

Q6 (a)

Initial population = 18000
population after 10 years = 22,500

$$\% \text{ age increase} = \frac{\text{final population} - \text{initial population}}{\text{initial population}} \times 100$$

$$= \frac{22500 - 18000}{18000} \times 100$$

$$= \frac{4500}{18000} \times 100$$

$$= \frac{5 \cdot 45}{1 \cdot 180} \times \frac{100}{100}$$

$$= 25\%$$

Increase in population after 10 years = 25%

$$\text{Increase in population per year} = \frac{25\%}{10}$$

$$= 2.5\%$$

Thus %age of population increase per year was 2.5%.

Q6 (b)

Units	Days	Machines
↑ 600	↑ 9	↑ 20
x	12	18

$$\frac{x}{600} = \frac{9 \cdot 12}{39} \times \frac{18}{20}$$

$$x = \frac{4}{13} \times \frac{9}{10} \times 600$$

$$x = 720 \text{ units}$$

So 720 units will be made in 12 days with 18 machines.

Q6 (c)

Distance by car, $d_1 = 450 \text{ m}$
time by car, $t_1 = 1 \text{ min} = 60 \text{ s}$

$$\text{speed of car, } v_1 = \frac{d_1}{t_1} = \frac{450}{60}$$

$$v_1 = \frac{15}{2} \text{ m/s}$$

Distance by train, $d_2 = 69 \text{ km} = 69000 \text{ m}$
time by train, $t_2 = 45 \text{ min} = 2700 \text{ s}$

$$\text{speed of train, } v_2 = \frac{d_2}{t_2} = \frac{69000}{2700}$$

$$v_2 = \frac{130}{9} \text{ m/s}$$

$$\text{Ratio} = \frac{v_1}{v_2} = \frac{15}{2} / \frac{130}{9}$$

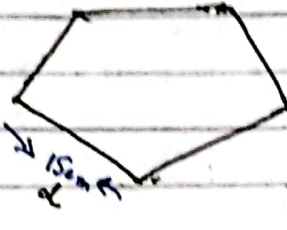
$$= \frac{3 \times 15}{2} \times \frac{9}{130}$$

$$\text{Ratio of speeds} = \frac{27}{52}$$

Q6 (d)

length of one
side of pentagon $d = 15\text{cm}$

perimeter of pentagon $= 5d$



putting value of d in above equation

perimeter of pentagon $= 5 \times 15\text{ cm}$

perimeter of pentagon $= 75\text{ cm}$

$= 0.75\text{ m}$

Q7 (a)

Intelligence Quotient (I.Q)

Definition :

I.Q is a score used to quantify a person's level of intelligence based on standardized tests.

It is a measure of ~~gross~~ cognitive abilities such as reasoning, problem solving and comprehension.

Factors that affect I.Q

1. Genetics

Estimates suggests that 40 to 80% of variability in IQ

is related to genetic makeup a person inherits.

2- Place of Residence

Children living in cities tend to have more I.Q.

3- Physical activity

Children who have physical activity of more than 5 hours in week tend to have more I.Q.

4- Family Income

Higher family income is associated with higher I.Q.

5- Parental education

Children of highly educated parents tend to have higher IQ.

6- Cognitive Stimulation at home

The quality and quantity of cognitive stimulation a child receives impacts his I.Q.

7- Nutrition

Malnutrition can reduce I.Q. by 15% in childhood.

8- School education

The quality of education a child receives influences his I.Q.

9- Socioeconomic Status (SES)

Higher SES is associated with higher heritability of I.Q. and vice versa.

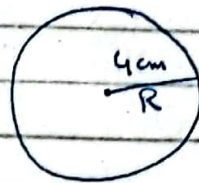
In short, genetic factors and a wide range of environmental factors from socioeconomic status to nutrition play important roles in determining a person's I.Q.

Relative influence of genes versus environment varies based on factors like age and socioeconomic status.

Q7 (b)

Radius of circle, $R = 4\text{cm}$

Circumference of circle, $C = ?$



$$\text{Circumference of circle} = 2\pi R \quad \text{--- (1)}$$

Putting value of R in above eq

$$\text{Circumference of circle} = 2 \times \frac{22}{7} \times 4$$

$$c = \frac{176}{7} \text{ cm} = \frac{176}{7 \times 100} \text{ m}$$

$$\text{Circumference of circle } c = \frac{176}{700} \text{ m}$$

Q7 (c)

Age of 5 students = 20, 21, 21, 22, 23
in ascending order

$$\text{i) Mean} = \frac{\text{Sum of 5 terms}}{\text{Total number of terms}}$$

$$= \frac{20 + 21 + 21 + 22 + 23}{5}$$

$$= \frac{107}{5} = 21.4$$

$$\text{Mean} = 21.4$$

ii) Median

Median is the middle term in orderly arranged data.

Given data is

20 , 21 , 21 , 22 , 23

$$\text{Median} = \left(\frac{n+1}{2}\right) \text{th term}$$

$$= \left(\frac{5+1}{2}\right) = \left(\frac{6}{2}\right) \text{th term}$$

$$= 3 \text{rd term}$$

$$\text{Median} = 21$$

c- Mode ^{most}
Mode is the ~~term~~ repeated term

which is 21 as it occurs
most repeatedly i.e. 2 time so

$$\boxed{\text{Mode} = 21}$$

d- Range

$$\begin{aligned}\text{Range} &= \text{highest term} - \text{lowest term} \\ &= 23 - 20\end{aligned}$$

$$\boxed{\text{Range} = 3}$$

Q7 (d)

$$\text{Profit } P = 406000 \text{ Rs} \quad \text{--- (1)}$$

$$\text{Profit share of Tahir} = 15000 \times 12 \times x$$

$$\text{Profit share of Umar} = 30000 \times 7 \times x$$

$$\text{Profit share of Usman} = 45000 \times 4 \times x$$

Ratio of profit share for Tahir,
Umar, and Usman

$$15000 \times 12x : 30000 \times 7x : 45000 \times 4x$$

$$12x : 14x : 12x$$

$$\text{total profit} = 12x + 14x + 12x = 38x \quad \text{--- (2)}$$

putting value of profit from Eq (1)

$$406000 = 38x$$

$$x = \frac{203000}{38 \cdot 19} = \frac{203000}{19} \quad \text{--- (3)}$$

Share of Profit of Tahiz = $12x$,

putting value of x from Eq (3)

$$\begin{aligned} \text{profit of Tahiz} &= \frac{12 \times 203000}{19} \\ &= \frac{2436000}{19} \text{ Rs} \end{aligned}$$

Profit of Umar = $14x$

$$\begin{aligned} &= 14 \times \frac{203000}{19} \\ &= \frac{2842000}{19} \text{ Rs} \end{aligned}$$

Profit of Usman = $12x$

$$\begin{aligned} &= \frac{12 \times 203000}{19} \\ &= \frac{2436000}{19} \text{ Rs} \end{aligned}$$