

Date: _____

Day: _____

$$\text{Total} = \frac{32.5}{40}$$

Question No 2

A

Solution:

Let the numbers in ratio of 3:5 are $3x:5x$

if 9 is subtracted then the ratio becomes

$$12:23$$

$$\frac{3x-9}{5x-9} = \frac{12}{23}$$

$$23(3x-9) = 12(5x-9)$$

$$69x - 207 = 60x - 108$$

$$69x - 60x = 207 - 108$$

$$9x = 99$$

$$x = 11$$

Since the numbers are $3x$ and $5x$

So 1st number is $= 3x$

$$= 3 \times 11$$

$$= 33$$

and 2nd number is $= 5x$

$$= 5 \times 11$$

$$= 55$$

So the smallest number is 33 .

Solution: The profit = 5:7:8

Let the ratio of their investment
is $x_1 : x_2 : x_3$

Ratio of investment is equal to ratio
of profit

also they partnered for 14, 8 and 7 months

so,

$$14x_1 : 8x_2 : 7x_3 = 5 : 7 : 8$$

first take ratio of 1st and 2nd
term

$$\frac{14x_1}{7} = 5$$

$$\frac{8x_2}{7} = 7$$

$$49x_1 = 20x_2$$

$$\text{so } x_2 = \frac{49x_1}{20}$$

Now take ratio of 1st and last

term

$$\frac{x_1}{7x_3} = \frac{5}{8}$$

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$$B \quad 16x_1 = 5x_3$$

$$x_3 = \frac{16x_1}{5}$$

22

$$\text{So } x_1 : x_2 : x_3 = \frac{x_1}{1} : \frac{49x_1}{20} : \frac{16x_1}{5}$$

$$= 1 : \frac{49}{20} : \frac{16}{5}$$

Multiply with 20

$$= 1 \times 20 : \frac{49 \times 20}{20} : \frac{20 \times 16}{5}$$

$$x_1 : x_2 : x_3 = 20 : 49 : 64$$

The ratio of their investment was 20:49:64

5

Solution:

As given

$$A+B+C = 45 \text{ kg}$$

$$A+B+C = 135 \text{ kg} \rightarrow (A)$$

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Day: _____

it is also given =

$$\frac{A+B}{2} = 40 \text{ kg} \quad \checkmark$$

$$A+B = 80 \text{ kg} \quad \text{--- (2)} \quad \checkmark$$

and

$$A = 80 - B \quad \text{--- (3)} \quad \checkmark$$

$$\frac{B+C}{2} = 43 \text{ kg}$$

$$B+C = 86 \text{ kg} \quad \text{--- (4)} \quad \checkmark$$

$$C = 86 - B \quad \text{--- (5)} \quad \checkmark$$

Subtract ~~(2)~~ from (1)

$$\cancel{A+B} = \cancel{80} \text{ kg}$$

$$+\cancel{B+C} = \cancel{+46} \text{ kg}$$

Put 3 & 5 in (1)

So

$$80 - \cancel{B} + \cancel{B} + 86 - B = 135 \text{ kg}$$

$$186 - B = 135 \Rightarrow B = 186 - 135$$

$$-B = 135 - 186 \quad 135 - 186$$

$$+B = +31$$

$$B = 31 \text{ kg}$$

The weight of B is 31 kg

D

Solution:Let the number is x

According to the given conditions.

$$x+17 = 60 \times \frac{1}{x}$$

$$x+17 = \frac{60}{x}$$

$$x^2 + 17x = 60$$

$$x^2 + 17x - 60 = 0$$

$$x^2 + 20x - 3x - 60 = 0$$

$$x(x+20) - 3(x+20) = 0$$

$$(x+20)(x-3) = 0$$

$$x+20 = 0 \quad \text{or} \quad x-3 = 0$$

$$x = -20$$

$$\text{or} \quad x = 3$$

So, according to the question the positive number is $x = 3$

Question Nos

Optical fiber:

It refers to the medium and technology associated with the transmission of informations as light pulses along a hollow glass or plastic wire or fiber.

Principle:

working principle

The principle of working of optical fiber is the phenomena of total internal reflection. It means that if a light hit the glass at angle ^{Above} below the critical angle it bounces back to its medium. This phenomena is called total internal reflection. It keeps light inside the ~~pipe~~ fiber.

$$Q_c = 42^\circ$$

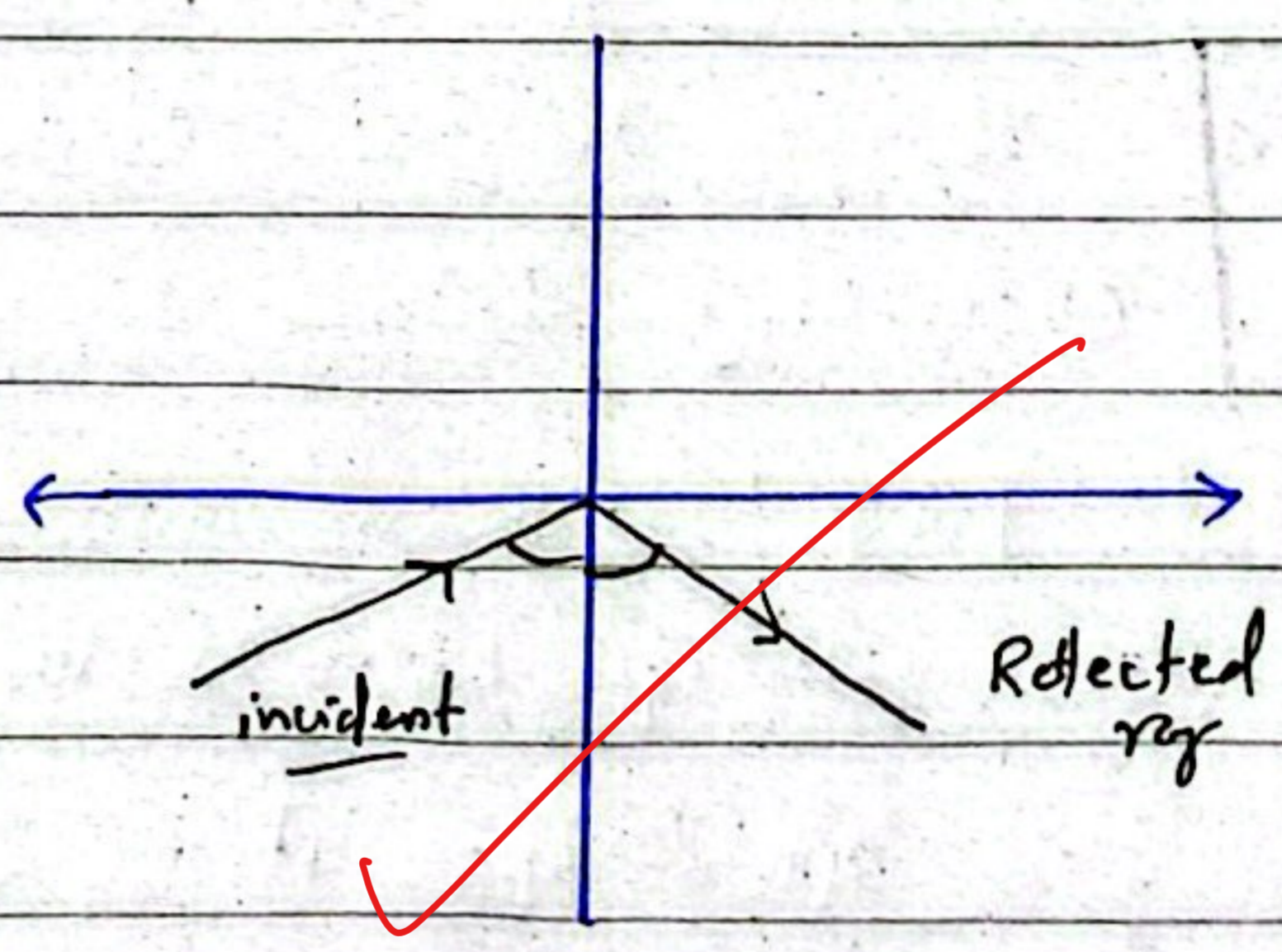
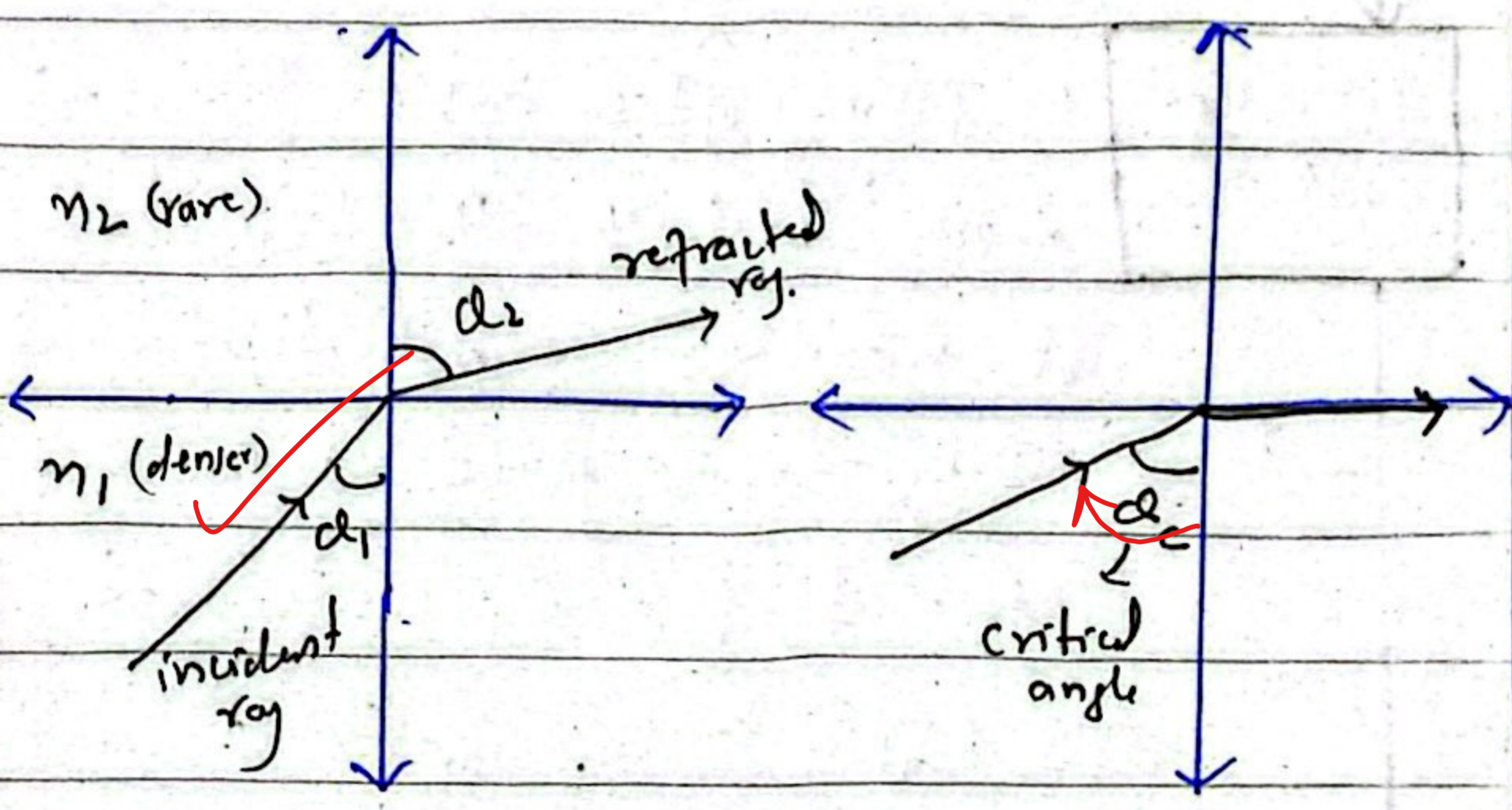
$$Q_r > Q_c$$

Working:

The information that is about to transmit through the optical fiber first converted into

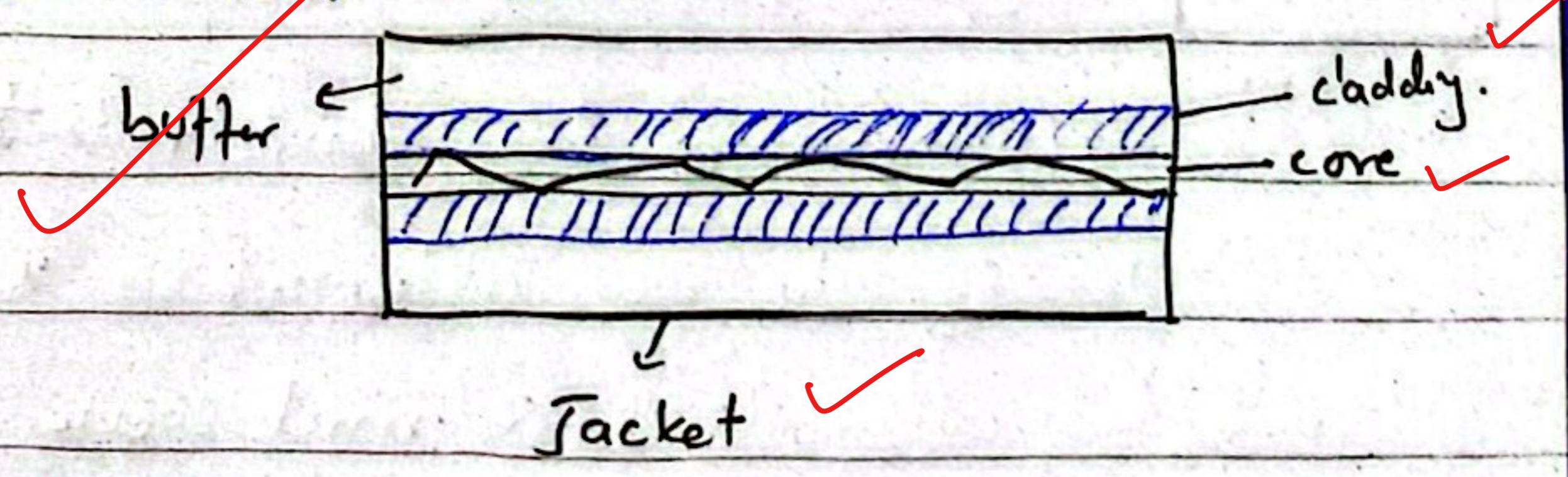
electrical voltage ~~signal~~ signal that

varying voltage is used to produce light with the help of Light emitting Diode and Injection Laser Diode. So, the light produce is then transferred through the core.



Total internal reflection.

Structure of optical fiber.



Importance of optical fibre:

High speed
Data transmission

Optical fibers enables faster and more efficient communication over long distance compared to traditional copper wires.

High Band-
width

Fibre optics cable have much more bandwidth than copper wire. It means the amount of information that can be transferred per unit time of fibre is greater than copper.

Low Power
loss

It can transfer single to over large distance because of low power loss. The maximum distance recommended for copper is 100 m while for optical fiber it is 2000m.

More secure

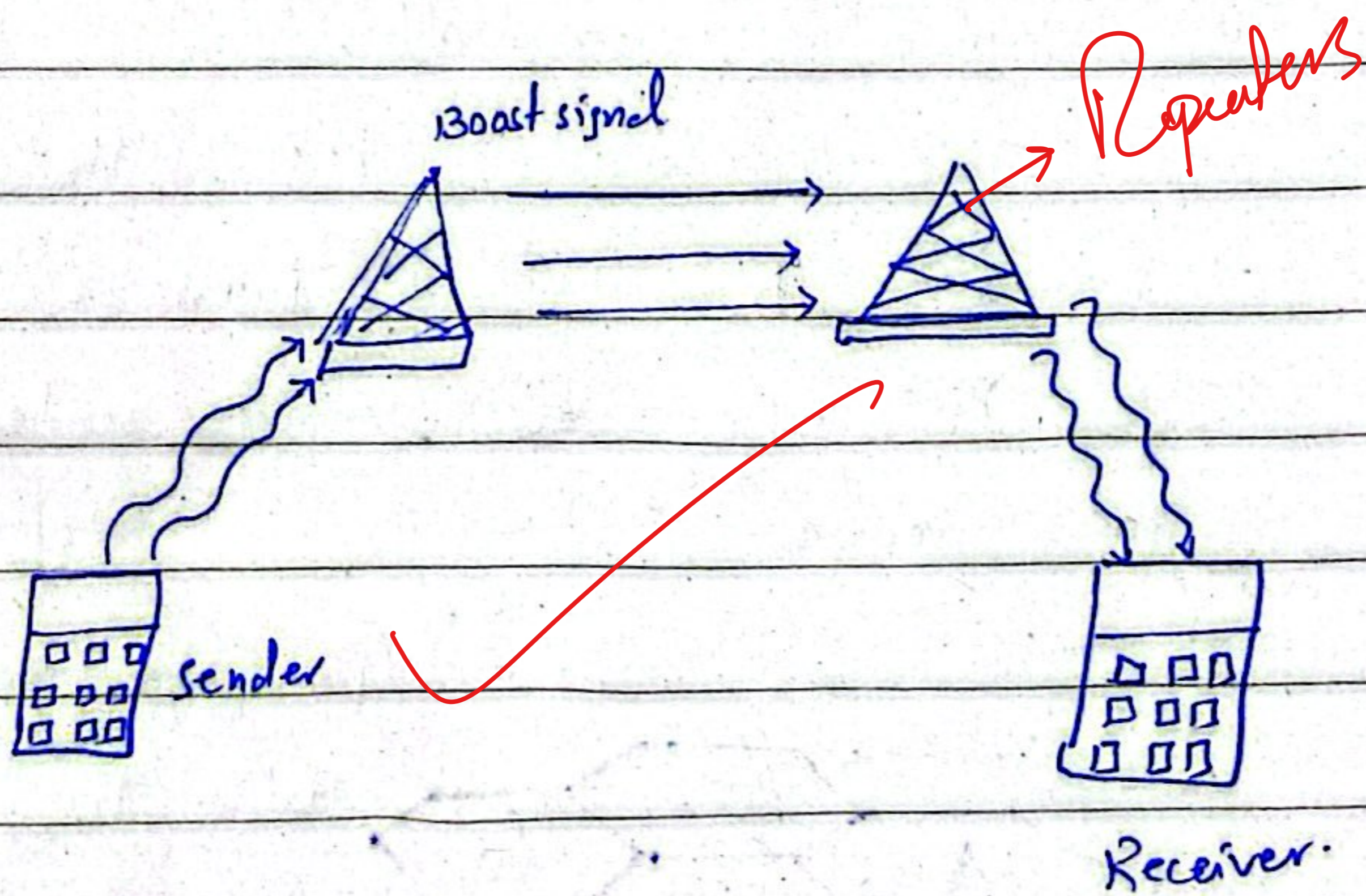
Optical fibre are difficult to tap or intercept. They do not radiate energy to the outer side so they can't be intercepted. It is most secure medium for data transmission.

3

B

Cell phone:

A cell phone is a telecommunication device that uses radio waves over a networked area and is served through a cell site or base station at a fixed location, enabling calls to transmit wirelessly over a wide range.



How it work:

Each city is divided into small divisions or cells.

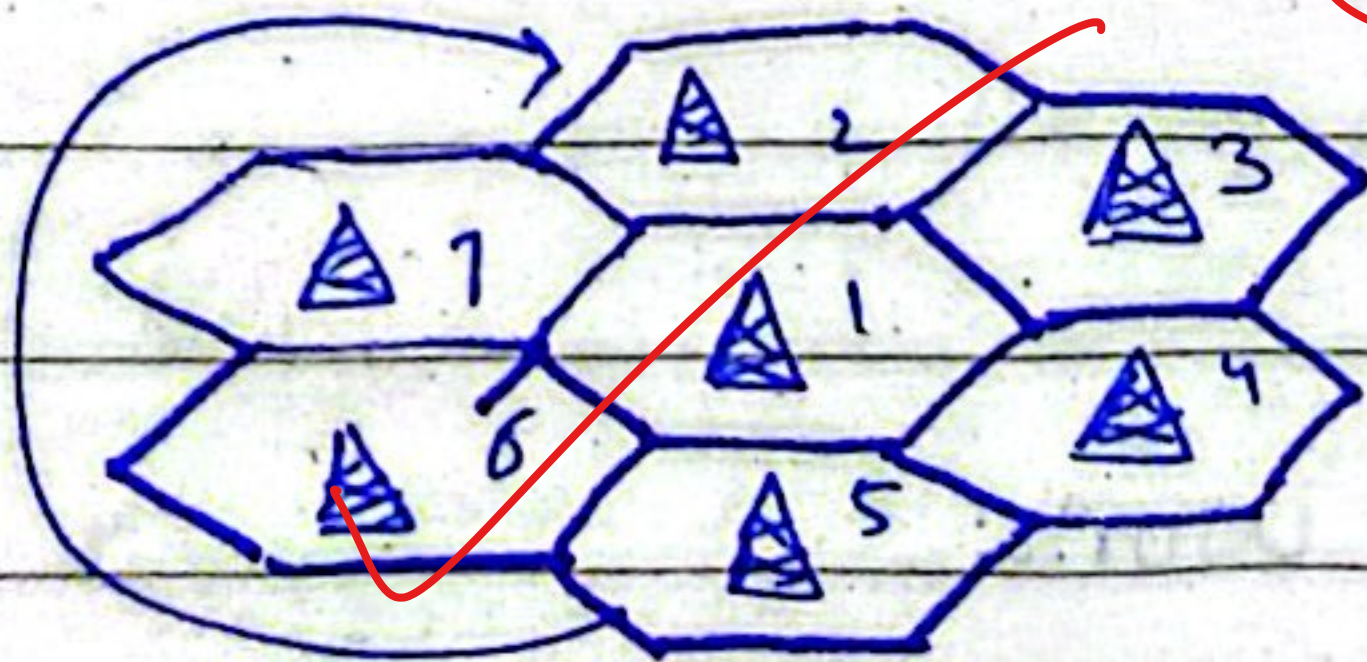
① The geographic area served by a cellular system is broken up into smaller geographic

Areas or cells

③ Because of low transmitting power of battery-operated in portable instruments. The specific frequency are boosted by a signal booster.

④ A central controller or mobile telephone switching office (MTSO) reroute the call from sender cell to receiver cell. This process is known as hand off.

⑤ The receiver receives the signal from the tower so in this way, it connects sender to receiver.



→ 5 connect with 2

Comments: Cell Phone block diagram is missing =

C

Satellite:

~~Communication satellite receive~~
~~inform~~ It is defined as:

Any object that revolves around the planet for a subjective purpose either communication or searching something important like searching for lives. *Def: When a small object revolves around a big object.*

How do communication satellite work. (*Tri-lateral principle*)

~~Communication satellite receive~~
 information from transmitter on Earth. (in an uplink) and beam it down to receiver elsewhere on the planet (in an downlink).

~~Satellite broadcasts typically involve one or more uplinks and multiple downlinks (to ground stations or individual satellite TV subscriber).~~

Global Positioning System.

A navigation system that allows land, sea and airborne users to determine their exact location, velocity and time. 24 hours a day, in all weather conditions from anywhere in the world.

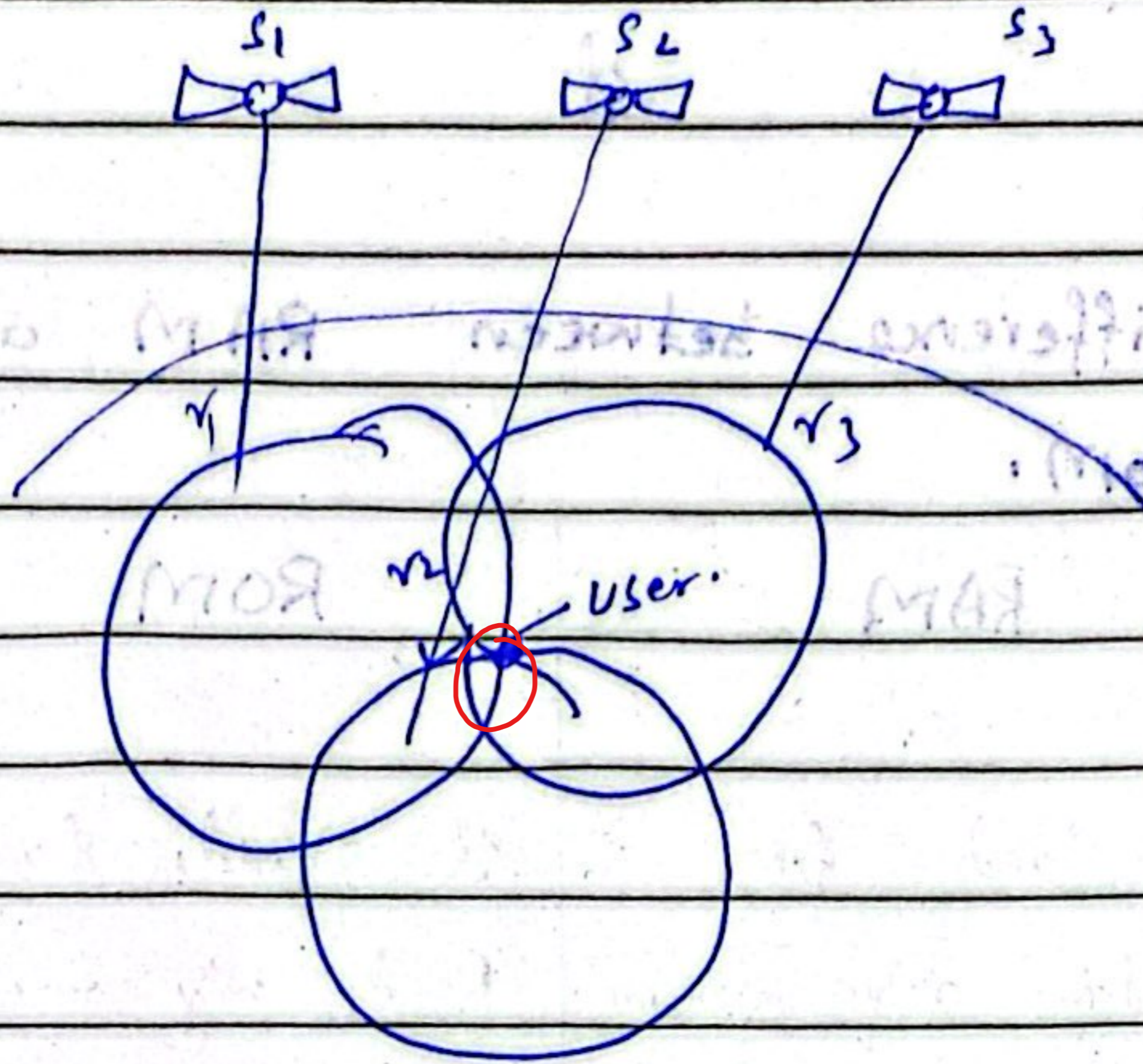
It consist of three segment.

(i) Space segment:

It consist of 24 satellite orbiting around the earth.

on Ground, any GPS receiver contain a computer that triangulate its own position by getting bearings from three or four satellites.

The result shows its position.



② Control segment.

It consist of global network of ground facilities that track, monitor their transmission, perform analysis and send command.

③ User segments

In general GPS receivers are composed of an antenna, tuned to the frequencies transmitted by the satellites, receiver processors and a high stable clock.

This shows how GPS work.

2.5

Difference between RAM and ROM.

RAM

ROM

- | | | |
|---|---|--|
| ① | It stands for random access memory. | It stands for Read only memory. |
| ② | The memory used for temporary storing of data and it access the data stored in computer randomly. | ② The memory that is permanent and can't be erase easily. |
| ③ | It is volatile memory that it lost when the power is turned off. | ③ The memory is not volatile. The data does not lose when the power is turned off. |

(4) It is used for executing application and storing dynamic data.

(17) It stores essential instructions required to boot the system.

(8) In RAM both Read and write operations are possible.

(5) In ROM only reading of data option is possible.

(6) This memory has higher speed.

(6) It is slower as compared to RAM.

(7) It is expensive means per unit of storage is costly.

(7) Less expensive than RAM, means per unit storage is inexpensive.

⇒ Data stored from factory.

(8) Its examples are DRAM, SRAM, DDR.

EROM, EPROM, and EEPROM are the

examples of ROM.

(9) Non-volatile RAMs have developed eg. NOR-Flash

⇒ Data can be changed through a special process.

(4)