

Mock Exam (2023)

Dated: 14-03-2023

Subject: General Knowledge-I
General Science & Ability

Timing: 10am - 1pm

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Batch: OB-47 (online)

Question No. 5 Part-I, Section-1

a) What do you understand by term Remote sensing
Write its basic principle. Give its important implications

• Remote Sensing:

• Definition:

The science or technology of detecting, measuring and analyzing the characteristics or attributes of remote objects without having a physical contact with them.

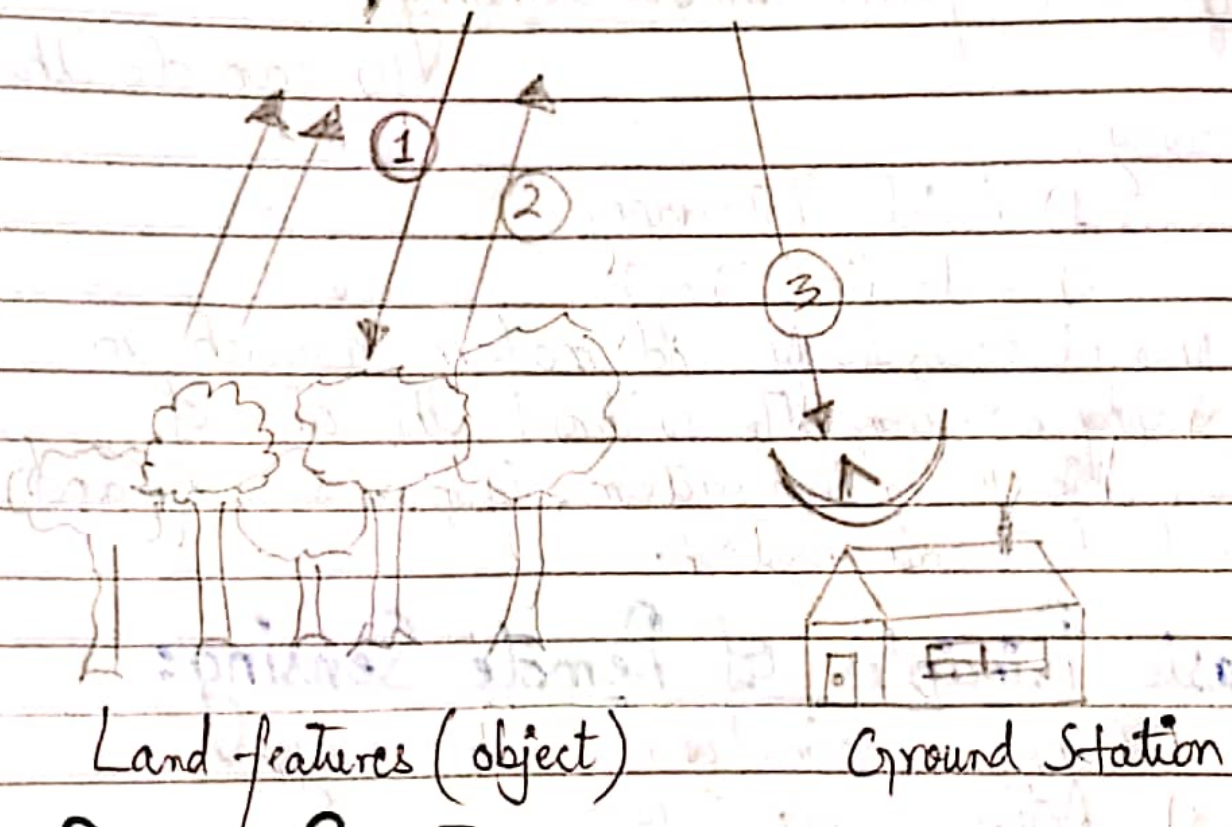
• In other words, Remote Sensing can be defined as:

We can gather information about earth while staying away from the earth.

• Remote Sensing enables us:

Active Remote Sensing

Satellite
(Source & Sensor System)



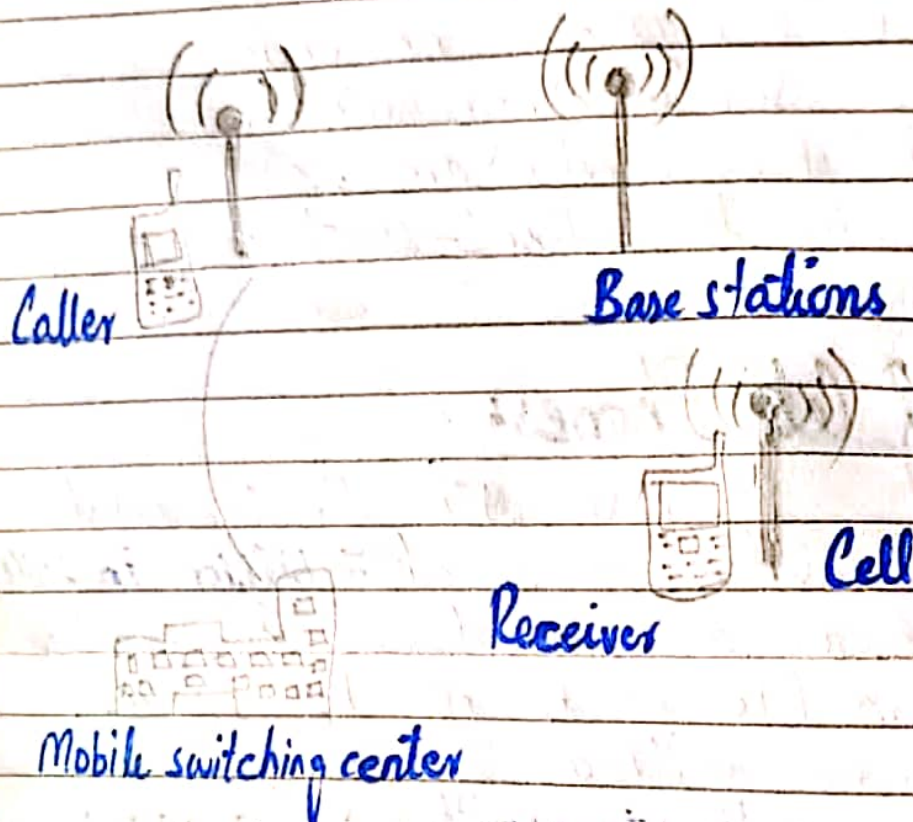
2) Passive Remote Sensing

Passive Remote Sensing depends upon electromagnetic radiation of the sun! The electromagnetic waves tend to reflect from earth's surface or transfer to atmosphere in the form of heat waves from the earth.

• Waves recorded on:

These waves are recorded on a remote sensor fixed on the satellite. The information obtained from these waves are transformed into

- cell phones come with additional functions such as web-surfing, taking pictures, playing games, sending text messages and playing music. More sophisticated smart phones can perform similar functions of a portable computer.



"How mobile Network works"

Structure of Cell Phones:

- The common components found on all phones are:
- 1) A number of metal-oxide-semiconductor (MOS)
 - 2) Integrated circuit chips (IC)
 - 3) A battery (typically a lithium-ion battery) providing the power source for the phone functions.
 - 4) An input mechanism, to allow the user to interact with the phone.

c) Briefly explain the working and structure of cellphone.

• Cell Phone:

A mobile or cell phone is a portable telephone that can make and receive calls over a radio frequency link while the user is moving within a telephone service area, as opposed to a fixed-location phone.

• Working of Cell Phones:

With world wide mobile subscriptions estimated to be around **7 billion in 2014**, cell phones become a universal and indispensable tool for modern life. In the most basic form, a cell phone is essentially a two-way radio, consisting of a **radio transmitter** and a **radio receiver**. When we chat with our friend on our cell phones, our phone converts our voice into an electrical signal, which is then transmitted via radio waves to the nearest cell tower.

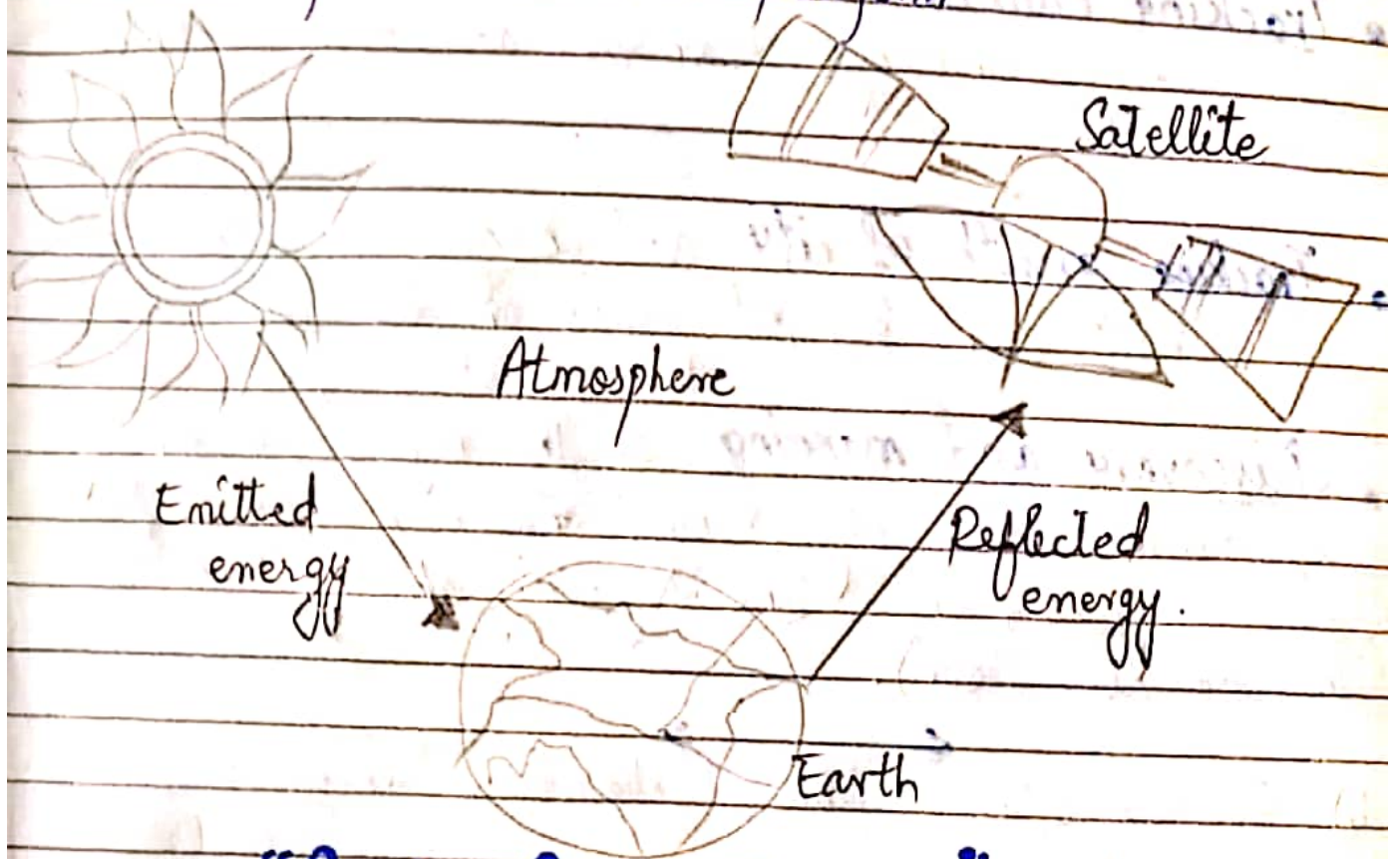
The network of cell towers then relays the radio waves to our friend's cell phone, which converts it to an electrical signal and then back to sound again.

In the basic form, a cell phone works just like a **walkie-talkie**. In addition to basic functions of voice calls, most modern

Digital satellite imaging.

• Platform:

The satellite or aeroplane on which the remote sensor is fixed is called platform.



• "Passive Remote Sensing"

• As an Example; in context of Pakistan:

Pakistan, in recent years, has successfully experimented the launching **Badr-1** and **2** satellites in space. These days **Pak-sat-1** in space is promoting telecommunication developments in Pakistan.

• Important Implications of Remote Sensing:

Some specific uses of remotely sensed images of the Earth include:

• We rely on

We rely on them to transmit light signals over long distances.

• Transmitting source

At the transmitting source, the light signals are encoded with data, the same data we see on screen of a computer.

• Receiving end

Fiber transmits "data" by light to a receiving end, where the light signal is decoded as data.

• Fiber optics is a transmission medium:

Fiber optics is actually a transmission medium - a "pipe" to carry signals over long distances at very high speeds.

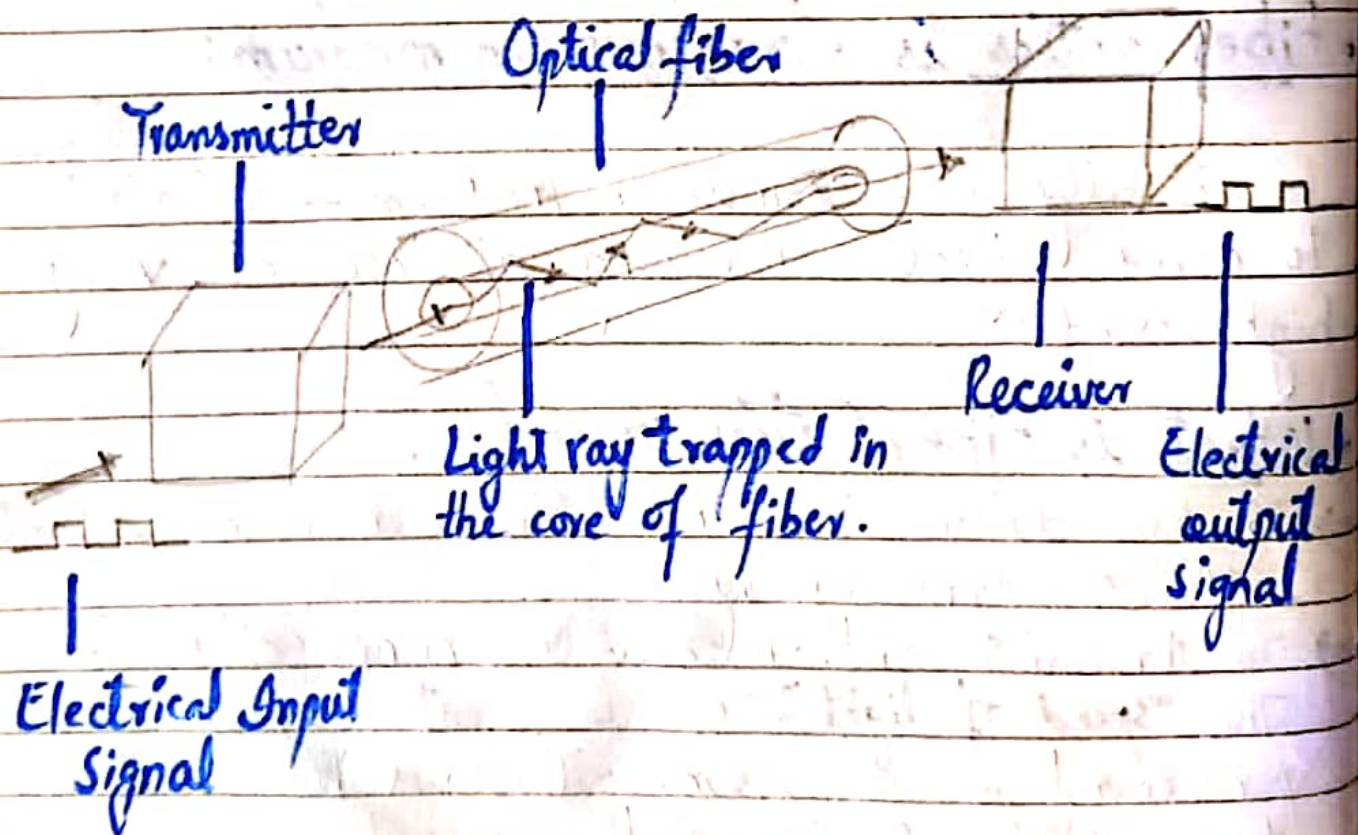
• What is Fiber Optics used for?

- ⇒ To help doctors view the inside of a human patient without major surgery.
- ⇒ To transmit and receive telephone calls at the "speed of light" that is about 186,000 miles per second in a vacuum, but slows to about two-thirds of this speed in a cable.
- ⇒ For signal transmission, communication and vision (video).

• How does a Fiber Optic Communication works?

Light travels down a fiber optic cable by bouncing off the walls of the cable repeatedly. Each light particle (photon) bounces down the pipe with continued internal mirror-like reflection.

The light beam travels down the core of the cable. The core is the middle of cable and glass structure. The **cladding** is another layer of glass wrapped around the core. Cladding is there to keep the light signals inside the core.



d) Explain Artificial Intelligence

• Artificial Intelligence:

AI, The ability of a digital computer or a computer controlled robot to perform tasks commonly associated with intelligent beings.

• Term applied to:

The term is frequently applied to the project of developing systems endowed with the intellectual processes characteristic of humans, such as the ability to reason, discover meaning, generalize, or learn from past experience.

• What is Robotics?

Robotics is a branch of engineering that involves the conception, design, manufacture & operation of robots.

• Its Objective:

The objective of robotics field is to create intelligent machines that can assist humans in a variety of ways. Robotics can take on a number of forms.

- 1) To have a birds eye view of a place from a certain distance.
- 2) It helps in studying and portraying the earth on local, regional and global level.

• Ways to perform Remote Sensing:

We can do this

in 2 ways

- 1) Aerial Photography
- 2) Satellite Imaging

In present age, study and modern research in geography is incomplete without the aid of Geographic information system, Remote sensing and Global Positioning system.

• Basic Principles of Remote Sensing:

Remote Sensing work in two ways:

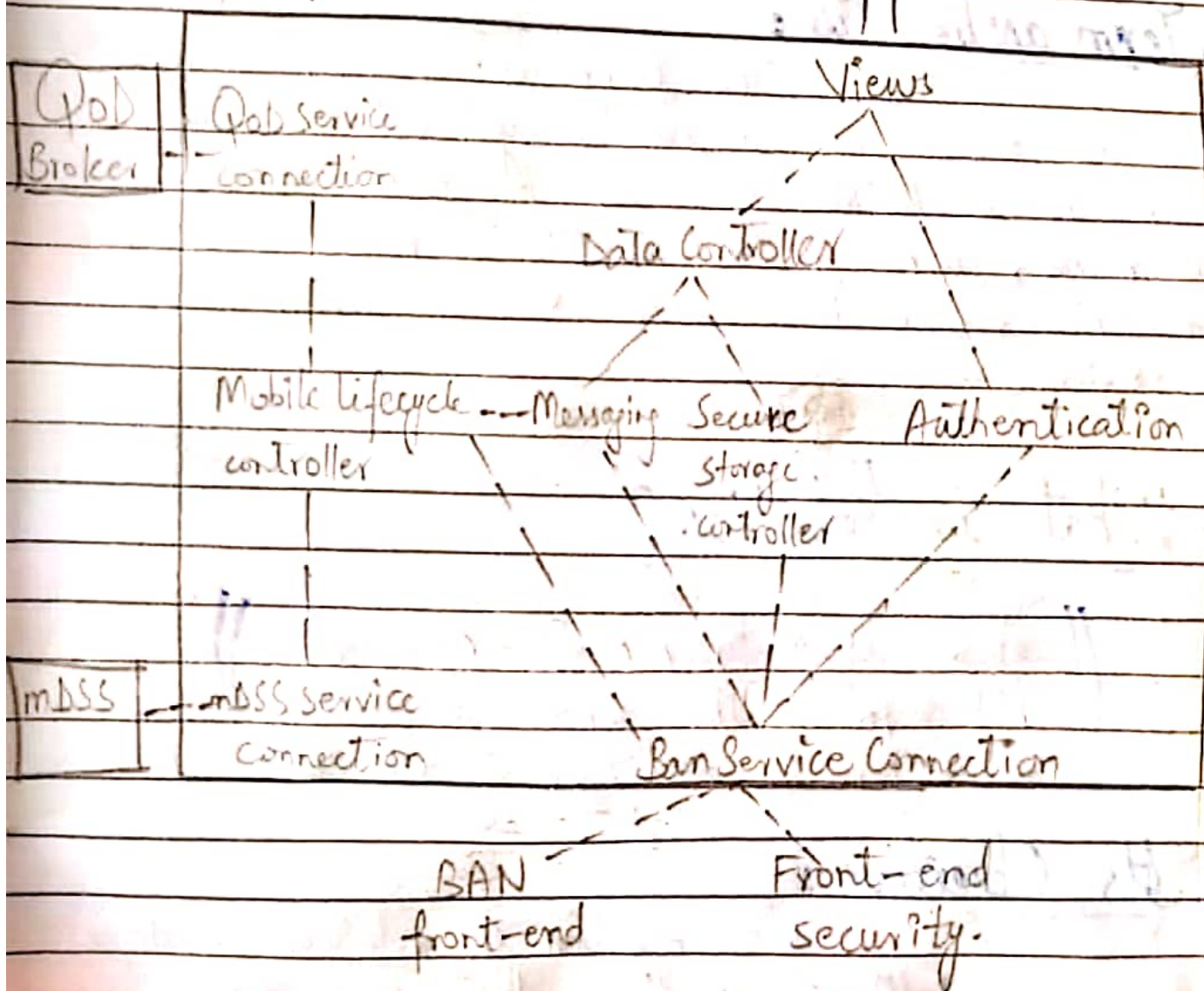
- 1) Active Remote Sensing
- 2) Passive Remote Sensing

1) Active Remote Sensing:

In Active Remote Sensing, Radar waves from a satellite are sent to earth. These waves are (sent to earth and) recorded on earth on an instrument known as **Remote Sensor**.

⇒ 7 main parts of mobile phone:

- An amazing circuit board containing the brains of the phone.
- An Antenna.
- A liquid crystal display (LCD)
- A keyboard
- A microphone
- A speaker
- A battery.



Now putting values in formula, we get:

$$\begin{aligned}\text{Share of Tahir} &= \frac{1}{6} \times 406,000 \\ &= 67,666.6 \text{ Rs.}\end{aligned}$$

$$\begin{aligned}\text{Share of Ummer} &= \frac{2}{3} \times 406,000 \\ &= 135,333.3 \text{ Rs.}\end{aligned}$$

$$\begin{aligned}\text{Share of Usman} &= \frac{3}{6} \times 406,000 \\ &= 203,000 \text{ Rs.}\end{aligned}$$

c) Brother is written as **QDGSNQA**

Sister will be coded as **HQHSQA**.

d) Jogging track = 2000 meters

$$25\% \text{ covered area} = \frac{25}{100} \times 2000$$

$$= 25 \times 20$$

$$= 500 \text{ meters}$$

Track left to be covered = 1500 meters

(Part-II, Section-II)

Question no. 6

a) Identify the series:

4, 18, 100, _____, 294

Given Data:

- b) Tahir's investment = Rs 15,000
Umer's investment = Rs 30,000
Usman's investment = Rs 45,000

Profit = Rs 406,000.

To find:

Share of each = ?

Formula:

Share of each = $\frac{\text{individual ratio}}{\text{Sum of ratio}} \times \text{Total profit}$

Solution:

Tahir	Umer	Usman
15,000	30,000	45,000
15	30	45
3	6	9
1	2	3

Sum of Ratios = 1+2+3
= 6

$$\begin{array}{ccccccc} & \times & 12 & 2 & 11 & 20 & 2 & 9 \\ \textcircled{1} & D & 9 & 5 & N & 9 & A \\ 16 & 12 & 2 & 11 & 25 & 2 & 9 \end{array}$$

$$16 + 12 = 28 \quad \uparrow$$

$$11 + 11 = 22 + 3$$

$$16 - 12$$

$\textcircled{4}$

$$4 + 2 = 6 \times 2 = 12 - 1 = 11$$

$$11 \times 2 = 22 + 3 = 25$$

SQA

Question no. 7

a) Father's age = $x + 4$ years
Daughter's age = x years

According to given conditions

$$x + 4x + 3(x) = 5 + 5$$

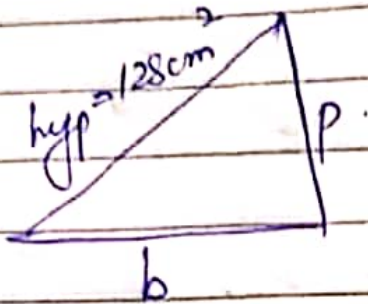
$$8x + 3x = 10$$

$$8x = 10$$

$$x = \frac{10}{8} = \frac{5}{4}$$

$$x = \frac{5}{4} = 1.25 \text{ years}$$

b) Hypotenuse = 128cm^2



$$\text{Area of a triangle} = (\text{length of side})^2$$

$$(128)^2 = \text{length of side}^2$$

$$\sqrt{(128)^2} = \sqrt{(\text{length of side})^2}$$

$$\text{length of side} = 128 \text{ m.}$$

c) Median is considered to be mid value of an ascending or descending ordered arranged data.

Median = ?

• Mode is the most repetitive value in a specific data.

• Range is the highest value in a data