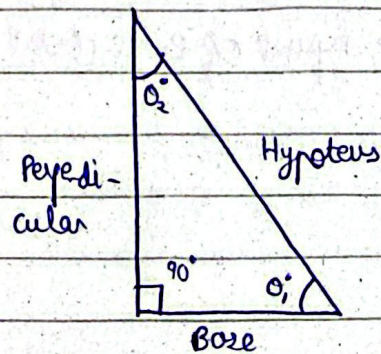


General Science and Ability - Year 2016

Question 10(a);

Define Right-angle triangle;

Triangle is a geometrical shape that has three corners and three sides. It has three angles, the sum of which is 180° . Right angle triangle is one of the many types of triangle in which one of the three angles is 90° . The formula used to calculate the sides of triangle is as follows;



$$\theta_1^\circ + \theta_2^\circ + 90^\circ = 180^\circ$$

$$(\text{Hyp})^2 = (\text{Perp})^2 + (\text{Base})^2$$

Similarly, to calculate area of a right-angle triangle we use the formula;

$$\text{Area} = \frac{1}{2} (\text{perp})(\text{base})$$

The angles θ_1° and θ_2° are related to hypotenuse, base and perpendicular by the following formulae;

$$\sin \theta_1^\circ = \frac{\text{Perp}}{\text{Hyp}}, \quad \cos \theta_1^\circ = \frac{\text{Base}}{\text{Hyp}}, \quad \tan \theta_1^\circ = \frac{\text{Perp}}{\text{Base}}$$

Define Equilateral triangles:

Equilateral triangle is one of the many types of triangle. In this all the sides of triangle are equal. All the angles are also equal. Let an angle be θ° so the formula becomes;

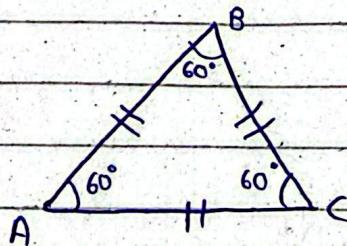
$$\theta^\circ + \theta^\circ + \theta^\circ = 180^\circ$$

$$3\theta^\circ = 180^\circ$$

$$\theta^\circ = \frac{180^\circ}{3}$$

$$= 60^\circ$$

so each angle is equal to 60° . The figure of equilateral triangle looks like the figure given below;



where the length of $AB = \text{length of } AC = \text{length of } BC$

(b) Total number of students = 9

Ages in sequence $\Rightarrow 15, 15, 16, 16, 16, 17, 17, 18, 19$

$$\text{Mean} = \frac{\text{Sum of all values}}{\text{Total no. of values}}$$

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

$$= \frac{149}{9} = 16.555$$

Median = The middle number of the range given

15, 15, 16, 16, 16, 17, 17, 18, 19

The median is 16 as it has 4 digits to its right and 4 digits to its left.

Mode = The number that has the highest frequency in the range of numbers given

The mode is 16 as it occurs 3 times in the given dataset.

Range = The difference between the highest and the lowest number of the data set given.

$$\text{Range} = 19 - 15 = 4$$

$$\text{Mean} = 16.555$$

$$\text{Median} = 16$$

$$\text{Mode} = 16$$

$$\text{Range} = 4$$

Question No. 11 - Year 2016;

Part a;

$$(i) \text{ Total stores that distribution company serves} = 3 + 15 + 26 + 20 + 16 = 80$$

(ii) The most common distance of stores from the company's godown = ?

Common distance is the range that has highest number of stores.

Highest number of stores = 26

Distance Range for 26 stores = 21-30 km

(iii) Stores that are 35 km or more from the godown = No. of stores in range (41-50 km)
= 16

(iv) % of stores that are 31 km or more = $\frac{\text{Stores (31-40 km)} + \text{Stores (41-50 km)}}{\text{Total stores}} \times 100\%$

$$= \frac{20+16}{80} \times 100\%$$

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

$$= 45\%$$

(b) Let's assume the weight of Melba is 60 kg.

Weight of Noor = Half of Melba's weight

$$= 60 \div 2$$

$$= 30 \text{ kg}$$

Weight of Akbar = Half of Noor's weight

$$= 30 \div 2$$

$$= 15 \text{ kg}$$

Weight of Ali = 5 times as Akbar's weight

$$= 5 (15)$$

$$= 75 \text{ kg}$$

$$\begin{aligned}
 \text{Weight of Ahmad} &= \text{Thrice as much as Ali} \\
 &= 3(75) \\
 &= 225 \text{ kg}
 \end{aligned}$$

- (i) Ahmad is heaviest in weight.
- (ii) Akbar is lightest in weight.
- (iii) Shekhar is lighter than Ali and Ahmad.
- (iv) Shekhar is heavier than Naim and Akbar.
- (v) Descending order of weights of students;

Ahmad, Ali, Shekhar, Naim, Akbar

Question No. 12;

Part(a);

People with blood group A = 300

People with blood group B = 325

People with blood group O = 250

People with blood group AB = 125

Prob (Person with group AB) = $\frac{125}{300+325+250+125}$

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

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

(b)

Five cities $\Rightarrow V, W, X, Y, Z$

Five friends $\Rightarrow$ Ahmad, Ali, Albar, Nasir, Selby

Five modes $\Rightarrow$ Bus, train, aeroplane, car, boat

Albar $\xrightarrow{\text{car}}$ Y

Ali $\xrightarrow{\text{air}}$ X

Nasir $\xrightarrow{\text{boat}}$ W

Selby $\xrightarrow{\text{train}}$?

Ahmad $\xrightarrow{\text{bus}}$?

(i) Ahmad travelled by bus. He may have travelled to either V or Z, due to unavailability of data given this cannot be determined.

(ii) Ali travelled by aeroplane to destination X.

Question No. 13 ;

Part(a) ;

<u>Primary Mental Abilities</u>	vs	<u>Secondary Mental Abilities</u>
1) <u>Word Fluency</u> : ability to make words rapidly		(1) <u>Fluid intelligence</u> (flexibility, adaptiveness and relational thinking)
2) <u>Verbal Comprehension</u> : describe and understand words.		(2) <u>Crystallized intelligence</u> (breadth of knowledge).
3) <u>Spatial Visualization</u> : visualization of different relationship		
4) <u>Number Facility</u> : solving mathematical problems.		
5) <u>Associative Memory</u> : Memorize and recall		
6) <u>Reasoning</u> : Find out rules.		

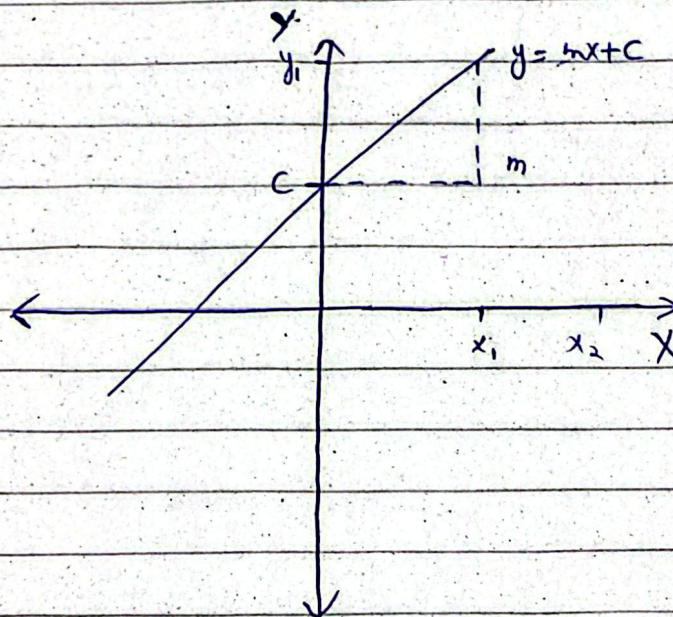
Mental Ability Scale

- ① Measures specific areas of intelligence of a person.
- ② Age is not a factor
- ③ Separate score for each category
- ④ Common use (pre-employment testing)

IQ Test

- ① General intelligence of a person - comparison to other people.
- ② Age is required
- ③ One single score as whole
- ④ Research and educational use

(b)



C is the y -intercept. It is the point at which the line cuts the positive y -axis. m is the gradient of this line which can be calculated by making a right angle triangle ~~at the~~ by joining two points of the slope and finding the rate of change at both y -axis and x -axis;

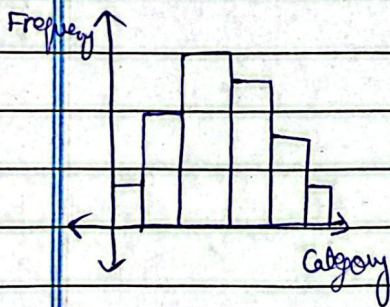
$$m = \frac{y_1 - c}{x_1 - 0}$$

DATE: ___/___/___

DAY: ___/___/___

Year 2017 - Question #6 :Part (a) :Histogram

- ① Data is grouped
- ② Continuous data
- ③ No 'key' is required
- ④ Easy to compare

Pictogram

- ① Pictorial representation of large data in which picture/symbols are used
- ② Large data
- ③ Key is required
- ④ Presentable and attractive

Mode	No. of students
Bus	**
Taxi	***
Car	*
Foot	* represents 5 children

Part (b) :Frequency Table

Hours spent daily	No. of teachers
1	5
2	8
3	6
4	4
5	2
6	1

DATE: ___/___/___

DAY: ___/___/___

Part (c) ;

$$\begin{aligned}\text{No. of teachers who reported} &= 5+8+6+4+2+1 \\ \text{to the survey} & \\ &= 26\end{aligned}$$

Part (d) ;

Least no. of hours spent = 6 hours

Most common no. of hours spent = 2 hours
as 8 teachers did it

