

DAY: Wednesday

DATE: 29 Oct, 2025

NOA TEST SERIES

Tehreem Javed

NOA BATCH: OB-001-NTS 26

Subject: General science and Abilities.

Question # 01

(Two marks)

(b)

Two number A and B are such that the sum of 5% of A and 4% of B is two third of the sum of 6% of A and 8% of B. Find the ratio A:B

Solution:

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

→ Convert percentages to decimals:

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

→ To eliminate decimal, multiply both sides by 100:

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

DAY: _____

DATE: _____

Multiply both sides by 3 :

$$15A + 12B = 2(6A + 8B)$$

$$15A + 12B = 12A + 16B$$

Re-arrange the equation:

$$15A - 12A = 16B - 12B$$

$$3A = 4B$$

So,

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

So, the ratio of A:B is 4:3.

(d)

If 40% of a number is equal to two-third of another number, what is the ratio of first number to second number?

Solution:

Let's denote first no. as A

DAY: _____

DATE: _____

and second number is B

Given:

$$40\% \text{ of } A = \frac{2}{3} \text{ of } B$$

Convert percentage into decimal:

$$0.04A = \frac{2}{3}B$$

To eliminate decimals, multiply by 10

$$4A = \frac{20}{3}B$$

Multiply both sides by 3

$$12A = 20B$$

$$\frac{A}{B} = \frac{20}{12}$$

$$\frac{A}{B} = \frac{5}{3}$$

So, the ratio of first number (A) to second number (B) is 5:3.

DAY: _____

DATE: _____

Question # 02

(D)

SHORT NOTE ON FOLLOWING.

- a) RAM and ROM
- b) Software and hardware
- c) Computer Buses

Answer:

Hardware :

Hardware refers to the physical parts of computer and related devices. Hardware is used to run the software.

Internal devices include the (monitor) hard drive, the motherboard, the video and sound cards while external devices include monitor, the printer, scanner, the keyboard and the mouse.

Removable storage i.e. USB, CD, DVD Rom are also the examples

DAY: _____

DATE: _____

of hardware. External devices of computer are also called peripheral devices. Computer hardware can be classified into:

- i) Input Devices
- ii) Output Devices
- iii) Storage and processing devices.

Software :

Software is that part of computer that consists of encoded information or computer instruction in contrast to the physical hardware from which system is built. The term software was first proposed by Alan Turing and used in this sense by John W. Tukey in 1957.

Computer Software includes computer programmes, libraries and related non-executable data, such as

online documentation or digital media.

Computer software can be divided
(by) into :

- i) Application software
- ii) System software.

Application software:

Software that uses the computer system to perform special functions beyond the basic operation of computer itself. There are many different types of application software, such as business applications, office, entertainment and learning applications.

System Software:

Software that directly operates the computer hardware, to provide basic functionality needed by users and other software and to provide

a platform for running application software.

a) Read-Only Memory (ROM)

ROM is a memory containing hard wired instructions that the computer uses when it boots up. Before the system software loads in the computer, the instructions are read from a small programme in ROM called "Bios". The ROM can only be read by the CPU but it cannot be changed. ROM is a non-volatile memory.

Random Access Memory (RAM)

RAM recieved its name from its ability to directly access any memory cell. RAM is made up of small memory chips that form a memory

module. These modules are installed in the RAM slot on the motherboard of computer.

RAM is temporary storage as data only remains there when machine is running. When we shut down the computer RAM loses all of its data.

(c) Computer Buses

A bus consists of sets of parallel lines. It is used to transfer data between different components of the computer. One-line bus can transfer one bit at a time. The capacity of computer Bus depends on the number of data lines in it. A bus with 16 lines can carry 16 bits or bytes.

CPU communicates with other components

DAY: _____

DATE: _____

of computer through buses.

(b)

Optical Fibers and its Working.

Answer:

Outline :

Introduction:

Types of optical Fibere

How does fibre optic communication works ?

Fibre optic cable advantages

Disadvantages

Uses

Conclusion.

Introduction:

Optical Fiber refers to the medium and the technology associated with the transmission of information as

DAY: _____

DATE: _____

light pulses along a hollow glass tube or plastic wire or fiber. Fiber optics is the branch of science that deals with optical fibers.

If light hits glass at a really shallow angle (less than 42°), it reflects back in again as though the glass were really a mirror. This phenomenon is called total internal reflection. It's one of the things that keeps light inside the pipe.

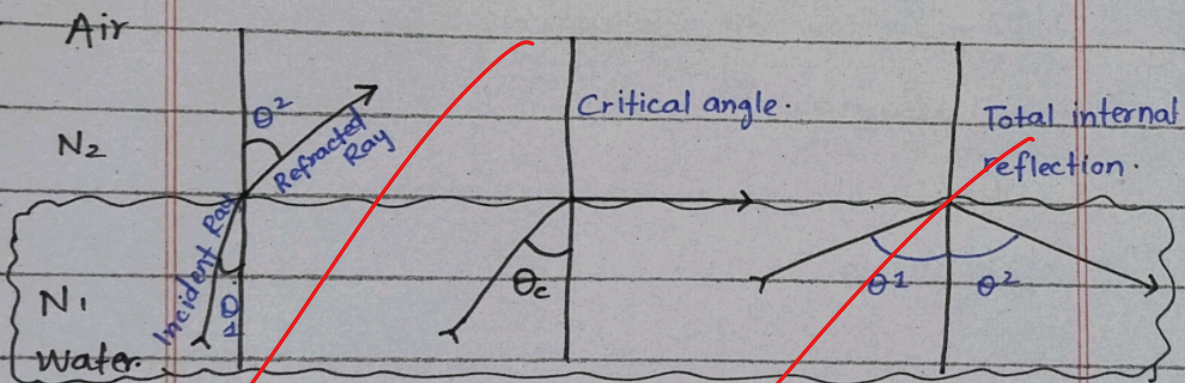


Figure : Total Internal reflection.

Types of optical Fiber:

The optical fibers are classified into two types

- i) Single mode fibers
- ii) Multimode fibers.

The basic structural difference is the core size.

i) Single mode fibers.

Optical fiber that is designed to carry a single signal at a time. It is used mainly for long distance signal transmission.

ii) Multimode fibers:

Multimode fibers is designed to carry $\propto$ (~~single~~^x signal) more than one signal at a time. It is used for relatively short distances because the mode tend to disperse over long lengths.

How does fiber optic communication works?

Unlike copper wire based transmission where transmission entirely depends on electrical signals passing through the cable, the optic fiber transmission involves transmission of signals in the form of light from one point to the other.

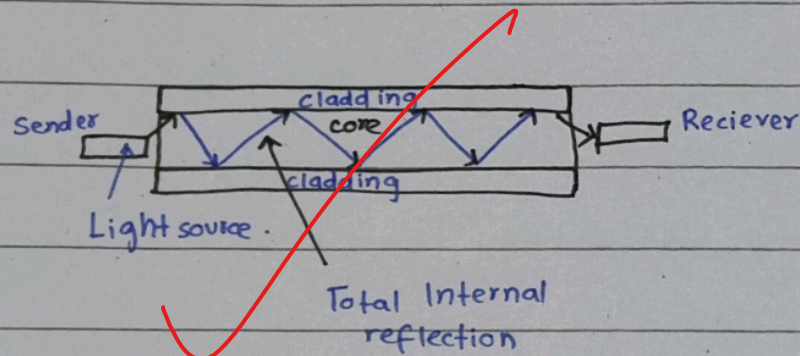


Figure: Fiber Optic communication.

When the input data, in the form of electrical signals, is given to the transmitter circuitry, it converts

DAY: _____

DATE: _____

them into light signal with the help of a light source. This source is of LED whose amplitude, frequency and phases must remain stable and free from fluctuation in order to have efficient transmission. The light beam from the source is carried by fibre optic cable to the destination circuitry wherein the information is transmitted back to the electrical signal by receiver circuit.

The receiver circuit consists of a photo detector along with an appropriate electronic circuit, which is capable of measuring magnitude, frequency and phase of optic fiber. Both LED and Laser can be used as light sources based on application.

Advantages:

Safety: Since fiber is dielectric, it does not present a spark hazard.

Flexibility: It has greater tensile strength than copper or steel fibers of same diameter. It is flexible and bends easily.

Cost: The raw material for glass are plentiful, unlike copper. This means glass can be made more cheaply than copper.

Disadvantages:

Transmission:

Transmission on optic fibers requires repeating at distance intervals.

DAY: _____

DATE: _____

Protection:

Optical fibers requires more protection around the cable as compared to copper.

Uses:

- ✓ Telecommunication uses
- ✓ Medical uses
- ✓ General uses.

Conclusion:

Optical fiber technology has transformed the way we communicate- and transmit data, offering high speed, reliable and secure connections over long distances. With its ability to handle high bandwidth, it plays crucial role in modern telecommunications.