

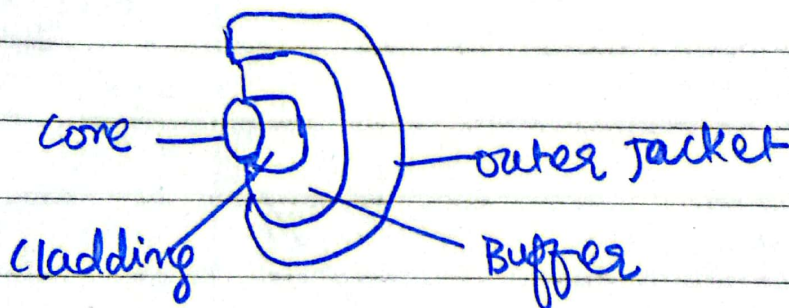
TEST-03

QNO1:

(A)

Optical Fiber:

Optical fiber is a flexible and transparent fiber that is made up of glass or plastic designed to transmit light signals.

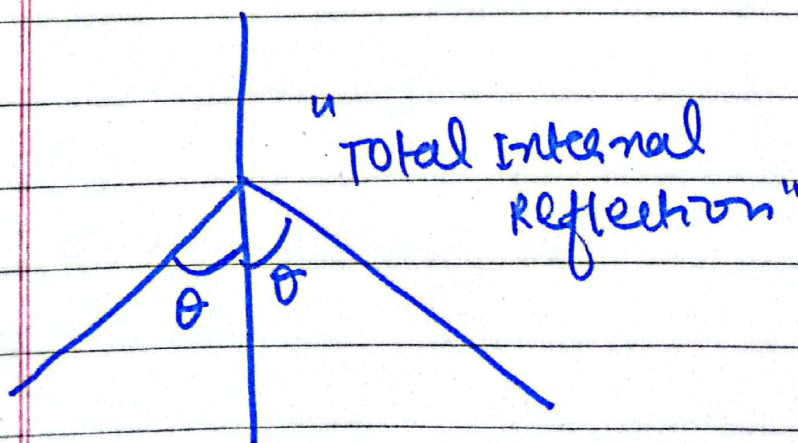
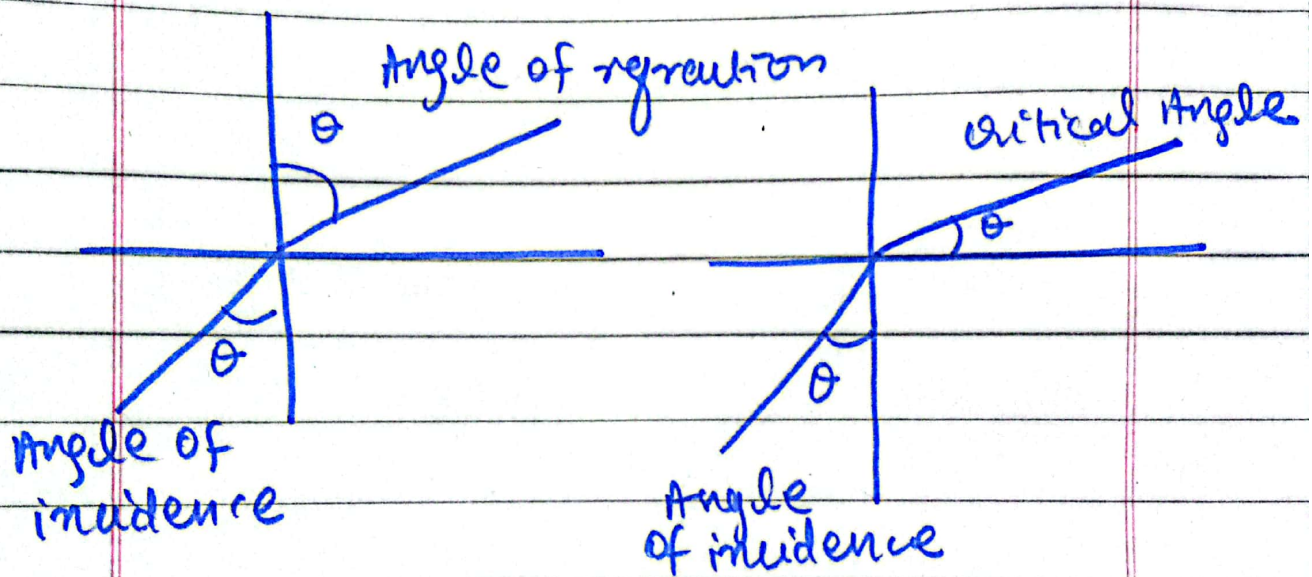


"Fiber Optics"

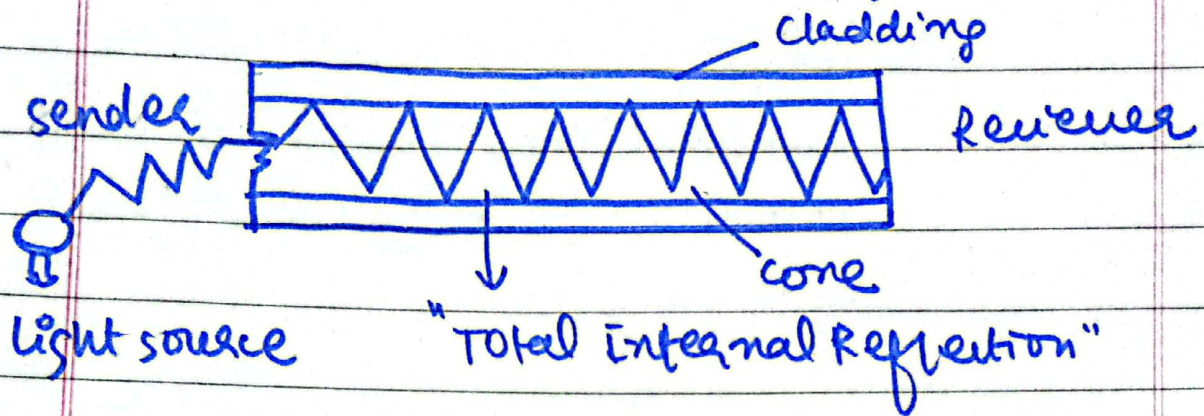
Working Principle of Optical Fiber:

The optical fiber works on the total internal reflection principle.

- (i) The light signal enters from the core in the optical fiber.
- (ii) The core has a higher refractive index as compared to the cladding.
- (iii) The light remains in the core following the total internal reflection principle and the cladding prevent light from escaping from the core.



(iv) Fiber optics works on the total internal reflection principle because in the core the angle of incidence is greater than the critical angle.



Importance of Fiber Optics:

(i) Telecommunication:

Fiber optics are useful in the field of tele-communications as it is used to connect telephone lines and used in broad band networks like 3G, 4G, and 5G.

(ii) Medical Field:

It is used in the medical field for the

purpose of diagnosis and performing surgeries.

(iii) Military and Aerospace:

Optical fibers used in military and aerospace explorations. It is used in spacecrafts and military equipments.

(iv) Industrial Explorations:

The fiber optics are important for the field of industrial explorations and exploring other important materials etc.

(C)

Satellite:

Any object that revolves around Sun and Moon is called satellite. There are two types of satellites including natural and artificial satellites.

Composition:

It is composed of four components.

- 1) Antennas
- 2) Power Supply
- 3) Transponder
- 4) Propulsion System

Antennas:

Antennas in satellites transmits and receives signals.

Power Supply:

It provides power

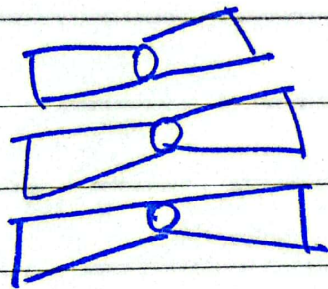
system to satellites. It is composed of battery and solar panels.

Transponder:

It alters the frequency of the incoming signals and amplifies them before re-transmitting it to Earth.

Propulsion System:

It is a rocket that propels the satellite.

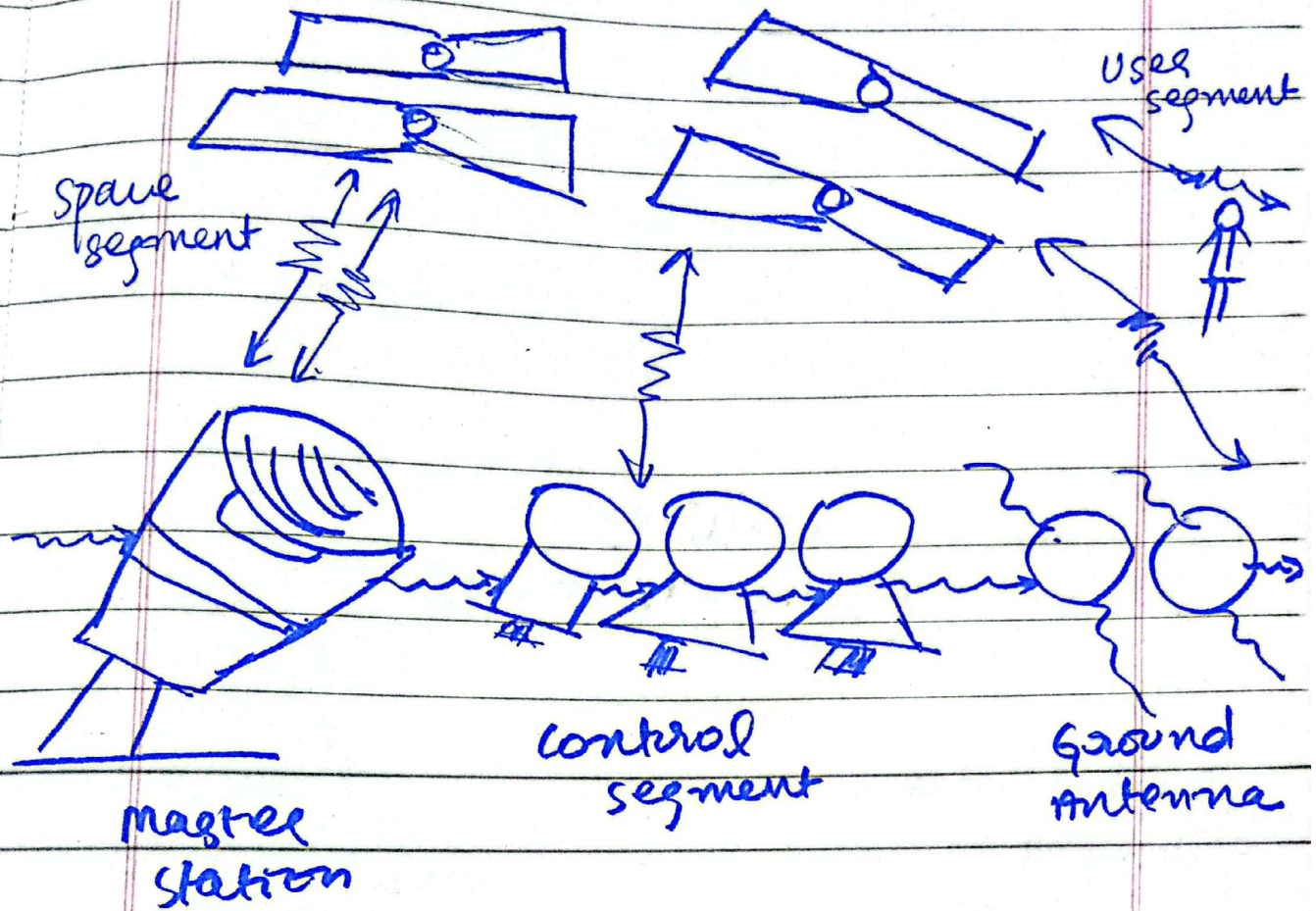


→ "Artificial satellite"

Working Principle of GPS:

GPS is a global positioning system that consists of space segment, control segment and user segment. GPS works on the

principle "triangulation or trilateration".



- (i) Satellite that orbits the Earth transmit signals to the control segment on the ground.
- (ii) The control segment on ground monitors the satellite analyze it and give commands to it.
- (iii) The user on ground receives signals from the satellite.

(iv) The signal is triangulated on the basis of altitude, longitude, and latitude.

(v) By the process of triangulation or continuous tracking the receiver decodes the signals and find its exact location.

Satellites (Transmits signals)

signal decodes
& changed in
map,
direction,
navigation
etc.

User receives
the signals

Triangulation
process

"Triangulation
principle"

- Intersection of longitude, altitude, and latitude
- Pinpoint the exact location of user on map
- Calculates the distance that required by signal from satellite in reaching to user.

Day: _____ Date: _____
(D)

RAM

ROM

It is defined as
the read only
memory.

It is defin

(D)

RAM

ROM

(i)

It is defined as
random access
memory.

It is defined as
read only
memory.

(ii)

It is volatile.

It is non-
volatile.

(iii)

It remains as
long as power is
supplied.

It remains even
if power is
not supplied.

(iv) It is costlier.

It is cheap.

(v) It can read only.

It can read and write both.

(vi) It is the primary memory.

It is the secondary memory.

(vii) It is directly accessed by CPU.

It can not be directly accessed by CPU.

(viii) It stores data for temporary use.

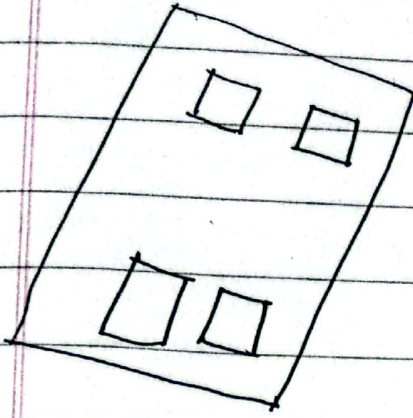
It stores data for longterm use.

(ix) It has high speed

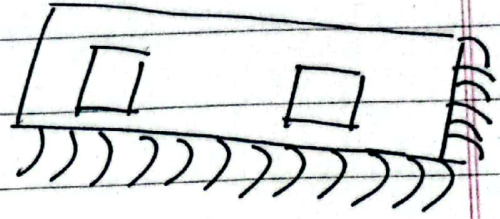
It has lower speed.

(x) It has higher capacity

It has lower capacity.



"RAM"



"ROM"

Q. NO 2:

(A)

Two number ratio = 3:5

Let it be = $3x : 5x$

If 9 is subtracted

$$3x - 9$$

$$5x - 9$$

New Number as per the question

$$3x - 9 = 12$$

$$5x - 9 = 23$$

Let the ratio be

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

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

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

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

$$9x = 99$$

$$\frac{9x}{9} = \frac{99}{9}$$

$$\boxed{x = 11}$$

Smallest Number

$$3x = 3(11) = 33$$

$$\boxed{\text{Answer} = 33}$$

(B)

Profit Sharing Ratio = 5 : 7 : 8

Investment time = 14 : 8 : 7

Ratio of Investment = Profit \times TimeProfit Sharing Ratio = $5x : 7x : 8x$

Now applying formula

$$5x \times 14 = 7x \times 8 : 8x \times 7$$

$$70x = 56x : 56x$$

Let it divide with the longest duration of investment to find ratio of investment

$$5 \frac{70x}{14} : \frac{56x}{14} : \frac{56x}{14}$$

$$\boxed{\text{Final Ratio} = 5 : 4 : 4}$$

Day: _____
(C)

Average weight of A, B, C = 45 kg

This means

$$\frac{A+B+C}{3} = 45 \text{ kg}$$

$$A+B+C = 45 \times 3$$

$$A+B+C = 135 \rightarrow \text{eq (1)}$$

Now

Average weight of A+B = 40 kg

This means

$$\frac{A+B}{2} = 40$$

$$A+B = 40 \times 2$$

$$A+B = 80$$

Then

weight of B and C = 43 kg

It means

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

$$B + C = 43 \times 2$$

$$B + C = 86 \text{ kg}$$

Now,

Weight of B = ?

$$A + B = 80$$

$$B + C = 86$$

$$A + 2B + C = 166$$

Now

~~$$A + 2B + C = 166$$~~

~~$$A + B + C = 135$$~~

- - - -

$$\boxed{B = 31}$$

The weight of B = 31

$$\boxed{\text{Answer} = 31}$$

(D)

Let the positive number be $= x$

The equation for a positive number when increased by 17 is equal to 60 times the reciprocal of number

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

By multiplying "x" on both sides

$$(x + 17)x = 60 * \frac{1}{x} * x$$

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

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

Now applying quadratic formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$a = 1$$

$$b = 17$$

$$c = -60$$

Now putting values in equation

$$x = \frac{-17 \pm \sqrt{(17)^2 - 4(1)(-60)}}{2(1)}$$

$$x = \frac{-17 \pm \sqrt{(17)^2 + 240}}{2(1)}$$

$$x = \frac{-17 \pm \sqrt{289 + 240}}{2}$$

$$x = \frac{-17 \pm \sqrt{529}}{2}$$

Now solving for positive numbers

$$x = \frac{-17 + \sqrt{529}}{2}$$

$$x = \frac{-17 + 23}{2}$$

$$x = \frac{6}{2}$$

$$x = 3$$

Negative Number

$$x = \frac{-17 - 23}{2}$$

$$x = \frac{-40}{2}$$

$$x = -20$$

So,

the positive number = +3

Answer = +3