Figures in the margin indicate full marks of the questions. Answer the questions as directed after mentioning the proper question number.

Group – A

1. <u>Multiple Choice questions:</u>

(i) Hema had $\frac{5}{8}$ kg. of tea. She repacked the tea into bags of $\frac{5}{32}$ kg. each. How many bags of tea did Hema get?

(a) 4.

(ii) $(\frac{9}{11})^0$ is equal to

(b) 1

(iii) $\sqrt[3]{216}$ = _____

(c) 6

(iv) Which of the following ratio is the largest?

(d) 2 : 3.

(v) A car runs 300 km. on 25 litres of petrol. How many kilometres will it run on 18 litres of petrol?

(c) 216 km

2. Write *True or False*:

(i) $\frac{93}{451}$ is an improper fraction. *False*

(ii) A negative rational number raised to an even power is positive. *True*

(iii) Distance = $\frac{Time}{Speed}$. *False*

(iv) Side of a square = $\sqrt{Area}$. *True*

(v) Pie chart is tabular representation of data. *False*

3. <u>Fill in the blank:</u>

(i) The reciprocal of $(- 3)^4$ is $(\frac{-1}{3})^4$

(ii) $\sqrt{\frac{9}{64}} = \frac{3}{8}$

(iii) The simplest form of 18 : 24 is 3:4.

(iv) 25% of 64 = 16.

(v) 72 km./h = 20 m/s.

4. Match the column:

i	$\frac{4}{10}$	e	Decimal fraction
ii	$(\frac{p}{q})^n$	a	$\frac{p^n}{q^n}$
iii	$\sqrt[3]{64}$	b	4
iv	a : b :: b : c	c	$b^2 = ac$
v	Volume and density variation	d	Inverse variation.

5. Write 'Yes' or 'No':

 (i) Since ratio is a number, it has no units. *Yes*

(ii) In a proportion a : b :: b : c, b is called mean proportional. *Yes*

(iii) Percentage decrease = $(\frac{Decrease\ in\ value}{Original\ value} \times 100)\%$ *Yes*

(iv) Speed = $\frac{Distance}{Time}$ *Yes*

(v) In a given data, the number of times a particular observation occurs is called its frequency. *Yes*

Group – B

5.

(i) Find the value $\frac{7}{15}$ of rs 750.

₹750 $\times \frac{7}{15}$ = ₹350

(ii) Express $(-7^2)^{5} \times (-7^4)^2$ with a single exponent.

$(-7)^{10} \times (-7)^8 = (-7)^{18}$

(iii) If a:b=2:3 and b:c= 4:5 .Find a:b:c.

$\frac{a}{b} = \frac{2}{3}$ and $\frac{b}{c} = \frac{4}{5}$

$\therefore \frac{a}{b} = \frac{2 \times 4}{3 \times 4} = \frac{8}{12}; \frac{b}{c} = \frac{4 \times 3}{5 \times 3} = \frac{12}{15}$

$\therefore$ a: b: c = 8:12: 15.

(iv) The weight of 45 books is 9 kg. What is the weight of 80 books.

45	books	weight	9 kg
1	book	weight	$\frac{9}{45}$ kg
80	books	weight	$\frac{9}{45} \times 80$ = 16 kg.

(v) Find the value when 125 is increased by 50%.

125 $\times \frac{50}{100} = \frac{625}{10}$ = 62.5; $\therefore$ New value (125 + 62.5) = 187.50.

6.

(i) The speed of a car is 15m/s . How far does it travel in 6 hours?

The distance travelled by the car = $(15 \times \frac{18}{5}) \times 6$ = 324 km.

(ii) Following are the ages of 10 students in a school-40,35,39,50,42,38,29,48,26,56.Find the mean age.

Sum of the ages = 403; $\therefore$ mean age = $\frac{403}{10}$ = 40.3 years.

(iii) A rectangular water tank is 5m high,3 m long and 2 m wide. How much water can it hold?

Volume of the water tank = $(5 \times 3 \times 2)$ m^3 = 30 m^3.

(iv) Find the reciprocal of $[(\frac{1}{3})^{-3} - (\frac{1}{2})^{-3}] \div (\frac{1}{4})^{-3}$

$(27 - 8) \div (4)^3 = \frac{19}{64}$; $\therefore$ Reciprocal is $\frac{64}{19}$

(v) A wrist watch was purchased for Rs 2000 and sold for Rs 1800.Find loss and loss percent.

Loss = ₹(2000 − 1800) = ₹200; $\therefore$ Loss % = $\frac{200}{2000}$ x 100 = 10%

(vi) A boy obtained 88% marks out of 500 marks. How many marks did he get?

The boy obtained : 88% of 500 = $\frac{88}{100} \times 500$ = 440.

(vii) The distance around the field is 540 m. Vijay runs around the field 8 times in half an hour. What is the average speed in m/s?

Distance covered by Vijay = (540×8) m = 4320 m; Time = (30×60) sec.s = 1800 sec.s

In	1800	seconds	he	covers	4320 m
In	1	second	he	covers	$\frac{4320}{1800}$ = 2.4m/second.

Group – C

8.

(i) Divide ₹1250 among A, B and C so that A gets $\frac{2}{9}$ of B's share and C gets $\frac{3}{4}$ of A's share.

Let the ratio of the three parts be A: B: C

$A = \frac{2}{9} B$; $\frac{A}{B} = \frac{2}{9}$; A:B = 2:9

$C = \frac{3}{4} A = \frac{3}{4} \times \frac{2}{9} B = \frac{1}{6} B$

$\therefore \frac{C}{B} = \frac{1}{6}$; B:C = 6:1.

Given A:B= 2: 9 and B:C =6:1

Now, making B equal in both the cases,

A:B =2:9=4:18 and B:C= 6:1=18:3; $\therefore$ A:B:C=4:18:3

Sum of the terms of the ratio = 4+18+3=25

$\therefore$ A's share = $\frac{4}{25} \times 1250 = ₹200$

B's share = $\frac{18}{25} \times 1250 = ₹900$

C's share = $\frac{3}{25} \times 1250 = ₹150$

(ii) Find the third proportional to 3.6 and 1.8.

Let the third proportional to 3.6 and 1.8 be x.

$\therefore$ 3.6: 1.8 :: 1.8: x

Or, $\frac{3.6}{1.8} = \frac{1.8}{x}$

Or, x = $\frac{1.8 \times 1.8}{3.6} = \frac{9}{10} = 0.9$

(iii) A and B together can do a piece of a work in 5 days, but A alone can do it in 10 days. How many days would B alone take to do the same work?

In 1 day A and B together can do $\frac{1}{5}$th of the work.

In 1day A alone can do $\frac{1}{10}$th of the total work

$\therefore$ In 1 day B alone can do $(\frac{1}{5} - \frac{1}{10})$ of the work i.e. $\frac{1}{10}$th of the total work.

So, B alone can do the work in $(1 \div \frac{1}{10})$ i.e. 10 days.

(iv) An explosive material contains 75% nitre and 10% sulphur. The rest of it is charcoal. Find the amount of charcoal in 9 kg. of the explosive material.

Amount of nitre in a kg of explosive material = 75% of 9 kg of explosive material = 6.75 kg.

Amount of sulphur in 9 kg of explosive material = 10% of 9 kg. = 0.9 kg.

$\therefore$ Charcoal = 9 – (6.75 + 0.90)kg = 9 – 7.65 = 1.35 kg.

OR

A bank deposit has increased by 50% during the past year. It is now ₹60300. What was it a year ago?

Amount of bank deposit before 1 year = ₹60300 $\times \frac{100}{150} = ₹40200$.

(v) Rishi during his journey, travels for 20 minutes at a speed of 30 km/h, another 30 minutes at a speed of 50 km/hr, 1 hour at a speed of 60km/hr. What is his average speed?

Distance travelled in first 20 minutes = $(30 \times \frac{20}{60}) = 10$ km

Distance travelled in next 30 minutes = $(50 \times \frac{30}{60}) = 25$ km

Distance travelled in next 1 hour = $(50 \times 1) = 50$ km

3

Distance travelled in last 1 hour = (60 × 1) = 60 km

∴ Total distance travelled = 10+25+50+60=145KM

Total time taken = 20+30+60+60=170 minutes = $\frac{170}{60}$ hours = $\frac{17}{6}$ hrs.

∴ Average Speed = $\frac{145 \times 6}{17}$ km/h= 51.18km/h.

(vi) A room measure 12m × 9m. The floor of the room is to be covered by marble tiles measuring 45 cm by 30 cm. How many tiles are required?

Number of tiles needed $= \frac{Area\ of\ the\ floor}{Area\ of\ one\ tile} = \frac{12 \times 9}{\frac{45}{100} \times \frac{3}{10}} = \frac{12 \times 9 \times 100 \times 10}{45 \times 3} = 800$

(vii) The heights in cm of 50 boys are given below. Find the mean height.

Height	155	156	157	158	159	160
Frequency	4	15	8	6	12	5

Height (x)	Frequency (f)	fx
155	4	155×4= 620
156	15	156×15= 2340
157	8	157×8= 1256
158	6	158×6= 948
159	12	159×12= 1908
160	5	160× 5= 800
	εf= 50=N	εfx= 7872

Mean = $\bar{x} = \frac{\varepsilon fx}{\varepsilon f} = \frac{7872}{50}$ = 157.44cm.

OR

The following table shows the votes received by the students who stood for the election of class monitor:

Name	Aman	Shreyash	Suman	Mahi	Soumya
Number of votes	2	4	6	5	1

Draw a pie chart to represent the above information.

Table for Pie Chart

Name	Aman	Shreyash	Suman	Mahi	Soumya
Number of votes	2	4	6	5	1
Measure of the central angle	$\frac{2}{20} \times 360^0$ =36^0	$\frac{4}{20} \times 360^0$ =72^0	$\frac{6}{20} \times 360^0$ =108^0	$\frac{5}{20} \times 360^0$ =90^0	$\frac{3}{20} \times 360^0$ =54^0

Draw a pie chart with the help of above data.

(viii) A hall has dimensions 34m × 24m × 8m. Find the cost of white washing the four walls at the rate of ₹10 per m^2.

Given l = 34m; b= 24m; and h= 8m

∴ Area of 4 walls = 2 (l + b) h

$= 2(34+24) \times 8= (58 \times 16)m^2 = 928\ m^2$

∴ Cost of white washing the four walls @ ₹10 per m^2 = 928 × ₹10 = ₹9280.