

1. The refractive index of the core is \_\_\_\_\_\_\_\_ the cladding in a step-index multimode optical fiber.

(A) Smaller than

(B) Greater than

(C) Equal to

(D) Proportional to

2. A fiber with a V-number less than 2.405 is most likely a \_\_\_\_\_\_\_\_.

(A) Step-index

(B) Plastic

(C) Single-mode

(D) Multi-mode

3. What is the critical angle when the refractive index of the core and cladding are 1.48 and 1.00, respectively?

(A) 60°

(B) 42.5°

(C) 90°

(D) 65.8°

4. Meridonal rays are the rays that \_\_\_\_\_\_\_\_.

(A) Pass around the core

(B) Go out of the core

(C) Are never guided by the core

(D) Cross the optical axis

5. The core refractive index is 1.48, and the cladding refractive index is 1.46. What is the value of the numerical aperture?

(A) 0.354

(B) 0.455

(C) 1.550

(D) 0.242

6. Scattering loss in glass arises from \_\_\_\_\_\_\_\_.

(A) Macroscopic variations in material density

(B) Microscopic variations in material density

(C) Refractive variations

(D) Density variations

7. The amount of \_\_\_\_\_\_\_\_ from a bent fiber depends on the field strength at critical distance (X) and the distance of curvature R.

(A) Optical radiation

(B) Absorption

(C) Dispersion

(D) Optical attenuation

8. \_\_\_dispersion occurs in single mode fiber.

(A) Intramodal

(B) Intermodal

(C) Single-mode

(D) Transverse

9. In a 50 km long optical fiber with an attenuation of 0.9 dB/km at 1221 nm and an input power of 400 μW, what is the output power from the fiber?

(A) 32.44 nW

(B) 12.64 nW

(C) 54.78 nW

(D) 30.89 nW

10. An optical fiber has losses of 0.6 dB/km at 1300 nm. If 100 μW of power is launched into the fiber, how much power will reach a distance of 20 km?

(A) 8.6 μW

(B) 6.3 μW

(C) 5.6 μW

(D) 10.3 μW

11. Carrier confinement is used to increase the carrier recombination in \_\_\_\_\_\_\_\_ at the active region of an LED.

(A) Carrier

(B) Optical

(C) Electrical

(D) Signal

12. ----modes are related to the length of the cavity.

(A) Lateral

(B) Transverse

(C) Longitudinal

(D) Elliptical

14. Quantum efficiency is the ratio of \_\_\_\_\_\_\_\_ to the incident photons.

(A) Electron-hole pairs generated

(B) Power efficiency

(C) Carrier efficiency

(D) Quantum efficiency

16. The change in refractive index of a medium due to the presence of a sound wave is called \_\_\_\_\_\_\_\_.

(A) Photoemissive effect

(B) Acoustic optic effect

(C) Electro-optic effect

(D) Magneto-optic effect

17. Kerr effect occurs when the \_\_\_\_\_\_\_\_ coefficient is larger than the linear electro-optic coefficient.

(A) Electric field is zero

(B) Magnetic field is zero

(C) Quadratic electro-optic coefficient is smaller than

(D) Quadratic electro-optic coefficient is larger than linear electro-optic coefficient

18. In a circulator, the optical path of the signal follows \_\_\_\_\_\_\_\_.

(A) An open loop

(B) A closed loop

(C) A forward loop

(D) A reverse loop

19. Fabry-Perot interferometer is used to \_\_\_\_\_\_\_\_.

(A) Determine the resonant modes

(B) Generate electrical signals of a cavity

(C) Determine the refractive index

(D) Determine the output pulse

20. Which of the following is a magneto-optic effect?

(A) Faraday effect

(B) Skin effect

(C) Kerr effect

(D) Pockels effect

21. Circuits fabricated from AlGaAs operate in the wavelength region of \_\_\_\_\_\_\_\_.

(A) 0.1 and 0.2 μm

(B) 0.8 and 0.9 μm

(C) 0.3 and 0.4 μm

(D) 0.6 and 0.7 μm

22. To minimize the OEIC (Optoelectronic Integrated Circuit) chip area, \_\_\_\_\_\_\_\_ devices are used in fabrication.

(A) InGa

(B) GaAs

(C) InGaAs

(D) InGaAsP

23. The sensitivity of a pin-HBT (p-i-n Heterojunction Bipolar Transistor) photoreceiver is proportional to \_\_\_\_\_\_\_\_.

(A) B

(B) B²

(C) B³

(D) B¹³²

24. In a SLAB (Symmetric, Layered, Anti-Resonant, Bragg) waveguide, the topmost layer is often air and has a refractive index \_\_\_\_\_\_\_\_ the other two layers.

(A) Lower than

(B) Higher than

(C) Equal to the sum of

(D) Equal to the difference of

25. Devices operating at transmission rates greater than 40 Gb/s are typically made of \_\_\_\_\_\_\_\_.

(A) GaAs and InP

(B) GaAs

(C) InGaAs

(D) InGaAsP