

V. Good! Keep up

Question no: 01

Part c):

let the share of A is $5x$, B is $2x$, C is $4x$ and D is $3x$.

if C gets Rs. 1000 more than D;

$$4x + 1000 = 3x$$

$$4x - 3x = 1000$$

$$x = 1000$$

$$\text{Share of B} = 2x$$

Putting the value of x in above equation

$$\text{Share of B} = 2x \\ = 2(1000)$$

So, share of B will be 2000

Part (d):

Given data;

40% of a number = $\frac{2}{3}$ of another

let the one number is x , and another number is y .

$$\frac{40}{100} (x) = \frac{2}{3} (y)$$

$$\frac{2}{5} (x) = \frac{2}{3} (y)$$

multiplying both sides of the equation by $\frac{5}{2}$.

$$\frac{5}{2} \times \frac{2}{5} (x) = \frac{2}{3} (y) \times \frac{5}{2}$$

$$\frac{x}{y} = \frac{2 \times 5}{3 \times 2}$$

$$\frac{x}{y} = \frac{10}{6}$$

$$\frac{x}{y} = \frac{5}{3} \Rightarrow x:y = 5:3$$

So the ratio of first number to the second number is $5/3$.

Part (b) :

Given data:

$$\text{Sum of } 5\% \text{ of } A \text{ and } 4\% \text{ of } B = \frac{2}{3} (6\% \text{ of } A + 8\% \text{ of } B)$$

$$\text{So, } \frac{5}{100} A + \frac{4}{100} B = \frac{2}{3} \left(\frac{6}{100} A + \frac{8}{100} B \right)$$

$$\frac{1}{20} A + \frac{1}{25} B = \frac{2}{3} \left(\frac{3}{50} A + \frac{2}{25} B \right)$$

$$0.05A + 0.04B = \frac{2}{3} (0.06A + 0.08B)$$

$$3(0.05A + 0.04B) = 2(0.06A + 0.08B)$$

$$= 0.15A + 0.12B = 0.12A + 0.16B$$

Rearranging the above Equation

$$= 0.15A - 0.12A = 0.16B - 0.12B$$

$$= 0.03A = 0.04B$$

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Dividing both sides by 0.03

$$\frac{0.03A}{0.03} = \frac{0.04B}{0.03}$$

$$\frac{A}{B} = \frac{0.04}{0.03} = \frac{4}{3}$$

Therefore,

The ratio of A:B is 4:3.

Part (a):

Given data:

First counts the numbers in 1 unit digit are:

1, 11, 21, 31, 41, 51, 61, 71

There are 7 total numbers

Numbers that end in 9 unit digit are;

9, 19, 29, 39, 49, 59, 69

these numbers are also 7 in total.

Hence, the total numbers that end in 1 and 9 unit digit are = 14

To find percentage of a number = $\frac{\text{given nb}}{\text{total nb}} \times 100$

$$= \frac{14}{70} \times 100$$

$$= 20\%$$

So, 20% of the numbers from 1 to 70 have 1 or 9 in the unit's digit.

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Part (b):

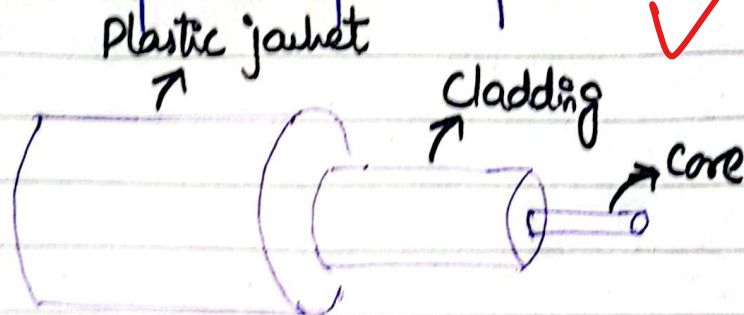
Optical fibre

Definition:

A thin, flexible strand of glass or plastic that transmits light signals from one place to another is termed as optical fibre.

In other words, it is a wire-like cable that is used to transmit information (data) in the form of light waves instead of electrical signals.

Structure of an optical fibre:



An optical fibre is basically a combination of core and cladding.

- Core is a cylindrical dielectric, made up of glass through which light propagates.
- Core is enclosed in a plastic cladding which reduces the signal losses due to scattering.

The whole assembly of core and cladding is surrounded by an elastic jacket in order to protect the fibre.

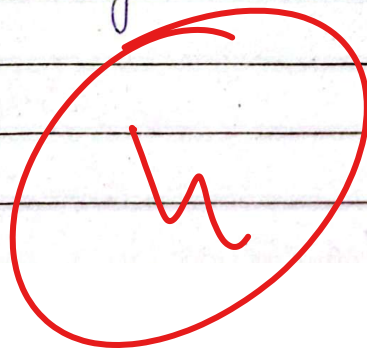
Working Principle of an Optical fibre:

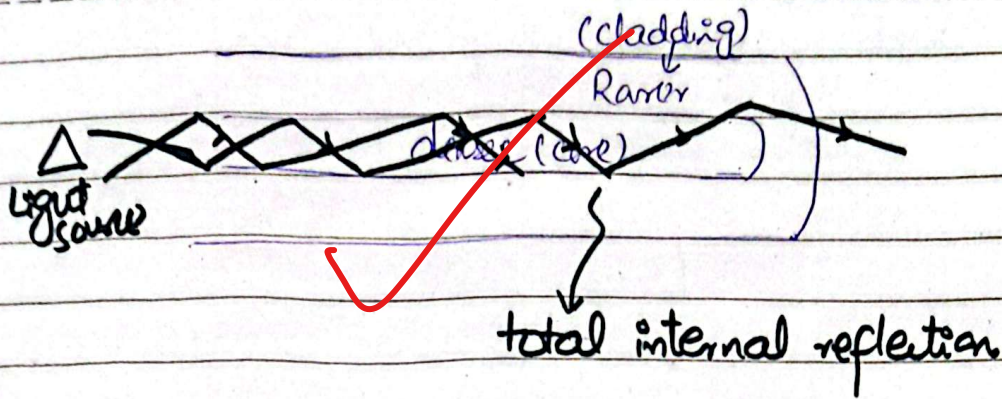
Optical fibres allow the propagation of the signals in the form of light. It works on the principle of **total internal reflection**.

When light travels through an optical fibre, it is propagated only through the core, by experiencing continuous reflections from the cladding.

Total internal reflection occurs only when light incident from a denser to a rarer medium with the angle of incidence greater than the critical angle.

As light travels only through the core, then only a small reflection of the light ray will take place. Hence, it causes the incident angle to be greater than critical angle.





Part (c):

Working of a Cell Phone

A cell phone is a device that allows wireless communication using radio waves. It works through a network of cell towers and satellites to send and receive text, voice and data signals.

Basic principle of a cell phone:

Cell phones convert voice into electrical signals, which are then changed into radio waves and are transmitted through the air to the nearest cell tower.

These waves are then passed through the network system to reach the receiver's phone, where they are converted back into sound.

Working of a cell phone

Voice Conversion

✓ Voice converted to digital signals by microphone and processor

↓
Signal transmission

✓ ↳ phone send these signals as radio waves to the nearest cell tower

↓
Network Switching

✓ ↳ tower send the signals to the mobile switching centre, directing it to nearest receiver tower

↓
Signal Reception

✓ ↳ Receiver's phone gets the radio signals from its nearby tower and convert it back into sound through signals

Part (d) :

a) RAM and ROM

Both are types of computer memory.

RAM stands for Random access memory.

✓ It is a temporary memory and is volatile meaning thereby is data is lost when power is off.

Used by central processing unit to run programs and process data quickly.

So for quicker access, data is loaded into RAM to open files and apps.

RAM stands for read only memory. It is a permanent memory that stores data to start and operate the device. It is non-volatile - that is data retained even when computer is power off.

Mostly it stores system software, data cannot be deleted or changed.

b) Software and Hardware

Software is a set of programs or instructions that tell the hardware how to perform any function.

It gives instructions to hardware and can get corrupted.

For example, windows, ios, ms-word, Drives

Hardware refers to all physical parts of a computer or device that can be seen or touched. It works based on the instructions of software.

Example:

monitor, keyboard, mouse, CPU.

c) Computer bus

It is a communication system inside a computer that transfers data, instructions and signals between various parts of a computer like memory, input/output devices etc.

It is a channel through which a data travels inside a computer.

3 Main functions of Computer bus:

- ✓ Transfer data b/w CPU, memory and peripherals
- ✓ Send signals to manage operations
- ✓ Carries memory address for data storage and retrieval.

Part (a):

Satellite Launch:

Launching a satellite means sending it from Earth into space so it can orbit around the Earth or any other planet.

To launch a satellite, first it is attached to a rocket (carries the

satellite into space).

when rocket lifts off, it is pushed against gravity using thrust from burning fuel. The rocket keeps going up until it crosses about 100 km above Earth. Once the desired altitude and speed is reached, the satellite is released into space.

The satellite then settles into a stable orbit around the Earth.

Working Principle of Global Positioning System:

The Global Positioning System (GPS) is a satellite-based navigation system that tells an exact location anywhere on Earth.

GPS works on the principle of trilateration - i.e. by measuring distance from at least 3 or 4 satellites.

Satellites orbit and send signals ✓

↓
Receiver collects signals from satellites ✓

↓
measures time delay of each signal ✓



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Calculates distance from
each satellite ✓



Trilateration process determines
position ✓



Position displayed on map
or screens ✓

