

QUESTION #01

PART A:

Numbers containing 1 or 9 at units digit from 1 to 70 are

1, 9, 11, 19, 21, 29, 31, 39, 41, 49, 51, 59, 61, 69

So number with 1 or 9 at units = 14

Total numbers = 70.

$$\begin{aligned}\text{Percentage of number containing 1 or 9 at digit from 1-70} &= \frac{\text{Numbers}}{\text{Total numbers}} \times 100 \\ &= \frac{14}{70} \times 100 \\ &= 20\%\end{aligned}$$

So, 20% of numbers from 1 to 70 contain 1 or 9 at unit digit.

X ————— X

PART B:

According to the given statement

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

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

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

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

$$\frac{5A + 4B}{100} = \frac{12A + 16B}{300}$$

By cross multiplication we get:

$$300(5A + 4B) = 100(12A + 16B)$$

$$1500A + 1200B = 1200A + 1600B$$

$$1500A - 1200A = 1600B - 1200B$$

$$300A = 400B$$

$$\frac{A}{B} = \frac{400}{300}$$

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

So A : B is equal to 4 : 3.

X ————— X

PART C:

According to given statement,

$$A : B : C : D$$

$$5 : 2 : 4 : 3$$

and

$$\text{Share of } C = D + 1000 \text{ ——— ①}$$

Using proportion of the statement; the total amount is 'x', or share of C is:

$$\text{share of } C = \frac{4}{9} \times x = 4x$$

$$\text{or Share of } D = 3x$$

putting values in eqn ①

$$C = D + 1000$$

$$4x = 3x + 1000$$

$$4x - 3x = 1000$$

$$x = 1000$$

So Now,

$$\text{share of } B = 2x = 2 \times 1000 = 2000$$

So Hence, share of B is Rs 2000-
 $x \text{ ————— } x$

PART D:

As given in statement of question, let first number be 'x' and second one be 'y'. so,

$$40\% x = \frac{2}{3} \times y$$

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

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

By cross-multiplication we get:

$$3(40x) = 2y(100)$$

$$120x = 200y$$

$$\text{or } \frac{x}{y} = \frac{200}{120}$$

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

Hence, the ratio of 1st number to second one is 5:3.

$\frac{X}{X} = \frac{X}{X}$

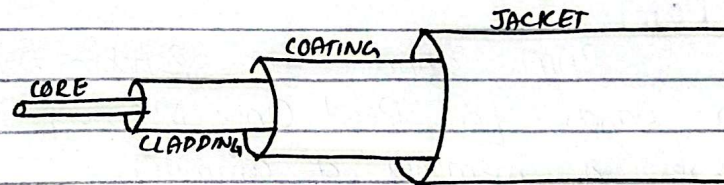
QUESTION #2

PART B: (OPTIC FIBER)

1- FIBER OPTIC:

It is a bundle of thin strands made up of glass or plastic which use light to transmit signal from one place to another. Optic fibers are readily used for communication purpose. Its basic structure consists of:

- i - Core which is made up of glass.
- ii - Cladding which is a reflective layer made up of either glass or plastic.
- iii - Coating - a protective layer.
- iv - Jacket - which bundles all fibers in one cable.



Optic fiber can either be single-mode, that is, carry one signal at a time or multi-mode, that is, carry more than one signals at a time.

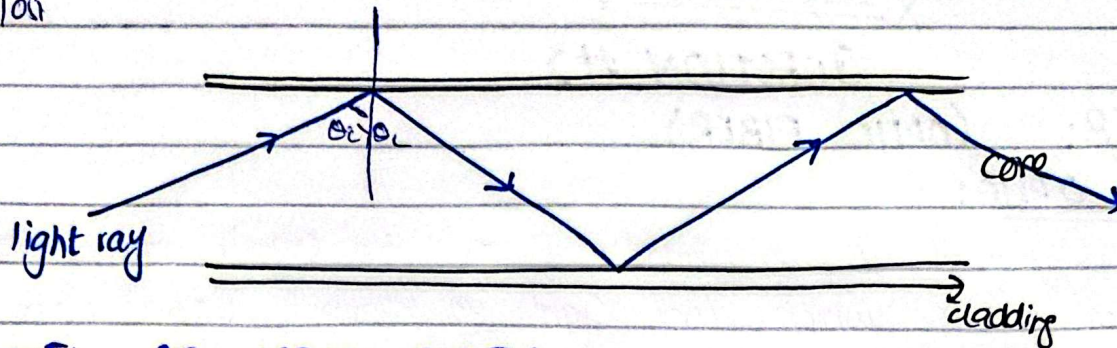
2- WORKING PRINCIPLE OF OPTICAL FIBER:

Optical fiber uses light as a mean to transmit signal and involves two process for propagation of signal which are.

- i - Total internal reflection.
- ii - Continuous refraction.

Light entering the core through transmitter moves along the length of optic fiber. The core has high refractive index than the cladding. When light enters the core, it travels through the denser medium. When it strikes the boundary between the core and the cladding, light travels from denser medium to lighter medium and hits cladding at an angle greater than critical angle. Both these conditions are necessary for total internal reflection. Hence, the light ray is reflected back into the core. This process repeats continuously, causing the

light to bounce along the entire length without significant loss



3- USES OF OPTICAL FIBER:

Optic fibers are largely used in communication over longer distance. It is used in telephone and internet, local computer network, endoscopy, automotive industry, power industry etc.

X ————— X

PART D: (SHORT NOTES)

1- RAM AND ROM:

RAM stands for Random Access memory while ROM stands for Read Only Memory. Both are different types of memories of computer. RAM is a volatile memory which can store data as long as power is supplied. Data stored on RAM can be stored and altered. It is used to store data that has to be currently processed by C.P.U temporarily. It is usually a high-speed memory. RAM has larger size with higher capacity and is costly. On the other side, ROM is non-volatile memory that can retain data even when the computer is powered off. From ROM, data can only be read. It stores instructions required during the bootstrap of the computer. ROM is much slower than RAM. It is smaller size with smaller capacity. ROM is cheaper than RAM.

X ————— X

2- SOFTWARE & HARDWARE:

There are two parts of a computer namely software and hardware. Hardware are the physical parts of a computer while software are intangible that cannot be touched. Hardware are developed using electronic and other materials while software are developed using programming language. Input, output and storage devices constitute hardware but system software and application software are two types of software. Hardware failure result due to physical damage or electrical failure. On other hand, software failure occur due to bugs, software corruption or compatibility issues. Hardware wear out physically over time but software do not wearout physically but can be affected by bugs or glitches. Hardware provide physical means to perform computing tasks and software provides the instructions and controls for hardware to execute tasks. Examples of hardware are monitor, scanner, printer, keyboard etc. while examples of software include microsoft word, internet explorer, calculator etc.

X ————— X

3- COMPUTER BUS:

A computer bus is a communication system that transfers data and signals between components inside a computer or between computers. It allows different parts of computer to function efficiently. There are three different types of computer buses namely Address bus, data bus and control bus. Address bus carries data from RAM or I/O from C.P.U. to read from or write to. Data bus carries actual data being transferred between C.P.U. and other components of computer. Control bus carries/controls signals that coordinate activities of all components. So, by the help of computer buses, the system functions efficiently and in a coordinated way.

X ————— X

PART C: (WORKING OF CELL PHONE)

1- CELL PHONE:

Cell phone is a portable telephonic device that uses cellular data to make and receive calls.

2- WORKING OF CELL PHONE:

Working of a cell phone consists of

3 steps.

i - Radio waves

ii - Antenna.

iii - Connectivity

Radio waves are used to communicate on cell phone. The electromagnetic field transport digitized audio or data via radio wave. Radio waves convey data and travel at the speed of light across the air. The signals are received by cell phones through radio antenna. The antenna converts an electrical signal into radio wave and other way around.

X ——— X

PART A: (SATELLITE AND GPS)