

Fiber Optics

Module 1: Fiber Optics Material

1) Which material has the lowest loss and longest transmission distance?

- A) Fiberglass
- B) Plastic Fiber
- C) Silicone rubber Fiber cladding
- D) Copper wire

2) Which type of optical Fiber is most commonly used in home appliances?

- A) Fiberglass
- B) Silicone rubber Fiber cladding
- C) Plastic Fiber
- D) Single mode Fiber

3) What color is the outer sheath of single mode Fibers?

- A) Yellow
- B) Orange
- C) Blue
- D) Green

4) Multimode Fibers typically have a core diameter of:

- A) 910 micrometers
- B) 5062)5 micrometers
- C) 100 micrometers
- D) 1 millimeter

5) Single mode Fibers can transmit light in multiple modes.

- True
- False

6) Plastic Fibers are used for long distance communication.

- True
- False

7) Match the Fiber type with its characteristic.

Single mode Fiber

Multimode Fiber

8) Match the Fiber type with its use.

Plastic Fiber

Fiberglass

9) Which of the following are characteristics of silicone rubber Fiber cladding? (Select all that apply)

A) Glass core

B) Plastic cladding

C) Low cost

D) High loss

10) Select the correct statements about multimode and single mode Fibers. (Select all that apply)

A) Multimode Fibers have thicker cores

B) Single mode Fibers are used for long distance communication

C) Multimode Fibers are used in telephone networks

D) Single mode Fibers have more dispersion

Module 2: How do Optical Fibers work?

1) What principle allows light to travel through bends in optical Fibers?

- A) Refraction
- B) Total internal reflection
- C) Diffraction
- D) Absorption

2) The part of the Fiber Optic system that encodes the optical signal is called:

- A) Receiver
- B) Transmitter
- C) Cladding
- D) Core

3) What modulation method involves changing the light signal intensity up or down?

- A) Digital modulation
- B) Analog modulation
- C) Frequency modulation
- D) Phase modulation

4) Which part of the Fiber Optic system converts the optical signal back to an electrical signal?

- A) Core
- B) Cladding
- C) Transmitter
- D) Receiver

5) Impurities in the glass core can absorb part of the light signal.

- True
- False

6) Optical signals can be intercepted easily.

- True
- False

7) Match each part with its function.

- Transmitter
- Receiver

8) Match the modulation type with its description.

- Analog modulation
- Digital modulation

9) Which of the following are advantages of optical Fibers? (Select all that apply)

- A) High bandwidth
- B) Low signal loss
- C) Electromagnetic interference
- D) High cost

10) Select the correct statements about the light path in optical Fibers. (Select all that apply)

- A) Light travels in straight lines
- B) Mirrors are used at bends to reflect light
- C) Total internal reflection keeps the light in the core
- D) Light signals always lose a part of their intensity

Module 3: How to make optical Fibers?

1) What process is used to create the glass cylinder for optical Fibers?

- A) Chemical Vapor Deposition
- B) Thermal Deposition
- C) Mechanical Molding
- D) Electrolysis

2) At what temperature range is the glass cylinder heated to pull Fibers?

- A) 1000-1200 degrees Celsius
- B) 1400-1600 degrees Celsius
- C) 1900-2200 degrees Celsius
- D) 2500-2800 degrees Celsius

3) Which material is NOT used in the formation of the glass cylinder?

- A) Silicon chloride
- B) Germanium chloride
- C) Oxygen
- D) Iron oxide

4) What is the typical pulling rate for drawing optical Fibers?

- A) 12 M/s
- B) 510 M/s
- C) 1020 M/s
- D) 2030 M/s

5) The purity of the glass can be controlled during the manufacturing process.

- True
- False

6) Optical Fibers are tested for endurance and resistance to tension.

- True
- False

7) Match each stage with its description.

- Unshaped glass cylinder
- Drawing device

8) Match the testing criteria with its purpose.

- Refractive index → Ensures proper light transmission
- Geometric shape → Maintains Fiber consistency

9) Which of the following chemicals are used in the Modified Chemical Vapor Deposition process? (Select all that apply)

- A) Silicon chloride
- B) Germanium chloride
- C) Oxygen
- D) Hydrogen chloride

10) Select the correct statements about the Fiber pulling process. (Select all that apply)

- A) The glass is heated until it melts
- B) Fibers are wrapped continuously while being pulled
- C) The pulling rate is measured with a laser micrometer
- D) Fibers are pulled from a metal cylinder

Module 4: Use optical Fibers?

1) Compared to copper cables, optical Fibers are:

- A) More expensive
- B) Heavier
- C) Easier to construct
- D) Less durable

2) Which wavelength is NOT typical for optical Fiber transmission?

- A) 850 nanometers
- B) 1310 nanometers
- C) 1550 nanometers
- D) 600 nanometers

3) The signal loss in a 10kilometer optical Fiber is generally:

- A) Less than 1 decibel
- B) Less than 3 decibels
- C) Around 5 decibels
- D) More than 10 decibels

4) Optical Fibers are particularly suitable for:

- A) Short distance communication
- B) High capacity, long range communication
- C) Low security applications
- D) High electromagnetic interference environments

5) Optical Fibers produce electromagnetic radiation.

- True
- False

6) The cost of manufacturing optical Fibers is generally lower than that of copper cables.

- True
- False

7) Match the wavelength with its typical use.

- 850 nm
- 1310 nm

8) Match each advantage with its description.

- High transmission rate
- High safety

9) Which of the following are reasons optical Fibers have replaced copper cables? (Select all that apply)

- A) Lower cost
- B) Higher transmission rate
- C) Higher weight
- D) Higher signal loss

10) Select the correct statements about optical Fiber advantages. (Select all that apply)

- A) They are not affected by electromagnetic radiation
- B) They are more reliable than wireless signals
- C) They are heavier than copper cables
- D) They have high bandwidth

Module 5: Optical Fiber Systems

1) Which component amplifies the optical signal in long distance communication?

- A) Transmitter
- B) Optical amplifier
- C) Receiver
- D) Modulator

2) What device is used to combine multiple wavelengths into a single Fiber?

- A) Optical amplifier
- B) Multiplexer
- C) Modulator
- D) Filter

3) Which type of multiplexer is used for combining different optical signals?

- A) Wavelength division multiplexer
- B) Time division multiplexer
- C) Frequency division multiplexer
- D) Code division multiplexer

4) What is the main function of an optical transceiver?

- A) To transmit only
- B) To receive only
- C) To amplify signals
- D) To transmit and receive signals

5) An optical transceiver is a bidirectional device.

- True
- False

6) Wavelength division multiplexing (WDM) increases the Fiber's capacity.

- True
- False

7) Match each component with its function.

- Optical amplifier
- Transceiver

8) Match the type of multiplexer with its use.

WDM

TDM

9) Which of the following components are found in an optical Fiber system? (Select all that apply)

A) Multiplexer

B) Demultiplexer

C) Optical amplifier

D) Electrical amplifier

10) Select the correct statements about wavelength division multiplexing. (Select all that apply)

A) It combines multiple wavelengths into a single Fiber

B) It uses different time slots for signals

C) It increases bandwidth

D) It is used in TDM systems