea} = \text{cost of 1kg of coffee} : \text{Cost of 1kg of tea}$$

$$= \text{Rs } 240 : \text{Rs } 80$$

$$= 3 : 1$$

[Dividing the first and second term

by their H.C.F = 80]

19) Rohan spends Rs x daily and saves Rs y per week. What is his income after 3 weeks?

Sol. We have,

$$1 \text{ week} = 7 \text{ days}$$

$$\therefore 3 \text{ weeks} = (7 \times 3) \text{ days} = 21 \text{ days}$$

Rohan spends Rs x daily

$$\begin{aligned} \therefore \text{Amount spent by Rohan in 3 weeks (21 days)} &= \text{Rs (21 times } x) \\ &= \text{Rs } 21x \end{aligned}$$

Rohan saves Rs y per week

$$\begin{aligned} \therefore \text{Amount saved by Rohan in 3 weeks} &= \text{Rs (3 times } y) \\ &= \text{Rs } 3y \end{aligned}$$

Now,

Income = Expenditure + Savings

$$\begin{aligned} \therefore \text{Rohan's income after 3 weeks} &= \text{sum of Rs } 21x \text{ and } 3y \\ &= \text{Rs } (21x + 3y) \end{aligned}$$

20) Tanvi bought a notebook for Rs  $8\frac{3}{4}$  and a pen for Rs  $10\frac{2}{5}$ . How much money should she pay to the shopkeeper

$$\text{Sol. Cost of notebook} = \text{Rs } 8\frac{3}{4} = \text{Rs } \frac{(8 \times 4) + 3}{4} = \frac{35}{4}$$

$$\text{Cost of pen} = \text{Rs } 10\frac{2}{5} = \text{Rs } \frac{(10 \times 5) + 2}{5} = \frac{52}{5}$$

$$\text{L.C.M of 4 and 5} = (2 \times 2 \times 5) = 20$$

Total cost of both the items =

$$= \text{Rs } \left( \frac{35}{4} + \frac{52}{5} \right)$$

$$= \text{Rs } \left( \frac{35 \times 4}{20} + \frac{52 \times 4}{20} \right)$$

$$= \text{Rs } \left( \frac{175}{20} + \frac{208}{20} \right)$$



$$= \text{Rs } \left( \frac{383}{20} \right)$$

$$= \text{Rs } 19 \frac{3}{20}$$

- 21)** A taxi driver filled his petrol tank with 40 litres of petrol on Monday. The next day, he filled the tank with 50 litres of petrol. If the petrol costs Rs 44 per litre, how much did he spend in all on petrol?

Sol. Petrol filled on Monday = 40 litres

Petrol filled on Tuesday (next day) = 50 litres

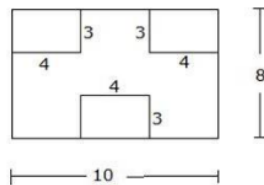
Total Petrol filled in both the days = 40 + 50 = 90 litres

Cost of petrol = Rs 44 per litre

Cost of 90 litres of petrol = 90 × 44 = Rs 3960

Hence, the taxi driver spent Rs 3960 in all on petrol

- 22)** Three rectangles of dimensions 4 m x 3 m are removed from a large rectangle of dimensions 10 m x 8 m. Find the area of the remaining part?



Sol. Since from the figure the smaller rectangles are equal.

Therefore,

Area of one smaller rectangle = length x breadth

$$= 3 \times 4$$

$$= 12 \text{ sq. m}$$

Area of 3 smaller rectangles = 3 × 12

$$= 36 \text{ sq. m}$$

Area of bigger rectangle = length x breadth

$$= 10 \times 8$$

$$= 80 \text{ sq. m}$$

Therefore, area of remaining part =  $80 - 36$

$$= 44 \text{ sq. m}$$

#### SECTION D

**23)** A car travels 165 km in 3 hours

(I) how long will it take to travel 440 km?

(II) How far will it travel in  $6\frac{1}{2}$  hours?

Sol. (I) to travel 165km , time taken by the car = 3 hours

$$\therefore \text{to travel 1km, time taken by the car} = \frac{3}{165} \text{ hours}$$

$$\text{Hence, to travel 440km, time taken by the car} = \left(\frac{3}{165} \times 440\right) \text{ hours}$$

$$= 8 \text{ hours}$$

Thus, the car takes 8hours to travel 440 km

(II) Distance travelled in 3 hours = 165 km

$$\therefore \text{Distance travelled in 1 hour} = \frac{165}{3} \text{ km}$$

Hence, distance travelled in  $6\frac{1}{2}$  hours, i.e.,  $\frac{13}{2}$  hours

$$= \frac{165}{3} \times \frac{13}{2} \text{ km} = \frac{715}{2} \text{ km} = 357.5 \text{ km}$$

Thus, the car travels 357.5km in  $6\frac{1}{2}$ hours

**24)** The final marks in mathematics of 30 students are as follows:

53, 61, 48, 60, 78, 68, 55, 100, 67, 90

75, 88, 77, 37, 84, 58, 60, 48, 62, 56

44, 58, 52, 64, 98, 59, 70, 39, 50, 60

(I) Arrange these marks in ascending order 30 to 39 in one group, 40 to 49 second group etc

(II) What is the range?

(III) If 40 is the pass mark how many have failed?

(IV) how many have scored 75 or more?

Sol. (I) frequency distribution of the given marks in mathematics of 30 students

30 - 39	37, 39
40 - 49	44, 48, 48
50 - 59	50, 52, 53, 55, 56, 58, 58, 59
60 - 69	60, 60, 60, 61, 62, 64, 67, 68
70 - 79	70, 75, 77, 78
80 - 89	84, 88
90 - 99	90, 98
100 - 109	100

(II) range = Highest score – lowest score

$$= 100 - 37 = 63$$

(III) If 40 is the pass marks, students who have scored less than 40 have failed. So, the students

Who have scored 37 and 39 have failed

∴ number of students that have failed in the exam = 2

(IV) Students who have scored 75, 77, 78, 84, 88, 90, 98 and 100 are the ones to score more than

75

∴ number of students who scored 75 or more = 8

**25) What will happen to the area of a square if its side is (i) doubled (ii) halved?**

Sol. Let the side of a square be  $x$  cm. then,

$$\text{Area} = A = x \times x \text{ cm}^2$$

(i) when the side is doubles. Then,

Sides of the new square =  $2x$  cm

$$A_1 = \text{area of the new square} = 2x \times 2x \text{ cm}^2$$

$$= 4 (x \times x) \text{ cm}^2$$

$$= 4 A$$

Thus, if the side is doubled, then area becomes 4 times

(ii) When the side is halved. Then,

$A_2$  = area of the new square

$$= \left(\frac{x}{2} \times \frac{x}{2}\right) \text{ cm}$$

$$= \frac{1}{4} x \times x$$

$$= \frac{1}{4} A$$

Thus, if the side is halved, then area becomes one-fourth

**26)** Balu is  $x$  years old. His father's age is 5 more than times his age. The sum of their ages is 55 years. Find Balu's father's age.

Sol. Given that Balu is  $x$  years old

4 times Balu's age  $x$  years

Given that Balu's father's age is 5 more than  $4x$

Hence Balu's father's age =  $4x + 5$

Sum of Balu and his father's age = 55 years

$$\therefore x + (4x + 5) = 55$$

$$\Rightarrow 5x = 55 - 5 = 50$$

$$\Rightarrow x = \frac{50}{5} = 10$$

Balu's father's age  $4x + 5 = 4(10) + 5 = 40 + 5 = 45$

Hence Balu's father's age = 45 years