Define and draw the following: **(2½ each)** **(5)**

(i) Rightangle triangles (ii) Equilateral triangles

There are nine students in a group having ages 15, 15, 16, 16, 16, 17, 17, 18, 19. Calculate ***mean***, ***medium***, ***mode*** and ***range*** of their ages also define the above mentioned terms: **(5)**

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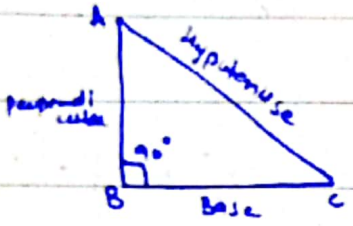
Q.No.1 (a) Define and draw following

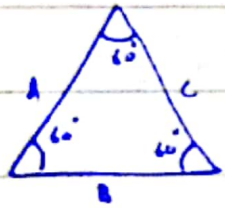
(i) Rightangle triangle

A triangle in which one angle is a right angle (=90°), in which two sides are perpendicular is called right angle triangle.



(ii) Equilateral triangle

A triangle in which all sides are equal, or all angles are equal is called equilateral triangle.



A=B=C

(b) Mean, median, mode, range

d) mean

Given data 15, 15, 16, 16, 16, 17, 17, 18, 19

Formula:

$$\text{mean} = \frac{\text{Total observation's sum}}{\text{Total number of observations}}$$

$$\bar{X} = \frac{\Sigma X}{n}$$

$$\text{mean} = \frac{15+15+16+16+16+17+17+18+19}{9}$$

$= \frac{149}{9}$

mean $= \boxed{16.55}$

(ii) Median

It is middle value of a given dataset which divides the dataset, in two equal halves.

15, 15, 16, 16, (16) 17, 17, 18, 19

Data set should be in arrangement (order)

Median $= \boxed{16}$

(iii) Mode

It is the most repetitive value of a given data set.

For the given data set,

mode $= \boxed{16}$

It is repeated three times.

(iv) Range

It is difference of maximum and minimum value of a given dataset.

Formula:

Range = Maximum Value - Minimum Value

$= 19 - 15$

$= \boxed{4}$

a) **A distribution company provides households to departmental stores within a 50 kilometers radius. The table below shows how far each departmental store is from the godown of the distribution company.** **(5)**

Distance from the godown of the distribution company	Number of Stores
10 kilometers or less	03
11 to 20 kilometers	15
21 to 30 kilometers	26
31 to 40 kilometers	20
41 to 50 kilometers	16

(i) How many stores does the distribution company serve?
(ii) What is the most common distance of stores from the company's godown?
(iii) How many stores are 35 Km or more from the godown?
(iv) What percentage of stores are 31 Km or more from the godown?

b) Read the following carefully and answer the questions following: **(5)**

Ahmad, Ali, Akbar, Nasir and Shehbaz are students of a college having different heights and weights. Ahmad weighs thrice as much as Ali and Ali weighs 5 times as much as Akbar. Akbar weighs half as much as Nasir and Nasir weighs half as much as Shehbaz.

(i) Who is the heaviest in weight?
(ii) Who is the is the lightest in weight?
(iii) Shehbaz is lighter in weight than which of the two students?
(iv) Shehbaz is heavier than which of the two students?
(v) Show the descending order of weights of the students?

Q.No.2 (a)

(i) stores, the company serve

Total number of stores = 3+15+26+20+16

= **80**

(ii) most common distance of stores from company

Most common distance, in which maximum number of stores are present, is

21 to 30 kilometers

(iii) Stores that are 35km or more from godown

stores that are present in a distance of 35km or more from godown are

= 20 + 16

= **36**

(iv) percentage of stores of 31km or more

No. of stores that are 31 km or more from godown = 36

Total Number of stores = 80

Formula: percentage = $\frac{\text{given stores}}{\text{total stores}} \times 100$

$= \frac{36}{80} \times 100$

= **45%**

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(b) Let suppose

weight of Akbar = x

Nasir's weight is double of Akbar's weight = 2x

Shehbaz's weight is double of Nasir = 4x

Ali's weight is 5 times of Akbar = 5x

Ahmad's weight is thrise of Ali = 15x

(i) heaviest in weight

Ahmad

(ii) lightest weight

Akbar

(iii) Shehbaz is lighter in weight than

Ali and Ahmad

(iv) Shehbaz is heavier than

Nasir and Akbar

(v) descending order of weight

Ahmad > Ali > Shehbaz > Nasir > Akbar

Classification of blood groups is based on the presence or absence of inherited antigenic substances on the surface of red blood cells. In a survey of British population the blood group distribution among 1000 people was as follows: 300 had blood group A, 325 had blood group B, 250 had O and 125 AB. Out of this group a person was selected at random, calculate his probability of having blood group AB **(5)**

Five friends Ahmad, Ali, Akbar, Nasir and Shehbaz went on summer vacation to five cities namely V, W, X, Y and Z by five different modes of transport, that is by bus, train, aeroplane, car and boat from point A. Akbar went to Y by car and Ali went to X by air. Nasir travelled by boat whereas Shehbaz went by train. For X and W there is no bus service. The person who went to X did not use boat to travel. Now answer the following questions. **(5)**

(i) How did Ahmad travel and where did he go?

(ii) Which mode of transport was used by the person who travelled to X city?

Q. No. 3. (a)

Total number of people = 1000

people with blood group A = 300

people with blood group B = 325

people with blood group O = 250

people with blood group AB = 125

probability of a randomly chosen person, to have blood group AB

Formula:

$$\text{probability}_{(AB)} = \frac{\text{Numbers of ways of occurance of an event}}{\text{Total possible outcomes}}$$

$$= \frac{125}{1000}$$

$$= \frac{25}{200}$$

$$= \boxed{\frac{1}{8}}$$

(b) let's breakdown the statement

From the statement it is clear that

- Ali used aeroplane to go to X
- Akbar used car to go to Y
- Shahbaz used train

To reach W, boat and Bus are not available options, so the only option is train, means that

- Shahbaz used train to reach W

(i) how did Ahmad travelled and where?

Available destination for Ali are,

$\boxed{V \text{ or } Z}$

Available mode of transport is $\boxed{\text{Bus}}$, as boat is used by Nasir.

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(iii) mode of transport used by person who travelled to X city

It is clear from the given statement.

Ali used Aeroplane to reach X. city

Differentiate between primary and secondary mental abilities. How the general mental ability scales differ from IQ test. **(5)**

$Y = mX + C$ is an equation of straight line. Draw a graph showing relationship between X and Y and relate the equation to the slope and intercept on the graph. **(5)**

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Q.NO.4 (a) Differentiate primary and secondary mental abilities. How the general mental scales differ from IQ tests.

1- primary mental abilities

Mental abilities are concepts proposed by psychologist Thurstone.

primary mental abilities refer to specific relatively independent mental skills that contribute to overall intelligence. There are seven primary mental abilities:

(i) Verbal comprehension is the ability to understand and use words effectively.

(ii) Numerical ability is the capacity for mathematical reasoning.

(iii) Spatial visualization is the ability to visualize and manipulate mental images.

(iv) Memory is the ability to recall the information.

(v) Perceptual speed is the ability to quickly identify patterns and

difference among different subjects.

(vi) Deductive reasoning is the ability to find out the rules to solve problems.

(vii) Word fluency is the ability to make words rapidly.

2. Secondary mental abilities

These are clusters of primary mental abilities that are related to specific intellectual functions.

For example, comprehension, arithmetic, and spatial relations.

These are more complex and are thought to result from the interaction of multiple primary abilities.

How does the general mental ability scale differ from the IQ test?

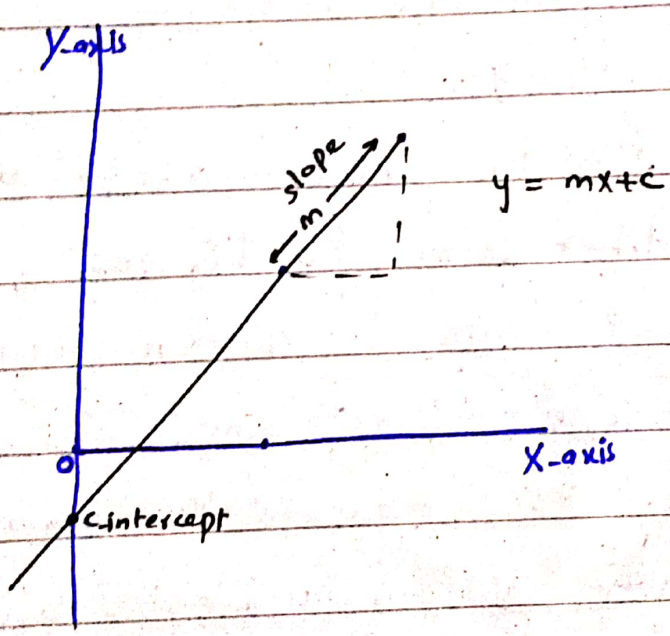
While both aim to measure brain power, they do so in different ways. General mental abilities scales, involve measuring a broad range of primary mental abilities. They aim to capture an individual's overall cognitive functioning. IQ tests, on the other hand, typically provide a single, global score that represents a person's general cognitive ability, like Wechsler Intelligence

Scale for Children (WISC).

In summary, general Mental Ability scales assess these abilities seperately, while traditional IQ tests provide a single composite score representing overall cognitive ability.

(b) Graph for $Y = mX + C$

Equation represents a straight line in a Cartesian coordinate system, where, Y is dependent variable, X is the independent variable, m is the slope of the line, and C is the y-intercept.



Relation of X and Y, y is dependent on X. Increase in X will increase the Y.

m is the slope of the line, which determines how steep the line is. C is the y-intercept, which is the point where the line crosses the Y-axis.
