

## Section II

Q6.

6a. Given data;

5 years ago, father age 3 times age of son

Son's current age is 30 years

Find father's current age.

$$\rightarrow \text{Son's age 5 years ago} = 30 - 5 = 25 \text{ years}$$

$$\text{Father's age 5 years ago} = 25 \times 3 \\ = 75 \text{ years}$$

$$\text{Father's current age} = 75 + 5 \\ = 80 \text{ years.}$$

6b. Mean = 50

Given numbers = 10, 30, Y, 50

Find Y

$$\text{Mean} = \frac{10 + 30 + Y + 50}{4}$$

$$50 = \frac{10 + 30 + Y + 50}{4}$$

$$200 = 10 + 30 + Y + 50$$

$$200 = 90 + Y$$

$$200 - 90 = Y$$

$$110 = Y$$

Value of 'Y' = 110

6c. The sequence 2, 6, 18, 54, \_\_\_\_\_

we interpret that the sequence goes on the basis of multiplying the previous number by 3;

$$2 \times 3 = 6, \quad 6 \times 3 = 18, \quad 18 \times 3 = 54$$

then  $54 \times 3 = 162$

The missing number is 162.

6c. ii. The sequence is  
3125, 254, \_\_\_\_\_, 4, 1

The sequence involves a pattern  
of decreasing power

$$1^5 = 1$$

$$2^5 = 32$$

$$3^5 = 243$$

$$4^5 = 1024$$

$$5^5 = 3125$$

So, the missing term is 254.

Q6d. Given data

product of two numbers = 320

ratio = 1:5

let the numbers be  $x$  and  $y$

then  ~~$x/y = 1/5$~~  and  ~~$x/y = 1/5$~~  or  $x:y = 1:5 \Rightarrow \frac{x}{y} = \frac{1}{5}$

and  $x \times y = 320$  — eq ①

as  $\frac{x}{y} = \frac{1}{5}$

then  $x = \frac{1}{5}(y)$

putting in eq ①

$$\frac{1}{5}y \times y = 320$$

$$\frac{1}{5}y^2 = 320$$

$$y^2 = 320 \times 5$$

$$y^2 = 1600$$

Similarly

~~$x/y = 1/5$~~

$$\frac{x}{y} = \frac{1}{5}$$

$$y = 5x$$

then putting in eq ①

$$x \times y = 320$$

$$x \times 5x = 320$$

$$5x^2 = 320$$

$$x^2 = \frac{320}{5}$$

$$x^2 = 64$$

$$\begin{array}{r} 64 \\ 5 \overline{) 320} \\ \underline{30} \\ 20 \end{array}$$

The difference of the squares of both numbers is

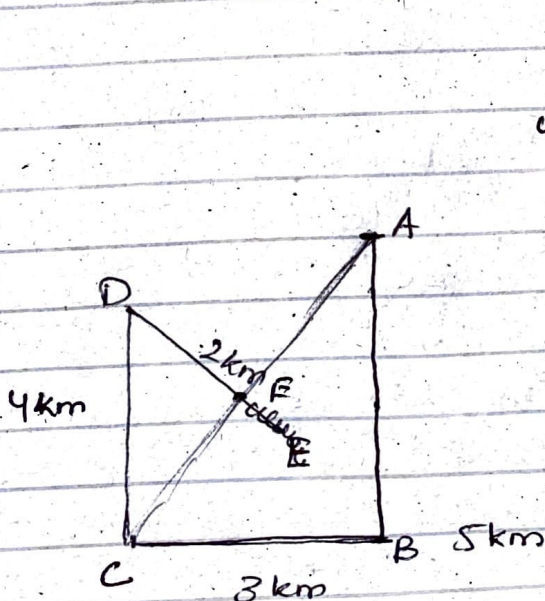
$$\Rightarrow 1600 - 64 = \underline{\underline{1536}}$$

Ans.

$$\begin{array}{r} 1536 \\ - 64 \\ \hline 1536 \end{array}$$

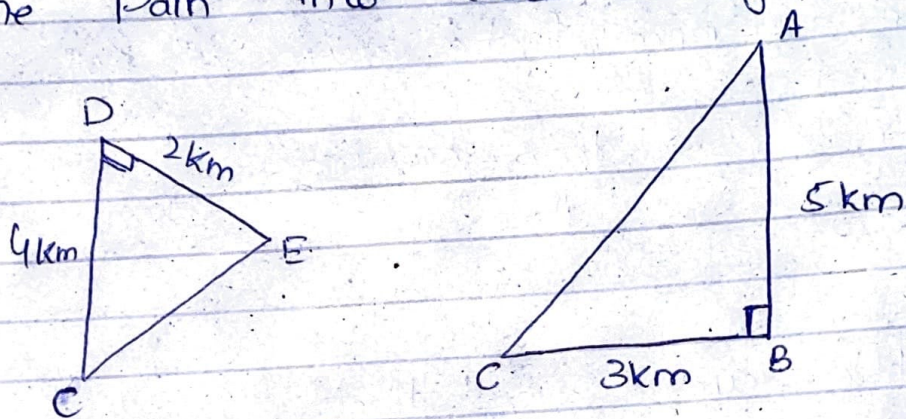
80. We are given that

Cow travels 5km South  
then 3km west  
and then 4km North  
finally 2km South east



If we look at the path of the Cow then;

The distance ~~travel~~ from initial point is distance of point AE. That can be calculated by finding the distance AC and then subtracting CE from it, dividing the path into two triangles



To find AC

$$AC^2 = AB^2 + BC^2$$

$$AC^2 = 5^2 + 3^2$$

$$AC^2 = 25 + 9$$

$$AC^2 = 34$$

To find CE

$$CE^2 = 2^2 + 4^2$$

$$= 4 + 16$$

$$CE^2 = 20$$

$$AE = \sqrt{AC^2 - CE^2}$$

$$AE^2 = 34 - 20$$

$$AE^2 = 14$$

Q8b. Total slices = 8  
 Slices with raisin = 3  
 Probability of picking slice with raisin = P  
 $P = \frac{3}{8}$   
 $P \approx 37 \approx 37\%$

$$\begin{array}{r} \overset{-37}{8} \overline{) 30} \\ \underline{24} \\ 60 \\ \underline{56} \\ 40 \end{array}$$

Q8c. There are a total of 14 triangles.

Q8d. The IQ of an individual can be affected by a person's genetic problem, heredity, their nutrition, their early childhood environment and their mental state.

### Section - I.

Q5a. 1. RAM (Random Access Memory).

Ram is a type of computer memory that loses its stored data when power is turned off.

a. function of RAM

RAM stores the data temporarily that CPU needs to access quickly.

Data in RAM can be both read and written from to allow for quick modification.

b. Types of RAM

There are different types of RAM, including DDR, DDR3 and DDR4.

2. Rom (Read only memory).

ROM is a type of computer memory that is non-volatile, it retains its stored data when computer is powered off.

#### a. Functions of Rom.

ROM stores the firmware and permanent instructions essential for booting up the computer and perform fundamental tasks.

#### b. Types of Rom

The different types of Rom are P-Rom (Programmable Rom); EPROM (Erasable Programmable Rom), and EEPROM (Electrically Erasable Programmable Rom).

#### 3. Nibble

A nibble is a unit of data equal to four bits or half a byte. Nibbles are used in computing and digital systems for data representation and manipulation, especially in context where smaller unit of data are required.

#### 4. USB (Universal Serial Bus)

USB is a standard interface used to connect various devices to a computer for communication, data transfer and power supply. It has various types with various data transfer speed the slowest being USB 1.1 and fastest being USB 3.0.

b. How AI has revolutionized the world?

Justify.

Artificial Intelligence is the computer program that generates, analyze and optimize data processes. The AI with human like abilities and higher IQ can easily analyze data that would take hours for a human only to read and AI not only reads but analyze it within seconds. AI with higher IQ than a normal average human can solve critical mathematical equations that normal computers could not solve. Due to this AI has revolutionized the world in different fields from medical sciences to astronomy.

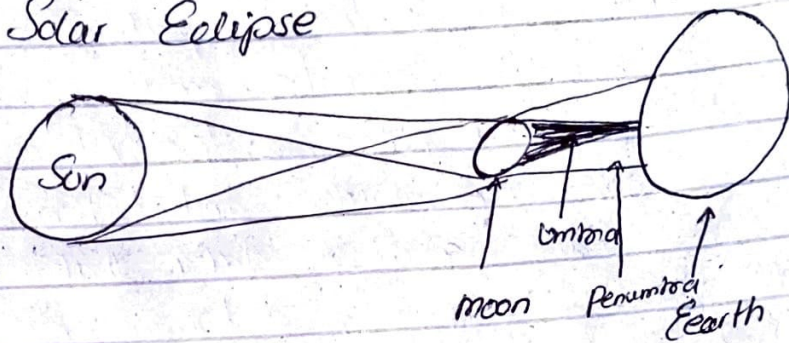
Q5. Optical fibre is a data transmitting cable that uses <sup>total</sup> internal reflection of light to transfer data from one point to another within seconds. Optical fibres have plenty of Advantages as ;

a. It reduces the time taken for data to travel.

b. It can send light signals and while being bended this has helped in performing medical surgeries with the help of cameras.

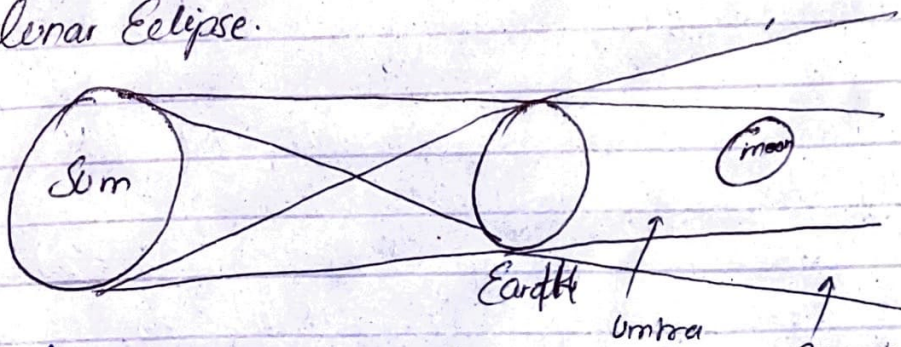
Q4. Distinguish solar and lunar Eclipse.

### Solar Eclipse



Solar eclipse is the situation where moon aligns perfectly between Sun and the earth blocking the sun light to travel. This casts a shadow on earth the Umbra region is where people feel complete darkness and the moon seems like a ring, sunlight passing by its parameters. While the penumbra region is not that dark where people does experience the eclipse but its not that dark.

### Lunar Eclipse.



Lunar Eclipse is the situation where earth aligns perfectly between Sun and moon blocking the Sun light to travel into moon. This phenomenon



brings a red or orange color  
hue on moon. due to the light  
reflected from the earth's dust in  
the atmosphere. If the moon is  
the penumbra region then there is  
only dimming of light.

Q4d. Dopping in Semi-Conductors is  
the process of adding impurities  
in the substance to alter its  
electro ability to conduct electricity.