

How an optical fibre is constructed? How is it helpful in transmitting the electromagnetic radiation?

OPTICAL FIBRE

Optical fibre refers to the medium and the technology associated with the transmission of information as light pulses along a hollow glass tube or plastic wire or fibre.

CONSTRUCTION OF AN OPTICAL FIBRE

Optical fibre construction is based on four parts.

- 1- Core
- 2- Cladding
- 3- Buffer
- 4- Jacket.

Core

The core is generally made of thin glass. Center of fibre where light travels.

Cladding

Cladding is also glass or plastic, outer optical material surrounded by core.

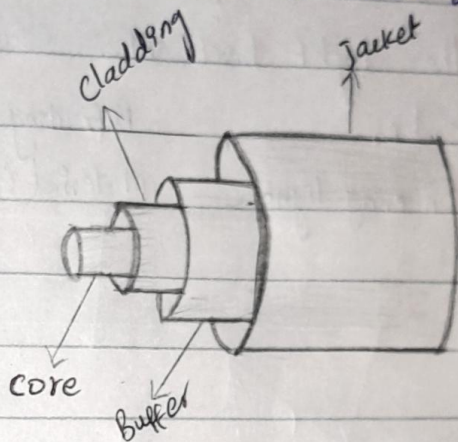
Buffer

Buffer is polymer layer, surrounded by cladding

Jacket

Polymer layer, which coats or covers whole material.

Optical fibre Structure



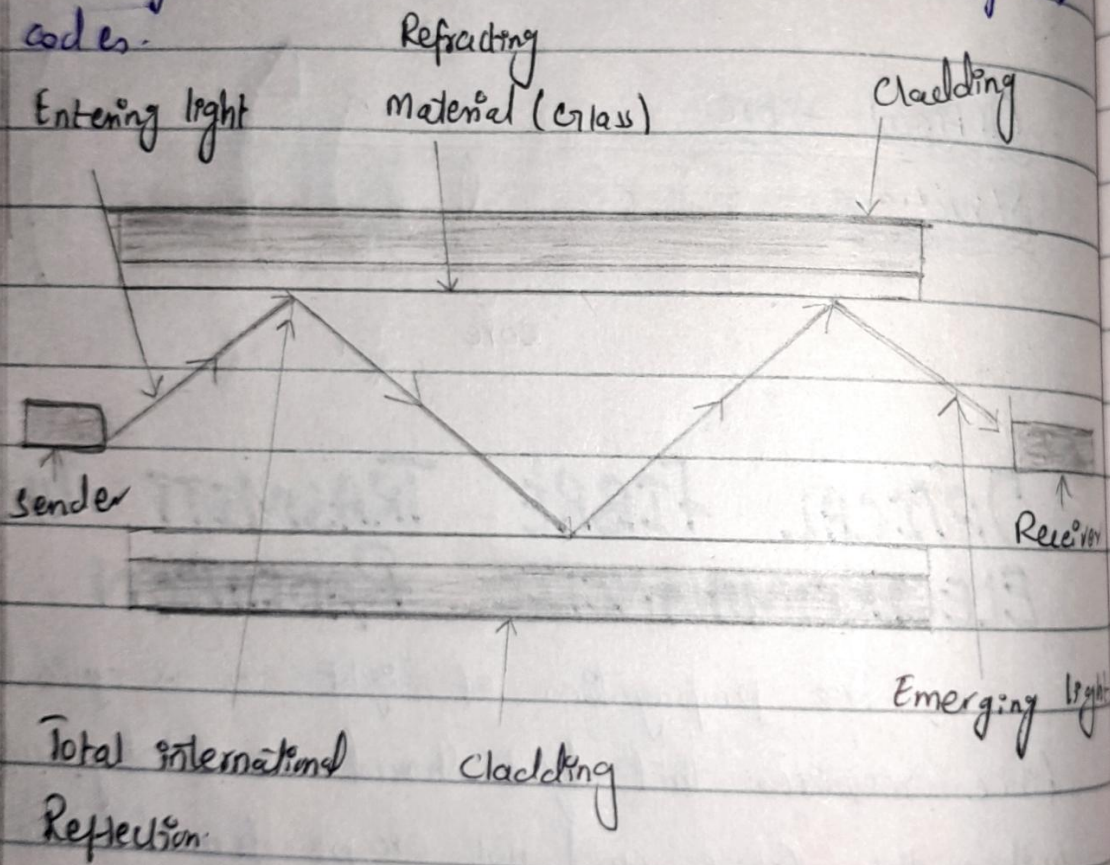
OPTICAL FIBRE TRANSMIT THE ELECTROMAGNETIC RADIATION

The propagation of light in an optical fibre requires that light should be totally confined within the fibre and not escape from it. This can be done by

- (i) Total internal reflection
- (ii) Continuous Refraction

In fibre-optic system, a machine called a transmitter turns information into the light. Then the transmitter sends the light through optical fibres. As the light moves at a high speed through the core, it bounces off the cladding either by the phenomenon

of total internal reflection or continuous refraction. If the fibre has a bend in it, the light can bounce off the cladding and turn the corner to follow the bend. At the end of the fibres, a machine called a receiver accepts the light. The receiver turns the light back into sound, pictures, or computer codes.



Fibre Optic Transmitting

Q.19) Give a brief account of optic fibres. What is their importance in the present day telecommunication system?
Optical fibre. Construction of optical fibre
Note: first part answer is given in previous question and second part is given below

Importance of Optical fibre in the Present day telecommunication system

In present-day telecommunication, fibre optics is used widespread due to a number of reasons.

- 1- Much lower levels of signal attenuation
- 2- Fibre optics provides a much higher bandwidth allowing more data to be delivered.
- 3- They are much lighter than the coaxial cables that might otherwise be used.
- 4- Fibre optics does not suffer from stray interference pickup that occurs with coaxial cabling.