TNPSC CTSE 2025

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UNIT IX: FIBER OPTIC COMMUNICATION, DIGITAL PANEL METER, SOLAR SYSTEM

QUESTION

Q01. Which material is commonly used for the core of an optical fiber?

A) Glass (Silica)

B) Copper

C) Aluminum

D) Plastic only

Q02. In optical fiber, which layer surrounds the core to prevent light leakage?

A) Cladding

B) Jacket

C) Buffer

D) Conduit

Q03. Single-mode optical fibers are primarily used for:

A) Long-distance communication

B) Short-distance LAN

C) Lighting only

D) Electrical power transmission

Q04. Multimode optical fibers are ideal for:

A) Short-distance communication

B) Long-distance telecommunication

C) Power transmission

D) Solar tracking

Q05. Which optical loss is caused by impurities in the fiber?

A) Absorption loss

B) Scattering loss

C) Bending loss

D) Connector loss

Q06. Loss caused by sharp bends in fiber is called:

A) Bending loss

B) Absorption loss

C) Dispersion loss

D) Connector loss

Q07. An optical fiber connector's main function is:

A) Aligning fiber cores

B) Amplifying light

C) Encoding signal

D) Converting voltage

Q08. Which device amplifies optical signals directly without electrical conversion?

A) Optical amplifier

B) LED

C) Laser diode

D) Photodiode

Q09. The primary advantage of optical fiber communication over copper cable is:

A) Higher bandwidth and lower loss

B) Higher cost

C) Shorter distance only

D) Susceptibility to EMI

Q10. Fiber optic cables are classified based on:

A) Core diameter and mode of propagation

B) Color of jacket

C) Material only

D) Connector type only

Q11. Seven-segment displays are commonly used to:

A) Display numerical digits

B) Display color images

C) Measure pressure

D) Convert voltage

Q12. A BCD-to-seven-segment decoder IC converts:

A) Binary-coded decimal to segment control

B) Analog to digital

C) Voltage to current

D) Fiber signals to light

Q13. Common driver IC used with seven-segment display is:

A) 7447

B) 555

C) 741 op-amp

D) 7805

Q14. The principle of LCD operation is:

A) Modulation of light by liquid crystals

B) Emission of light directly

C) Heat conduction

D) Sound conversion

Q15. A digital panel meter (DPM) with LCD displays:

A) Voltage, current, or resistance digitally

B) Fiber optic signal

C) Analog waveform only

D) Solar irradiance only

Q16. The advantage of using DPM over analog meter is:

A) Higher accuracy and easy reading

B) Lower cost only

C) Uses no power

D) Works without sensors

Q17. In solar power systems, the primary function of a solar inverter is:

A) Convert DC to AC

B) Store energy

C) Measure light intensity

D) Transmit signals

Q18. Maximum Power Point Tracking (MPPT) in solar systems:

A) Optimizes power extraction from solar panels

B) Reduces temperature

C) Measures voltage only

D) Measures light intensity

Q19. Solar charge controller protects batteries by:

A) Preventing overcharge and deep discharge

B) Measuring voltage only

C) Amplifying light signals

D) Controlling seven-segment display

Q20. Optical fiber encoding of light refers to:

A) Converting electrical signal to modulated light

B) Converting AC to DC

C) Converting digital to analog voltage

D) Measuring current

Q21. Multimode fiber has typical core diameter of:

A) 50–62.5 µm

B) 9 µm

C) 125 µm

D) 200 µm

Q22. Single-mode fiber has lower attenuation because:

A) Only one light mode propagates

B) Multiple modes propagate

C) Core is thicker

D) Cladding is absent

Q23. Typical optical fiber losses include:

A) Absorption, scattering, bending, connector losses

B) Only voltage loss

C) Only thermal loss

D) Only current loss

Q24. In seven-segment display, segment labeling is usually:

A) a–g

B) 1–7

C) A–G

D) 0–6

Q25. Liquid Crystal Display (LCD) brightness depends on:

A) Backlight intensity and applied voltage

B) Current only

C) Fiber optic connection

D) Temperature only

Q26. A fiber optic amplifier reduces:

A) Signal attenuation

B) Voltage

C) Current

D) Solar irradiance

Q27. Digital Panel Meters measure:

A) Voltage, current, resistance digitally

B) Only light

C) Only temperature

D) Only solar energy

Q28. Solar inverter converts power from:

A) DC from solar panel to AC for grid or appliances

B) AC to DC

C) Light to voltage

D) Fiber signal to AC

Q29. Fiber optic transmission uses light sources such as:

A) LED or Laser diode

B) Thermocouple

C) RTD

D) LVDT

Q30. Optical fiber connectors types include:

A) ST, SC, LC, FC

B) RJ45 only

C) USB only

D) HDMI only

Q31. Seven-segment display can show:

A) Digits 0–9

B) Alphabets only

C) Images only

D) Voltage directly

Q32. Optical fiber numerical aperture determines:

A) Light acceptance angle

B) Core diameter

C) Jacket thickness

D) LED color

Q33. LCD uses which type of light modulation?

A) Polarization rotation by liquid crystals

B) Emission of light

C) Scattering only

D) Absorption only

Q34. DPM accuracy depends on:

A) ADC resolution and input signal conditioning

B) Color of LCD

C) Fiber optic loss

D) Solar irradiance

Q35. Solar inverter efficiency can be improved by:

A) MPPT and low-loss design

B) Increasing voltage only

C) Fiber optic connection

D) RTD placement

Q36. Optical fiber attenuation is expressed in:

A) dB/km

B) Ohm

C) Volt

D) Ampere

Q37. Seven-segment display driver IC simplifies:

A) Connection between BCD signals and segments

B) Fiber optic connection

C) Solar tracking

D) Voltage measurement

Q38. Types of optical fiber include:

A) Single-mode, multimode step-index, multimode graded-index

B) Coaxial only

C) Twisted pair only

D) Ribbon only

Q39. DPM can be interfaced with LCD to display:

A) Voltage, current, resistance readings

B) Fiber light intensity

C) Solar irradiance only

D) Temperature only

Q40. Optical fiber advantages include:

A) High bandwidth, immunity to EMI, low loss

B) High weight

C) Low cost only

D) Susceptible to interference

Q41. Fiber optic light encoding involves:

A) Modulating LED or laser light with data signal

B) Converting AC to DC

C) Measuring voltage

D) Measuring current

Q42. Solar panels generate electricity via:

A) Photovoltaic effect

B) Induction

C) Thermal conduction

D) Fiber light

Q43. Seven-segment displays are commonly:

A) Common cathode or common anode

B) Always common anode only

C) Always common cathode only

D) Floating

Q44. Optical fiber testing includes:

A) OTDR, insertion loss measurement, visual inspection

B) RTD measurement

C) Thermocouple only

D) Voltage measurement only

Q45. LCD contrast depends on:

A) Applied voltage

B) Core diameter

C) Fiber type

D) Solar irradiance

Q46. Fiber optic connector loss is usually:

A) < 0.5 dB

B) > 10 dB

C) 5–10 V

D) 100 Ω

Q47. Solar inverter protection includes:

A) Overvoltage, overcurrent, and thermal protection

B) Fiber alignment

C) LCD contrast adjustment

D) Seven-segment display drive

Q48. Multimode step-index fiber has:

A) Uniform core refractive index

B) Graded index

C) Single-mode only

D) No cladding

Q49. LCD backlight is necessary for:

A) Visibility in low ambient light

B) Signal transmission

C) Voltage measurement

D) Fiber alignment

Q50. Solar charge controllers prevent:

A) Battery overcharge and deep discharge

B) Fiber loss

C) Seven-segment display error

D) LCD contrast drop

Q51. Optical time-domain reflectometer (OTDR) is used for:

A) Measuring fiber length and fault locations

B) Converting DC to AC

C) Seven-segment display driving

D) Measuring solar irradiance

Q52. Typical fiber optic cable specifications include:

A) Core/cladding diameter, NA, attenuation, wavelength

B) Voltage and current only

C) Fiber color

D) LCD size

Q53. Optical fiber coupling efficiency depends on:

A) Core alignment and mode matching

B) Applied voltage only

C) Fiber jacket color

D) LCD contrast

Q54. An optical amplifier type that uses erbium-doped fiber is:

A) EDFA

B) LED

C) PIN diode

D) LVDT

Q55. Seven-segment display common anode configuration requires:

A) Logic "0" to turn ON segments

B) Logic "1" to turn ON segments

C) Voltage only

D) Current only

Q56. LCD multiplexing reduces:

A) Number of control lines

B) Signal amplitude

C) Fiber loss

D) Solar irradiance

Q57. In fiber optics, modal dispersion affects:

A) Signal bandwidth over distance

B) Solar energy output

C) Voltage measurement

D) LCD contrast

Q58. Digital Panel Meter ADC converts:

A) Analog voltage or current to digital reading

B) Light to voltage

C) Fiber signal to AC

D) Solar energy to voltage

Q59. Solar inverters may include which topology?

A) String, central, microinverter

B) LVDT

C) RTD

D) LED

Q60. Fiber optic signal attenuation is minimized by:

A) Using low-loss fibers and proper connectors

B) Increasing voltage

C) Increasing current

D) Using thicker LCD backlight

Q61. Optical fiber dispersion can be reduced by:

A) Using single-mode fiber or dispersion-shifted fiber

B) Seven-segment display

C) Solar inverter

D) DPM

Q62. LED vs laser diode for fiber optics:

A) LED has broader spectrum, lower cost; Laser has narrow spectrum, higher distance

B) LED converts DC to AC

C) Laser measures solar irradiance

D) LED powers DPM

Q63. Optical fiber connectors ST, SC, LC differ in:

A) Connector design, insertion loss, application

B) Voltage rating only

C) Solar efficiency

D) LCD size

Q64. Fiber optic numerical aperture (NA) determines:

A) Acceptance angle of light

B) LCD brightness

C) DPM resolution

D) Solar panel tilt

Q65. Optical fiber cladding ensures:

A) Total internal reflection

B) Solar power conversion

C) Seven-segment display driving

D) DPM digit conversion

Q66. Fiber optic transmission loss due to Rayleigh scattering occurs because:

A) Microscopic density variations in glass

B) Temperature

C) Voltage

D) Solar irradiance

Q67. EDFA amplifies light without:

A) Electrical conversion

B) Voltage change

C) Solar energy conversion

D) LCD contrast adjustment

Q68. LCD segment switching is achieved by:

A) Applying voltage to specific electrodes

B) Changing fiber core

C) Adjusting solar irradiance

D) Seven-segment IC only

Q69. Solar inverter MPPT maximizes:

A) PV panel power output

B) Fiber light intensity

C) LCD brightness

D) Seven-segment contrast

Q70. Fiber optic splice types include:

A) Fusion and mechanical

B) ST and SC only

C) LCD and DPM

D) Solar and battery

Q71. Fiber optic connector insertion loss typically:

A) < 0.5 dB

B) > 10 dB

C) 5–10 V

D) 100 Ω

Q72. Seven-segment display driver IC 7447 is:

A) BCD to seven-segment decoder

B) ADC

C) DPM

D) Fiber amplifier

Q73. LCD contrast can be adjusted by:

A) Varying applied voltage

B) Fiber alignment

C) Solar tilt

D) Seven-segment brightness

Q74. Solar panel efficiency depends on:

A) Cell material, temperature, irradiation

B) Fiber core only

C) LCD contrast

D) DPM resolution

Q75. Digital Panel Meter measures RMS value using:

A) Microcontroller or ADC algorithms

B) Fiber light intensity

C) Solar voltage only

D) LCD segments

Q76. Fiber optic signal reflection occurs at:

A) Connector, splice, or defect points

B) LCD only

C) Solar panel only

D) DPM only

Q77. Solar inverter protection includes:

A) Overvoltage, overcurrent, short-circuit protection

B) Fiber alignment only

C) LCD contrast only

D) Seven-segment display only

Q78. Fiber optic encoding schemes include:

A) NRZ, Manchester, Pulse code modulation

B) Analog voltage

C) LCD contrast

D) Solar MPPT

Q79. DPM input can be:

A) AC, DC voltage or current

B) Fiber light only

C) Solar irradiance only

D) LCD segments

Q80. Single-mode fiber is preferred for:

A) Long-distance, high-speed networks

B) Short-distance LAN only

C) LCD only

D) DPM only

Q81. Multimode fiber step-index causes:

A) Higher modal dispersion

B) Solar power generation

C) LCD contrast change

D) DPM resolution

Q82. Fusion splice is stronger than mechanical splice because:

A) Fibers are permanently joined

B) Fibers are loosely held

C) Voltage applied

D) Fiber diameter increased

Q83. Fiber optic jacket protects against:

A) Mechanical damage, moisture, environmental stress

B) Voltage only

C) Solar tilt

D) LCD brightness

Q84. EDFA works best at wavelength:

A) 1550 nm

B) 850 nm

C) 1310 nm

D) 650 nm

Q85. LCD display in DPM improves:

A) Readability and accuracy

B) Fiber alignment

C) Solar MPPT

D) Seven-segment display

Q86. Fiber optic attenuation due to bending is:

A) Macrobending or microbending loss

B) Voltage drop only

C) Temperature rise

D) Solar irradiance change

Q87. Digital Panel Meter resolution depends on:

A) ADC bit depth

B) Fiber core diameter

C) Solar tilt

D) LCD backlight

Q88. Solar inverter output is:

A) AC voltage compatible with appliances or grid

B) DC only

C) Fiber light

D) LCD contrast

Q89. Seven-segment display decimal point is:

A) Separate segment controlled independently

B) Always ON

C) Always OFF

D) Voltage sensor

Q90. Fiber optic installation requires:

A) Clean connectors, proper bend radius, precise alignment

B) Solar tilt adjustment

C) LCD brightness calibration

D) Seven-segment IC only

Q91. DPM display can be updated using:

A) Microcontroller or ADC sampling

B) Fiber light intensity

C) Solar panel only

D) LCD contrast only

Q92. Optical fiber core and cladding refractive index difference ensures:

A) Total internal reflection

B) Solar tracking

C) LCD contrast

D) Seven-segment display

Q93. Solar system battery protection is done by:

A) Charge controller with overcharge and deep-discharge cut-off

B) Fiber optic cable

C) LCD voltage

D) Seven-segment IC

Q94. Fiber optic cable loss due to connector misalignment is:

A) Insertion loss

B) Bending loss

C) Dispersion

D) Solar efficiency loss

Q95. DPM can measure AC by:

A) RMS calculation using ADC and microcontroller

B) Fiber light

C) LCD only

D) Solar irradiance only

Q96. Seven-segment display driver IC simplifies:

A) Electrical connection and logic decoding for digits

B) Fiber alignment

C) Solar tilt

D) LCD contrast

Q97. Fiber optic cables are immune to:

A) Electromagnetic interference

B) Voltage drop

C) LCD contrast

D) Solar irradiance

Q98. Single-mode fiber core diameter is approximately:

A) 8–10 µm

B) 50 µm

C) 62.5 µm

D) 125 µm

Q99. LCD contrast is optimized by:

A) Adjusting voltage across segments

B) Fiber diameter

C) Solar panel angle

D) Seven-segment IC

Q100. Optical fiber testing ensures:

A) Low loss, proper installation, fault detection

B) Solar efficiency

C) LCD brightness

D) DPM accuracy

Q101. Which type of optical fiber is least affected by chromatic dispersion?

A) Single-mode fiber

B) Multimode step-index fiber

C) Plastic fiber

D) Multimode graded-index fiber

Q102. The main purpose of a fiber optic amplifier in a long-haul link is:

A) Boosting the optical signal without electrical conversion

B) Measuring voltage

C) Driving LCD displays

D) Tracking solar panel output

Q103. Fiber optic connector type LC is:

A) Small form-factor with latch

B) Coaxial

C) USB

D) HDMI

Q104. Optical fiber losses are typically measured in:

A) dB/km

B) Ohms

C) Volts

D) Watts

Q105. Seven-segment display driver IC 4511 is:

A) BCD to seven-segment latch/decoder/driver

B) ADC

C) Fiber amplifier

D) Solar MPPT controller

Q106. LCD operation is based on:

A) Polarization of light by liquid crystals under electric field

B) Emission of light

C) Solar PV conversion

D) Fiber light reflection

Q107. Solar inverter topology with each panel having its own inverter is:

A) Microinverter

B) String inverter

C) Central inverter

D) Step-up inverter

Q108. Digital Panel Meter accuracy depends on:

A) ADC resolution and input conditioning

B) Fiber type

C) Solar tilt

D) LCD backlight only

Q109. In optical fiber, bending loss increases when:

A) Radius of curvature decreases

B) Core diameter increases

C) Voltage increases

D) Solar irradiance changes

Q110. Multimode graded-index fiber reduces:

A) Modal dispersion

B) Fiber core diameter

C) Solar panel efficiency

D) LCD contrast

Q111. In seven-segment display, segment "a" corresponds to:

A) Top horizontal segment

B) Bottom segment

C) Decimal point

D) Middle horizontal segment

Q112. Optical fiber numerical aperture (NA) affects:

A) Light acceptance angle

B) ADC resolution

C) Solar panel output

D) LCD backlight

Q113. DPM interfaced with LCD allows:

A) Digital display of voltage, current, or resistance

B) Fiber alignment

C) Solar panel tracking

D) Seven-segment brightness

Q114. EDFA typically amplifies light in which band?

A) 1530–1565 nm

B) 850 nm

C) 1310 nm

D) 650 nm

Q115. Optical fiber splicing methods include:

A) Fusion and mechanical

B) Connector only

C) Seven-segment IC

D) Solar inverter

Q116. LCD contrast can be improved by:

A) Adjusting applied voltage

B) Increasing fiber diameter

C) Changing solar panel tilt

D) Changing seven-segment IC

Q117. Solar inverter MPPT algorithm adjusts:

A) Operating point to maximize PV output

B) Fiber numerical aperture

C) LCD brightness

D) DPM resolution

Q118. Fiber optic connector insertion loss can be minimized by:

A) Proper alignment and clean connectors

B) Increasing LCD backlight

C) Solar panel tracking

D) DPM calibration

Q119. Digital Panel Meter measures AC by:

A) Sampling waveform and calculating RMS digitally

B) Measuring solar irradiance

C) LCD contrast only

D) Seven-segment driving

Q120. Fiber optic backreflection can degrade signal due to:

A) Mismatched connectors or defects

B) Solar panel efficiency

C) LCD voltage

D) DPM resolution

Q121. Seven-segment display decimal point is controlled:

A) Independently

B) Always ON

C) Always OFF

D) By fiber optic signal

Q122. Optical fiber modal dispersion limits:

A) Bandwidth over distance

B) Solar panel output

C) LCD contrast

D) DPM resolution

Q123. Fiber optic light sources include:

A) LED and Laser diode

B) RTD

C) LVDT

D) Solar panel

Q124. LCD display in DPM eliminates:

A) Parallax errors and improves readability

B) Fiber optic loss

C) Solar tilt error

D) Seven-segment brightness issues

Q125. Solar inverter output waveform is usually:

A) Pure or modified sine wave AC

B) DC only

C) Fiber light

D) LCD signal

Q126. Fiber optic attenuation due to absorption is caused by:

A) Impurities in glass

B) Sharp bends

C) Connector misalignment

D) Seven-segment IC

Q127. Multimode step-index fiber has:

A) Abrupt core-cladding boundary

B) Graded index

C) Single-mode core

D) No cladding

Q128. Seven-segment display common cathode requires:

A) Logic "1" to turn ON segments

B) Logic "0"

C) Fiber alignment

D) LCD voltage

Q129. Fiber optic core material is usually:

A) Silica glass

B) Copper

C) Aluminum

D) Plastic only

Q130. LCD segments are turned ON by:

A) Applying voltage to specific electrodes

B) Fiber optic signal

C) Solar irradiance

D) DPM ADC

Q131. Optical fiber attenuation due to Rayleigh scattering is inversely proportional to:

A) Wavelength^4

B) Voltage

C) Current

D) LCD contrast

Q132. Optical fiber core-cladding interface ensures:

A) Total internal reflection

B) Solar power conversion

C) LCD brightness

D) DPM resolution

Q133. Fiber optic splice loss is minimized by:

A) Proper alignment and clean surfaces

B) Solar panel tilt

C) LCD voltage

D) Seven-segment IC

Q134. EDFA requires which pump wavelength?

A) 980 nm or 1480 nm

B) 850 nm

C) 1310 nm

D) 650 nm

Q135. Solar inverter overcurrent protection prevents:

A) Damage to inverter and loads

B) Fiber loss

C) LCD contrast drop

D) DPM error

Q136. Fiber optic connector types are chosen based on:

A) Application, density, insertion loss

B) LCD size

C) Solar panel tilt

D) DPM ADC resolution

Q137. DPM input scaling is done using:

A) Precision resistors or shunt for current measurement

B) Fiber optic signal

C) Solar irradiance

D) LCD backlight

Q138. Fiber optic splice protection is done by:

A) Heat shrink or mechanical housing

B) Solar MPPT

C) LCD contrast adjustment

D) Seven-segment IC

Q139. Seven-segment display brightness can be adjusted by:

A) Current-limiting resistors

B) Fiber alignment

C) Solar panel tilt

D) LCD voltage

Q140. Optical fiber connector types SC, ST differ in:

A) Coupling mechanism (push-pull vs bayonet)

B) Voltage rating

C) Solar efficiency

D) LCD size

Q141. Fiber optic cable jacket is typically made of:

A) PVC, LSZH, or polyurethane

B) Copper

C) Glass only

D) Silicon solar cell

Q142. Solar inverter efficiency is improved by:

A) Reducing switching losses and using MPPT

B) Fiber alignment

C) LCD contrast

D) Seven-segment brightness

Q143. Fiber optic testing for continuity uses:

A) Visual fault locator (VFL) or OTDR

B) LCD contrast

C) DPM resolution

D) Solar panel

Q144. Optical fiber core size affects:

A) Mode propagation and bandwidth

B) Solar panel efficiency

C) LCD contrast

D) DPM ADC resolution

Q145. Digital Panel Meter interfacing to LCD requires:

A) Proper voltage levels and segment mapping

B) Fiber optic signal

C) Solar irradiance measurement

D) MPPT only

Q146. Optical fiber step-index multimode causes:

A) Higher pulse spreading

B) Reduced solar output

C) LCD contrast change

D) DPM error

Q147. Seven-segment display common anode is activated by:

A) Low logic (0) at segment pin

B) High logic (1)

C) Fiber signal

D) Solar panel

Q148. EDFA gain is controlled by:

A) Pump laser power

B) Fiber diameter

C) Solar irradiance

D) LCD backlight

Q149. Fiber optic loss due to microbending is caused by:

A) Tiny bends along the fiber length

B) Connector type only

C) Solar tilt

D) LCD voltage

Q150. Solar inverter anti-islanding ensures:

A) No power injection during grid failure

B) Fiber signal stability

C) LCD contrast adjustment

D) DPM measurement accuracy

Q151. Optical fiber dispersion can be minimized using:

A) Single-mode fiber or dispersion-shifted fiber

B) Multimode step-index fiber

C) Solar inverter

D) LCD display

Q152. The main advantage of LED over laser in fiber optics is:

A) Lower cost and easier alignment

B) Higher distance capability

C) Narrow spectrum

D) Amplification

Q153. Fusion splice requires which equipment?

A) Fiber fusion splicer

B) OTDR

C) Seven-segment IC

D) Solar MPPT

Q154. Fiber optic connector polishing affects:

A) Insertion loss and return loss

B) Solar output

C) LCD contrast

D) DPM accuracy

Q155. Optical fiber chromatic dispersion occurs due to:

A) Different wavelengths traveling at different speeds

B) Connector type

C) Solar panel tilt

D) LCD brightness

Q156. Seven-segment display driver IC 7446 is used for:

A) Driving common-anode displays

B) Fiber alignment

C) Solar inverter

D) LCD contrast control

Q157. LCD display viewing angle can be improved by:

A) Using IPS or TFT technology

B) Adjusting fiber core

C) Solar panel tilt

D) DPM ADC

Q158. Solar inverter output synchronization ensures:

A) Safe connection to grid

B) Fiber optic coupling

C) LCD backlight control

D) Seven-segment brightness

Q159. Digital Panel Meter update rate is limited by:

A) ADC conversion speed and microcontroller processing

B) Fiber loss

C) Solar irradiance

D) LCD contrast

Q160. Optical fiber numerical aperture affects:

A) Light acceptance and coupling efficiency

B) Solar power

C) LCD voltage

D) Seven-segment IC

Q161. In EDFA, signal gain depends on:

A) Pump power and fiber length

B) Solar irradiance

C) LCD contrast

D) Seven-segment brightness

Q162. Fiber optic installation should maintain:

A) Minimum bend radius

B) Maximum voltage

C) LCD brightness

D) DPM resolution

Q163. Multiplexing in fiber optic communication allows:

A) Multiple signals over single fiber

B) LCD control

C) DPM measurement

D) Solar MPPT

Q164. Digital Panel Meter uses which component for analog-to-digital conversion?

A) ADC

B) LED

C) LCD segment

D) Fiber amplifier

Q165. Optical fiber connector SC features:

A) Push-pull coupling mechanism

B) Bayonet coupling

C) Screw connector

D) Solar inverter

Q166. Fiber optic dispersion-shifted fiber is designed to:

A) Reduce chromatic dispersion at 1550 nm

B) Increase solar efficiency

C) Enhance LCD contrast

D) Improve DPM resolution

Q167. LCD in DPM enhances:

A) Digital readability and precision

B) Fiber coupling

C) Solar tracking

D) Seven-segment display

Q168. Fiber optic attenuation due to bending is called:

A) Macrobending or microbending loss

B) Chromatic loss

C) Modal loss only

D) Solar tilt loss

Q169. Solar inverter efficiency improves with:

A) Reduced switching losses and MPPT

B) Fiber core alignment

C) LCD voltage

D) Seven-segment IC

Q170. Optical fiber testing ensures:

A) Low loss, proper installation, fault detection

B) Solar irradiance

C) LCD contrast

D) DPM update rate

Q171. Optical fiber connector LC is preferred for:

A) High-density installations

B) Solar panel

C) LCD only

D) Seven-segment IC

Q172. Fiber optic insertion loss is caused by:

A) Connector, splice, misalignment

B) LCD brightness

C) Solar tilt

D) DPM ADC resolution

Q173. Optical fiber backreflection can be minimized by:

A) Angled physical contact (APC) connectors

B) Solar tilt

C) LCD contrast

D) DPM ADC

Q174. EDFA pump laser wavelengths include:

A) 980 nm and 1480 nm

B) 850 nm only

C) 1310 nm only

D) 650 nm only

Q175. DPM resolution improves with:

A) Higher ADC bit depth

B) Fiber core diameter

C) Solar tilt

D) LCD contrast

Q176. Seven-segment display driver IC simplifies:

A) Wiring and BCD-to-segment decoding

B) Fiber alignment

C) Solar tracking

D) LCD brightness

Q177. Fiber optic cable outer jacket prevents:

A) Mechanical damage and environmental stress

B) Voltage drop

C) LCD contrast changes

D) DPM inaccuracy

Q178. Solar inverter anti-islanding protects:

A) Maintenance personnel and grid equipment

B) Fiber link

C) LCD display

D) DPM measurement

Q179. Optical fiber modal dispersion is minimized by:

A) Single-mode fiber

B) Multimode step-index fiber

C) Solar panel

D) LCD contrast

Q180. Digital Panel Meter uses sample-and-hold to:

A) Stabilize input signal for ADC

B) Fiber coupling

C) Solar MPPT

D) LCD brightness

Q181. Fiber optic launch condition affects:

A) Mode excitation and loss

B) Solar PV output

C) LCD contrast

D) DPM update rate

Q182. Optical fiber connector polishing affects:

A) Return loss and insertion loss

B) Solar irradiance

C) LCD brightness

D) Seven-segment IC

Q183. Solar inverter synchronization is critical for:

A) Grid-tied operation

B) Fiber coupling

C) LCD contrast

D) DPM ADC

Q184. Fiber optic OTDR measures:

A) Distance to fault, splice loss, overall attenuation

B) Solar efficiency

C) LCD brightness

D) DPM resolution

Q185. LCD response time is affected by:

A) Liquid crystal type and driving voltage

B) Fiber core

C) Solar panel tilt

D) DPM ADC

Q186. Digital Panel Meter input scaling is required to:

A) Match ADC range with measured signal

B) Fiber coupling

C) Solar MPPT

D) LCD contrast

Q187. Optical fiber splice loss is typically:

A) 0.1–0.3 dB for fusion, 0.3–0.5 dB for mechanical

B) 5–10 dB

C) 10–20 V

D) 100 Ω

Q188. Fiber optic connector APC is designed to:

A) Reduce backreflection

B) Increase solar output

C) Improve LCD contrast

D) DPM resolution

Q189. Solar inverter output waveform type is:

A) Pure or modified sine wave

B) DC only

C) Fiber light

D) LCD voltage

Q190. Fiber optic cable bend radius must be:

A) Above minimum specified to prevent macrobending loss

B) Below minimum

C) Irrelevant

D) Solar panel dependent

Q191. Seven-segment display decimal point allows:

A) Fractional numerical display

B) Fiber alignment

C) Solar tracking

D) LCD contrast

Q192. EDFA gain can be saturated if:

A) Input signal power is too high

B) Fiber core diameter changes

C) Solar irradiance increases

D) LCD contrast rises

Q193. Digital Panel Meter accuracy can be improved by:

A) Using high-resolution ADC and stable reference

B) Fiber alignment

C) Solar tilt

D) LCD brightness

Q194. Fiber optic modal noise occurs due to:

A) Interference between modes in multimode fibers

B) LCD contrast

C) Solar PV efficiency

D) DPM ADC resolution

Q195. Solar inverter efficiency is affected by:

A) MPPT accuracy and conversion losses

B) Fiber core diameter

C) LCD voltage

D) Seven-segment IC

Q196. Fiber optic cable color coding helps in:

A) Proper identification during installation

B) Solar PV output

C) LCD contrast

D) DPM ADC

Q197. Optical fiber attenuation due to scattering decreases with:

A) Increasing wavelength

B) Decreasing wavelength

C) Solar irradiance

D) LCD contrast

Q198. Digital Panel Meter overvoltage protection is done using:

A) Zener diodes or series resistors

B) Fiber alignment

C) Solar MPPT

D) LCD voltage

Q199. Fiber optic light source should match:

A) Fiber numerical aperture and core size

B) Solar panel efficiency

C) LCD voltage

D) DPM ADC

Q200. Solar inverter MPPT increases energy harvest by:

A) Operating PV panel at maximum power point

B) Aligning fiber cores

C) Adjusting LCD contrast

D) Seven-segment brightness

UNIT IX: FIBER OPTIC COMMUNICATION, DIGITAL PANEL METER, SOLAR SYSTEM

ANSWER AND EXPLANATION

Q01. Which material is commonly used for the core of an optical fiber?

A) Glass (Silica)

B) Copper

C) Aluminum

D) Plastic only

Answer: A

Explanation: High-purity silica glass allows low-loss light transmission in fiber optics.

Q02. In optical fiber, which layer surrounds the core to prevent light leakage?

A) Cladding

B) Jacket

C) Buffer

D) Conduit

Answer: A

Explanation: The cladding with lower refractive index keeps light confined by total internal reflection.

Q03. Single-mode optical fibers are primarily used for:

A) Long-distance communication

B) Short-distance LAN

C) Lighting only

D) Electrical power transmission

Answer: A

Explanation: Single-mode fibers have smaller cores, reducing modal dispersion for long-distance signals.

Q04. Multimode optical fibers are ideal for:

A) Short-distance communication

B) Long-distance telecommunication

C) Power transmission

D) Solar tracking

Answer: A

Explanation: Larger core allows multiple light modes, suitable for LANs and short-distance links.

Q05. Which optical loss is caused by impurities in the fiber?

A) Absorption loss

B) Scattering loss

C) Bending loss

D) Connector loss

Answer: A

Explanation: Impurities in glass absorb light energy, leading to attenuation.

Q06. Loss caused by sharp bends in fiber is called:

A) Bending loss

B) Absorption loss

C) Dispersion loss

D) Connector loss

Answer: A

Explanation: Light escapes the core at sharp bends, reducing transmission efficiency.

Q07. An optical fiber connector's main function is:

A) Aligning fiber cores

B) Amplifying light

C) Encoding signal

D) Converting voltage

Answer: A

Explanation: Proper alignment ensures minimal insertion loss between fiber sections.

Q08. Which device amplifies optical signals directly without electrical conversion?

A) Optical amplifier

B) LED

C) Laser diode

D) Photodiode

Answer: A

Explanation: Optical amplifiers boost light signal intensity, maintaining high-speed communication.

Q09. The primary advantage of optical fiber communication over copper cable is:

A) Higher bandwidth and lower loss

B) Higher cost

C) Shorter distance only

D) Susceptibility to EMI

Answer: A

Explanation: Optical fibers carry more data over longer distances with immunity to electromagnetic interference.

Q10. Fiber optic cables are classified based on:

A) Core diameter and mode of propagation

B) Color of jacket

C) Material only

D) Connector type only

Answer: A

Explanation: Single-mode and multimode fibers differ in core size and light propagation modes.

Q11. Seven-segment displays are commonly used to:

A) Display numerical digits

B) Display color images

C) Measure pressure

D) Convert voltage

Answer: A

Explanation: Seven LEDs arranged in segments can display digits 0–9.

Q12. A BCD-to-seven-segment decoder IC converts:

A) Binary-coded decimal to segment control

B) Analog to digital

C) Voltage to current

D) Fiber signals to light

Answer: A

Explanation: Decoder ICs simplify seven-segment display interfacing.

Q13. Common driver IC used with seven-segment display is:

A) 7447

B) 555

C) 741 op-amp

D) 7805

Answer: A

Explanation: 7447 BCD-to-seven-segment driver IC is widely used in digital displays.

Q14. The principle of LCD operation is:

A) Modulation of light by liquid crystals

B) Emission of light directly

C) Heat conduction

D) Sound conversion

Answer: A

Explanation: Liquid crystals rotate light polarization under electric field, controlling display.

Q15. A digital panel meter (DPM) with LCD displays:

A) Voltage, current, or resistance digitally

B) Fiber optic signal

C) Analog waveform only

D) Solar irradiance only

Answer: A

Explanation: DPMs provide accurate digital readings of electrical parameters.

Q16. The advantage of using DPM over analog meter is:

A) Higher accuracy and easy reading

B) Lower cost only

C) Uses no power

D) Works without sensors

Answer: A

Explanation: Digital display eliminates parallax error and enhances readability.

Q17. In solar power systems, the primary function of a solar inverter is:

A) Convert DC to AC

B) Store energy

C) Measure light intensity

D) Transmit signals

Answer: A

Explanation: Inverters convert solar DC output into AC suitable for appliances or grid.

Q18. Maximum Power Point Tracking (MPPT) in solar systems:

A) Optimizes power extraction from solar panels

B) Reduces temperature

C) Measures voltage only

D) Measures light intensity

Answer: A

Explanation: MPPT adjusts load to operate PV panel at maximum power point.

Q19. Solar charge controller protects batteries by:

A) Preventing overcharge and deep discharge

B) Measuring voltage only

C) Amplifying light signals

D) Controlling seven-segment display

Answer: A

Explanation: Ensures battery longevity in solar systems.

Q20. Optical fiber encoding of light refers to:

A) Converting electrical signal to modulated light

B) Converting AC to DC

C) Converting digital to analog voltage

D) Measuring current

Answer: A

Explanation: Electrical signals are converted to light pulses for optical transmission.

Q21. Multimode fiber has typical core diameter of:

A) 50–62.5 µm

B) 9 µm

C) 125 µm

D) 200 µm

Answer: A

Explanation: Larger core supports multiple propagation modes for short-distance communication.

Q22. Single-mode fiber has lower attenuation because:

A) Only one light mode propagates

B) Multiple modes propagate

C) Core is thicker

D) Cladding is absent

Answer: A

Explanation: Single mode reduces modal dispersion, minimizing loss.

Q23. Typical optical fiber losses include:

A) Absorption, scattering, bending, connector losses

B) Only voltage loss

C) Only thermal loss

D) Only current loss

Answer: A

Explanation: Various physical phenomena attenuate optical signals.

Q24. In seven-segment display, segment labeling is usually:

A) a–g

B) 1–7

C) A–G

D) 0–6

Answer: A

Explanation: Standard labeling allows consistent decoder IC connections.

Q25. Liquid Crystal Display (LCD) brightness depends on:

A) Backlight intensity and applied voltage

B) Current only

C) Fiber optic connection

D) Temperature only

Answer: A

Explanation: LCD requires backlight and electrical modulation for visibility.

Q26. A fiber optic amplifier reduces:

A) Signal attenuation

B) Voltage

C) Current

D) Solar irradiance

Answer: A

Explanation: Boosts optical signals directly without electrical conversion.

Q27. Digital Panel Meters measure:

A) Voltage, current, resistance digitally

B) Only light

C) Only temperature

D) Only solar energy

Answer: A

Explanation: DPMs provide accurate and direct reading of electrical parameters.

Q28. Solar inverter converts power from:

A) DC from solar panel to AC for grid or appliances

B) AC to DC

C) Light to voltage

D) Fiber signal to AC

Answer: A

Explanation: Converts photovoltaic DC output to usable AC.

Q29. Fiber optic transmission uses light sources such as:

A) LED or Laser diode

B) Thermocouple

C) RTD

D) LVDT

Answer: A

Explanation: LEDs and lasers generate modulated light for fiber communication.

Q30. Optical fiber connectors types include:

A) ST, SC, LC, FC

B) RJ45 only

C) USB only

D) HDMI only

Answer: A

Explanation: These connectors provide standardized fiber terminations.

Q31. Seven-segment display can show:

A) Digits 0–9

B) Alphabets only

C) Images only

D) Voltage directly

Answer: A

Explanation: Each segment combination forms numeric digits.

Q32. Optical fiber numerical aperture determines:

A) Light acceptance angle

B) Core diameter

C) Jacket thickness

D) LED color

Answer: A

Explanation: NA defines maximum incident angle for light to be guided.

Q33. LCD uses which type of light modulation?

A) Polarization rotation by liquid crystals

B) Emission of light

C) Scattering only

D) Absorption only

Answer: A

Explanation: Polarized light passes or blocks depending on electric field applied.

Q34. DPM accuracy depends on:

A) ADC resolution and input signal conditioning

B) Color of LCD

C) Fiber optic loss

D) Solar irradiance

Answer: A

Explanation: Proper ADC and input circuitry ensure precise readings.

Q35. Solar inverter efficiency can be improved by:

A) MPPT and low-loss design

B) Increasing voltage only

C) Fiber optic connection

D) RTD placement

Answer: A

Explanation: MPPT maximizes output and reduces inverter losses.

Q36. Optical fiber attenuation is expressed in:

A) dB/km

B) Ohm

C) Volt

D) Ampere

Answer: A

Explanation: Decibel per kilometer quantifies signal loss along fiber.

Q37. Seven-segment display driver IC simplifies:

A) Connection between BCD signals and segments

B) Fiber optic connection

C) Solar tracking

D) Voltage measurement

Answer: A

Explanation: IC handles logic conversion and segment activation.

Q38. Types of optical fiber include:

A) Single-mode, multimode step-index, multimode graded-index

B) Coaxial only

C) Twisted pair only

D) Ribbon only

Answer: A

Explanation: Fiber type affects propagation mode and application.

Q39. DPM can be interfaced with LCD to display:

A) Voltage, current, resistance readings

B) Fiber light intensity

C) Solar irradiance only

D) Temperature only

Answer: A

Explanation: LCD provides visual digital readout from DPM.

Q40. Optical fiber advantages include:

A) High bandwidth, immunity to EMI, low loss

B) High weight

C) Low cost only

D) Susceptible to interference

Answer: A

Explanation: Optical fibers transmit large data over long distances reliably.

Q41. Fiber optic light encoding involves:

A) Modulating LED or laser light with data signal

B) Converting AC to DC

C) Measuring voltage

D) Measuring current

Answer: A

Explanation: Electrical signals modulate light for optical transmission.

Q42. Solar panels generate electricity via:

A) Photovoltaic effect

B) Induction

C) Thermal conduction

D) Fiber light

Answer: A

Explanation: Light photons create electron-hole pairs in PV cells producing DC.

Q43. Seven-segment displays are commonly:

A) Common cathode or common anode

B) Always common anode only

C) Always common cathode only

D) Floating

Answer: A

Explanation: Determines electrical connection configuration for segment control.

Q44. Optical fiber testing includes:

A) OTDR, insertion loss measurement, visual inspection

B) RTD measurement

C) Thermocouple only

D) Voltage measurement only

Answer: A

Explanation: Ensures signal integrity and proper installation.

Q45. LCD contrast depends on:

A) Applied voltage

B) Core diameter

C) Fiber type

D) Solar irradiance

Answer: A

Explanation: Correct voltage controls rotation of liquid crystals, affecting visibility.

Q46. Fiber optic connector loss is usually:

A) < 0.5 dB

B) > 10 dB

C) 5–10 V

D) 100 Ω

Answer: A

Explanation: Good connectors minimize insertion loss to maintain signal strength.

Q47. Solar inverter protection includes:

A) Overvoltage, overcurrent, and thermal protection

B) Fiber alignment

C) LCD contrast adjustment

D) Seven-segment display drive

Answer: A

Explanation: Protects inverter and connected load from faults.

Q48. Multimode step-index fiber has:

A) Uniform core refractive index

B) Graded index

C) Single-mode only

D) No cladding

Answer: A

Explanation: Step-index fiber has abrupt core-cladding boundary with uniform index.

Q49. LCD backlight is necessary for:

A) Visibility in low ambient light

B) Signal transmission

C) Voltage measurement

D) Fiber alignment

Answer: A

Explanation: Backlight illuminates LCD for readable display.

Q50. Solar charge controllers prevent:

A) Battery overcharge and deep discharge

B) Fiber loss

C) Seven-segment display error

D) LCD contrast drop

Answer: A

Explanation: Maintains battery health in solar PV systems.

Q51. Optical time-domain reflectometer (OTDR) is used for:

A) Measuring fiber length and fault locations

B) Converting DC to AC

C) Seven-segment display driving

D) Measuring solar irradiance

Answer: A

Explanation: OTDR sends pulses through fiber to detect reflection points and losses.

Q52. Typical fiber optic cable specifications include:

A) Core/cladding diameter, NA, attenuation, wavelength

B) Voltage and current only

C) Fiber color

D) LCD size

Answer: A

Explanation: Core size, numerical aperture, and attenuation define fiber performance.

Q53. Optical fiber coupling efficiency depends on:

A) Core alignment and mode matching

B) Applied voltage only

C) Fiber jacket color

D) LCD contrast

Answer: A

Explanation: Precise alignment minimizes insertion loss between fibers.

Q54. An optical amplifier type that uses erbium-doped fiber is:

A) EDFA

B) LED

C) PIN diode

D) LVDT

Answer: A

Explanation: Erbium-doped fiber amplifies C-band wavelengths in long-haul optical communication.

Q55. Seven-segment display common anode configuration requires:

A) Logic "0" to turn ON segments

B) Logic "1" to turn ON segments

C) Voltage only

D) Current only

Answer: A

Explanation: Common anode connects all anodes to positive; segments light when cathode receives 0.

Q56. LCD multiplexing reduces:

A) Number of control lines

B) Signal amplitude

C) Fiber loss

D) Solar irradiance

Answer: A

Explanation: Multiplexing allows multiple segments controlled with fewer pins.

Q57. In fiber optics, modal dispersion affects:

A) Signal bandwidth over distance

B) Solar energy output

C) Voltage measurement

D) LCD contrast

Answer: A

Explanation: Multiple modes travel different paths causing pulse broadening.

Q58. Digital Panel Meter ADC converts:

A) Analog voltage or current to digital reading

B) Light to voltage

C) Fiber signal to AC

D) Solar energy to voltage

Answer: A

Explanation: ADC enables accurate numerical display in DPMs.

Q59. Solar inverters may include which topology?

A) String, central, microinverter

B) LVDT

C) RTD

D) LED

Answer: A

Explanation: Inverters are classified by how PV panels are connected and power is converted.

Q60. Fiber optic signal attenuation is minimized by:

A) Using low-loss fibers and proper connectors

B) Increasing voltage

C) Increasing current

D) Using thicker LCD backlight

Answer: A

Explanation: Material purity and connector quality reduce transmission loss.

Q61. Optical fiber dispersion can be reduced by:

A) Using single-mode fiber or dispersion-shifted fiber

B) Seven-segment display

C) Solar inverter

D) DPM

Answer: A

Explanation: Proper fiber selection minimizes pulse broadening in long-distance links.

Q62. LED vs laser diode for fiber optics:

A) LED has broader spectrum, lower cost; Laser has narrow spectrum, higher distance

B) LED converts DC to AC

C) Laser measures solar irradiance

D) LED powers DPM

Answer: A

Explanation: LEDs suit short-distance; lasers suit long-distance high-speed transmission.

Q63. Optical fiber connectors ST, SC, LC differ in:

A) Connector design, insertion loss, application

B) Voltage rating only

C) Solar efficiency

D) LCD size

Answer: A

Explanation: Each connector type suits different fiber network requirements.

Q64. Fiber optic numerical aperture (NA) determines:

A) Acceptance angle of light

B) LCD brightness

C) DPM resolution

D) Solar panel tilt

Answer: A

Explanation: NA defines the range of incident light angles that the core can accept.

Q65. Optical fiber cladding ensures:

A) Total internal reflection

B) Solar power conversion

C) Seven-segment display driving

D) DPM digit conversion

Answer: A

Explanation: Lower refractive index in cladding keeps light confined in the core.

Q66. Fiber optic transmission loss due to Rayleigh scattering occurs because:

A) Microscopic density variations in glass

B) Temperature

C) Voltage

D) Solar irradiance

Answer: A

Explanation: Scattering causes attenuation proportional to wavelength.

Q67. EDFA amplifies light without:

A) Electrical conversion

B) Voltage change

C) Solar energy conversion

D) LCD contrast adjustment

Answer: A

Explanation: Optical amplification occurs directly in the fiber doped with erbium ions.

Q68. LCD segment switching is achieved by:

A) Applying voltage to specific electrodes

B) Changing fiber core

C) Adjusting solar irradiance

D) Seven-segment IC only

Answer: A

Explanation: Electric field rotates liquid crystals to modulate light.

Q69. Solar inverter MPPT maximizes:

A) PV panel power output

B) Fiber light intensity

C) LCD brightness

D) Seven-segment contrast

Answer: A

Explanation: MPPT dynamically adjusts load for optimal power extraction.

Q70. Fiber optic splice types include:

A) Fusion and mechanical

B) ST and SC only

C) LCD and DPM

D) Solar and battery

Answer: A

Explanation: Fusion splicing melts fibers; mechanical aligns and holds fibers.

Q71. Fiber optic connector insertion loss typically:

A) < 0.5 dB

B) > 10 dB

C) 5–10 V

D) 100 Ω

Answer: A

Explanation: Low insertion loss ensures minimal signal degradation.

Q72. Seven-segment display driver IC 7447 is:

A) BCD to seven-segment decoder

B) ADC

C) DPM

D) Fiber amplifier

Answer: A

Explanation: Converts BCD input to segment outputs for numerical display.

Q73. LCD contrast can be adjusted by:

A) Varying applied voltage

B) Fiber alignment

C) Solar tilt

D) Seven-segment brightness

Answer: A

Explanation: Voltage controls the liquid crystal's light modulation efficiency.

Q74. Solar panel efficiency depends on:

A) Cell material, temperature, irradiation

B) Fiber core only

C) LCD contrast

D) DPM resolution

Answer: A

Explanation: Silicon quality, sunlight intensity, and heat affect output.

Q75. Digital Panel Meter measures RMS value using:

A) Microcontroller or ADC algorithms

B) Fiber light intensity

C) Solar voltage only

D) LCD segments

Answer: A

Explanation: ADC and firmware calculate RMS from sampled waveform.

Q76. Fiber optic signal reflection occurs at:

A) Connector, splice, or defect points

B) LCD only

C) Solar panel only

D) DPM only

Answer: A

Explanation: Mismatched refractive index causes back reflection.

Q77. Solar inverter protection includes:

A) Overvoltage, overcurrent, short-circuit protection

B) Fiber alignment only

C) LCD contrast only

D) Seven-segment display only

Answer: A

Explanation: Protects inverter and downstream devices from electrical faults.

Q78. Fiber optic encoding schemes include:

A) NRZ, Manchester, Pulse code modulation

B) Analog voltage

C) LCD contrast

D) Solar MPPT

Answer: A

Explanation: Converts electrical digital data into optical pulses for transmission.

Q79. DPM input can be:

A) AC, DC voltage or current

B) Fiber light only

C) Solar irradiance only

D) LCD segments

Answer: A

Explanation: DPM circuits measure a wide range of electrical parameters.

Q80. Single-mode fiber is preferred for:

A) Long-distance, high-speed networks

B) Short-distance LAN only

C) LCD only

D) DPM only

Answer: A

Explanation: Single-mode reduces modal dispersion for reliable long-distance communication.

Q81. Multimode fiber step-index causes:

A) Higher modal dispersion

B) Solar power generation

C) LCD contrast change

D) DPM resolution

Answer: A

Explanation: Multiple light paths lead to pulse spreading and bandwidth limitation.

Q82. Fusion splice is stronger than mechanical splice because:

A) Fibers are permanently joined

B) Fibers are loosely held

C) Voltage applied

D) Fiber diameter increased

Answer: A

Explanation: Fusion creates continuous glass core with minimal loss.

Q83. Fiber optic jacket protects against:

A) Mechanical damage, moisture, environmental stress

B) Voltage only

C) Solar tilt

D) LCD brightness

Answer: A

Explanation: Jackets provide mechanical robustness and environmental protection.

Q84. EDFA works best at wavelength:

A) 1550 nm

B) 850 nm

C) 1310 nm

D) 650 nm

Answer: A

Explanation: Erbium ions amplify C-band wavelength used in long-haul networks.

Q85. LCD display in DPM improves:

A) Readability and accuracy

B) Fiber alignment

C) Solar MPPT

D) Seven-segment display

Answer: A

Explanation: Digital readout eliminates analog errors and parallax issues.

Q86. Fiber optic attenuation due to bending is:

A) Macrobending or microbending loss

B) Voltage drop only

C) Temperature rise

D) Solar irradiance change

Answer: A

Explanation: Bends cause light to escape from core, reducing transmission efficiency.

Q87. Digital Panel Meter resolution depends on:

A) ADC bit depth

B) Fiber core diameter

C) Solar tilt

D) LCD backlight

Answer: A

Explanation: More ADC bits provide finer measurement granularity.

Q88. Solar inverter output is:

A) AC voltage compatible with appliances or grid

B) DC only

C) Fiber light

D) LCD contrast

Answer: A

Explanation: Converts DC from PV panels to usable AC.

Q89. Seven-segment display decimal point is:

A) Separate segment controlled independently

B) Always ON

C) Always OFF

D) Voltage sensor

Answer: A

Explanation: Decimal point allows fractional numerical display.

Q90. Fiber optic installation requires:

A) Clean connectors, proper bend radius, precise alignment

B) Solar tilt adjustment

C) LCD brightness calibration

D) Seven-segment IC only

Answer: A

Explanation: Proper installation ensures low loss and high signal quality

.

Q91. DPM display can be updated using:

A) Microcontroller or ADC sampling

B) Fiber light intensity

C) Solar panel only

D) LCD contrast only

Answer: A

Explanation: Sampling and processing provide accurate real-time display.

Q92. Optical fiber core and cladding refractive index difference ensures:

A) Total internal reflection

B) Solar tracking

C) LCD contrast

D) Seven-segment display

Answer: A

Explanation: Light stays confined within core by refractive index difference.

Q93. Solar system battery protection is done by:

A) Charge controller with overcharge and deep-discharge cut-off

B) Fiber optic cable

C) LCD voltage

D) Seven-segment IC

Answer: A

Explanation: Protects batteries and extends lifespan.

Q94. Fiber optic cable loss due to connector misalignment is:

A) Insertion loss

B) Bending loss

C) Dispersion

D) Solar efficiency loss

Answer: A

Explanation: Misaligned connectors prevent maximum light transmission.

Q95. DPM can measure AC by:

A) RMS calculation using ADC and microcontroller

B) Fiber light

C) LCD only

D) Solar irradiance only

Answer: A

Explanation: Digital circuits compute RMS values for AC signals.

Q96. Seven-segment display driver IC simplifies:

A) Electrical connection and logic decoding for digits

B) Fiber alignment

C) Solar tilt

D) LCD contrast

Answer: A

Explanation: Converts binary input to segment control signals.

Q97. Fiber optic cables are immune to:

A) Electromagnetic interference

B) Voltage drop

C) LCD contrast

D) Solar irradiance

Answer: A

Explanation: Light transmission in glass fibers is not affected by EMI.

Q98. Single-mode fiber core diameter is approximately:

A) 8–10 µm

B) 50 µm

C) 62.5 µm

D) 125 µm

Answer: A

Explanation: Small core ensures only one mode propagates.

Q99. LCD contrast is optimized by:

A) Adjusting voltage across segments

B) Fiber diameter

C) Solar panel angle

D) Seven-segment IC

Answer: A

Explanation: Voltage changes the light modulation of liquid crystals.

Q100. Optical fiber testing ensures:

A) Low loss, proper installation, fault detection

B) Solar efficiency

C) LCD brightness

D) DPM accuracy

Answer: A

Explanation: Testing confirms signal integrity and proper operation of fiber link.

Q101. Which type of optical fiber is least affected by chromatic dispersion?

A) Single-mode fiber

B) Multimode step-index fiber

C) Plastic fiber

D) Multimode graded-index fiber

Answer: A

Explanation: Single-mode fiber carries one light mode, minimizing dispersion.

Q102. The main purpose of a fiber optic amplifier in a long-haul link is:

A) Boosting the optical signal without electrical conversion

B) Measuring voltage

C) Driving LCD displays

D) Tracking solar panel output

Answer: A

Explanation: Amplifiers increase light intensity for long-distance transmission.

Q103. Fiber optic connector type LC is:

A) Small form-factor with latch

B) Coaxial

C) USB

D) HDMI

Answer: A

Explanation: LC connectors are compact and suitable for high-density installations.

Q104. Optical fiber losses are typically measured in:

A) dB/km

B) Ohms

C) Volts

D) Watts

Answer: A

Explanation: Decibels per kilometer quantify the signal attenuation.

Q105. Seven-segment display driver IC 4511 is:

A) BCD to seven-segment latch/decoder/driver

B) ADC

C) Fiber amplifier

D) Solar MPPT controller

Answer: A

Explanation: Converts BCD input to segment outputs and latches them for display.

Q106. LCD operation is based on:

A) Polarization of light by liquid crystals under electric field

B) Emission of light

C) Solar PV conversion

D) Fiber light reflection

Answer: A

Explanation: Electric field rotates crystals, modulating transmitted light.

Q107. Solar inverter topology with each panel having its own inverter is:

A) Microinverter

B) String inverter

C) Central inverter

D) Step-up inverter

Answer: A

Explanation: Microinverters optimize each panel individually for maximum output.

Q108. Digital Panel Meter accuracy depends on:

A) ADC resolution and input conditioning

B) Fiber type

C) Solar tilt

D) LCD backlight only

Answer: A

Explanation: Higher-resolution ADCs provide more precise measurements.

Q109. In optical fiber, bending loss increases when:

A) Radius of curvature decreases

B) Core diameter increases

C) Voltage increases

D) Solar irradiance changes

Answer: A

Explanation: Sharper bends cause light to escape from the core.

Q110. Multimode graded-index fiber reduces:

A) Modal dispersion

B) Fiber core diameter

C) Solar panel efficiency

D) LCD contrast

Answer: A

Explanation: Gradual refractive index change slows central rays, reducing pulse broadening.

Q111. In seven-segment display, segment "a" corresponds to:

A) Top horizontal segment

B) Bottom segment

C) Decimal point

D) Middle horizontal segment

Answer: A

Explanation: Standard segment labeling ensures consistent display logic.

Q112. Optical fiber numerical aperture (NA) affects:

A) Light acceptance angle

B) ADC resolution

C) Solar panel output

D) LCD backlight

Answer: A

Explanation: NA defines the maximum angle of incident light that will propagate in the core.

Q113. DPM interfaced with LCD allows:

A) Digital display of voltage, current, or resistance

B) Fiber alignment

C) Solar panel tracking

D) Seven-segment brightness

Answer: A

Explanation: ADC converts analog signals, and LCD provides readable output.

Q114. EDFA typically amplifies light in which band?

A) 1530–1565 nm

B) 850 nm

C) 1310 nm

D) 650 nm

Answer: A

Explanation: Erbium-doped fiber amplifies C-band signals in long-haul communication.

Q115. Optical fiber splicing methods include:

A) Fusion and mechanical

B) Connector only

C) Seven-segment IC

D) Solar inverter

Answer: A

Explanation: Fusion splicing permanently joins fibers; mechanical splicing aligns them temporarily.

Q116. LCD contrast can be improved by:

A) Adjusting applied voltage

B) Increasing fiber diameter

C) Changing solar panel tilt

D) Changing seven-segment IC

Answer: A

Explanation: Voltage control changes the alignment of liquid crystals to modulate light.

Q117. Solar inverter MPPT algorithm adjusts:

A) Operating point to maximize PV output

B) Fiber numerical aperture

C) LCD brightness

D) DPM resolution

Answer: A

Explanation: MPPT ensures the PV panel produces maximum possible power under varying conditions.

Q118. Fiber optic connector insertion loss can be minimized by:

A) Proper alignment and clean connectors

B) Increasing LCD backlight

C) Solar panel tracking

D) DPM calibration

Answer: A

Explanation: Clean, well-aligned connectors reduce signal loss.

Q119. Digital Panel Meter measures AC by:

A) Sampling waveform and calculating RMS digitally

B) Measuring solar irradiance

C) LCD contrast only

D) Seven-segment driving

Answer: A

Explanation: Microcontroller computes RMS value from ADC samples.

Q120. Fiber optic backreflection can degrade signal due to:

A) Mismatched connectors or defects

B) Solar panel efficiency

C) LCD voltage

D) DPM resolution

Answer: A

Explanation: Reflected light interferes with incoming signals, reducing quality.

Q121. Seven-segment display decimal point is controlled:

A) Independently

B) Always ON

C) Always OFF

D) By fiber optic signal

Answer: A

Explanation: Allows fractional numerical representation.

Q122. Optical fiber modal dispersion limits:

A) Bandwidth over distance

B) Solar panel output

C) LCD contrast

D) DPM resolution

Answer: A

Explanation: Multiple light paths cause pulse broadening, limiting speed-distance product.

Q123. Fiber optic light sources include:

A) LED and Laser diode

B) RTD

C) LVDT

D) Solar panel

Answer: A

Explanation: Light-emitting devices convert electrical data into optical signals.

Q124. LCD display in DPM eliminates:

A) Parallax errors and improves readability

B) Fiber optic loss

C) Solar tilt error

D) Seven-segment brightness issues

Answer: A

Explanation: Digital readout avoids analog pointer limitations.

Q125. Solar inverter output waveform is usually:

A) Pure or modified sine wave AC

B) DC only

C) Fiber light

D) LCD signal

Answer: A

Explanation: Converts PV DC to AC compatible with appliances or grid.

Q126. Fiber optic attenuation due to absorption is caused by:

A) Impurities in glass

B) Sharp bends

C) Connector misalignment

D) Seven-segment IC

Answer: A

Explanation: Impurities absorb optical energy, reducing transmission.

Q127. Multimode step-index fiber has:

A) Abrupt core-cladding boundary

B) Graded index

C) Single-mode core

D) No cladding

Answer: A

Explanation: Light propagates in multiple modes with uniform core.

Q128. Seven-segment display common cathode requires:

A) Logic "1" to turn ON segments

B) Logic "0"

C) Fiber alignment

D) LCD voltage

Answer: A

Explanation: Cathode segments connect to ground; high signal activates them.

Q129. Fiber optic core material is usually:

A) Silica glass

B) Copper

C) Aluminum

D) Plastic only

Answer: A

Explanation: High-purity silica provides low-loss transmission.

Q130. LCD segments are turned ON by:

A) Applying voltage to specific electrodes

B) Fiber optic signal

C) Solar irradiance

D) DPM ADC

Answer: A

Explanation: Voltage causes crystals to rotate, modulating light transmission.

Q131. Optical fiber attenuation due to Rayleigh scattering is inversely proportional to:

A) Wavelength⁴

B) Voltage

C) Current

D) LCD contrast

Answer: A

Explanation: Shorter wavelengths scatter more, causing higher attenuation.

Q132. Optical fiber core-cladding interface ensures:

A) Total internal reflection

B) Solar power conversion

C) LCD brightness

D) DPM resolution

Answer: A

Explanation: Light is confined inside core by refractive index difference.

Q133. Fiber optic splice loss is minimized by:

A) Proper alignment and clean surfaces

B) Solar panel tilt

C) LCD voltage

D) Seven-segment IC

Answer: A

Explanation: Precise fusion or mechanical alignment reduces attenuation.

Q134. EDFA requires which pump wavelength?

A) 980 nm or 1480 nm

B) 850 nm

C) 1310 nm

D) 650 nm

Answer: A

Explanation: Pump lasers excite erbium ions to amplify C-band light.

Q135. Solar inverter overcurrent protection prevents:

A) Damage to inverter and loads

B) Fiber loss

C) LCD contrast drop

D) DPM error

Answer: A

Explanation: Detects excessive current and interrupts flow to protect components.

Q136. Fiber optic connector types are chosen based on:

A) Application, density, insertion loss

B) LCD size

C) Solar panel tilt

D) DPM ADC resolution

Answer: A

Explanation: Connector choice affects performance and installation.

Q137. DPM input scaling is done using:

A) Precision resistors or shunt for current measurement

B) Fiber optic signal

C) Solar irradiance

D) LCD backlight

Answer: A

Explanation: Resistors convert measured current/voltage into ADC-compatible levels.

Q138. Fiber optic splice protection is done by:

A) Heat shrink or mechanical housing

B) Solar MPPT

C) LCD contrast adjustment

D) Seven-segment IC

Answer: A

Explanation: Protects spliced fiber from mechanical damage.

Q139. Seven-segment display brightness can be adjusted by:

A) Current-limiting resistors

B) Fiber alignment

C) Solar panel tilt

D) LCD voltage

Answer: A

Explanation: Limiting current controls segment illumination intensity.

Q140. Optical fiber connector types SC, ST differ in:

A) Coupling mechanism (push-pull vs bayonet)

B) Voltage rating

C) Solar efficiency

D) LCD size

Answer: A

Explanation: Different designs suit various installation and performance requirements.

Q141. Fiber optic cable jacket is typically made of:

A) PVC, LSZH, or polyurethane

B) Copper

C) Glass only

D) Silicon solar cell

Answer: A

Explanation: Provides mechanical and environmental protection.

Q142. Solar inverter efficiency is improved by:

A) Reducing switching losses and using MPPT

B) Fiber alignment

C) LCD contrast

D) Seven-segment brightness

Answer: A

Explanation: Efficient topology and MPPT maximize power conversion.

Q143. Fiber optic testing for continuity uses:

A) Visual fault locator (VFL) or OTDR

B) LCD contrast

C) DPM resolution

D) Solar panel

Answer: A

Explanation: Red visible light or OTDR pulses detect breaks or faults.

Q144. Optical fiber core size affects:

A) Mode propagation and bandwidth

B) Solar panel efficiency

C) LCD contrast

D) DPM ADC resolution

Answer: A

Explanation: Smaller core allows single-mode; larger core supports multimode.

Q145. Digital Panel Meter interfacing to LCD requires:

A) Proper voltage levels and segment mapping

B) Fiber optic signal

C) Solar irradiance measurement

D) MPPT only

Answer: A

Explanation: Ensures accurate digital readout of electrical parameters.

Q146. Optical fiber step-index multimode causes:

A) Higher pulse spreading

B) Reduced solar output

C) LCD contrast change

D) DPM error

Answer: A

Explanation: Uniform core leads to different propagation times for modes.

Q147. Seven-segment display common anode is activated by:

A) Low logic (0) at segment pin

B) High logic (1)

C) Fiber signal

D) Solar panel

Answer: A

Explanation: All anodes connected to positive; segment turns on when cathode is low.

Q148. EDFA gain is controlled by:

A) Pump laser power

B) Fiber diameter

C) Solar irradiance

D) LCD backlight

Answer: A

Explanation: Higher pump power increases amplification.

Q149. Fiber optic loss due to microbending is caused by:

A) Tiny bends along the fiber length

B) Connector type only

C) Solar tilt

D) LCD voltage

Answer: A

Explanation: Microbends scatter light, increasing attenuation.

Q150. Solar inverter anti-islanding ensures:

A) No power injection during grid failure

B) Fiber signal stability

C) LCD contrast adjustment

D) DPM measurement accuracy

Answer: A

Explanation: Protects maintenance personnel and prevents equipment damage.

Q151. Optical fiber dispersion can be minimized using:

A) Single-mode fiber or dispersion-shifted fiber

B) Multimode step-index fiber

C) Solar inverter

D) LCD display

Answer: A

Explanation: Proper fiber selection reduces pulse broadening over long distances.

Q152. The main advantage of LED over laser in fiber optics is:

A) Lower cost and easier alignment

B) Higher distance capability

C) Narrow spectrum

D) Amplification

Answer: A

Explanation: LEDs are cheaper and easier to couple to multimode fibers.

Q153. Fusion splice requires which equipment?

A) Fiber fusion splicer

B) OTDR

C) Seven-segment IC

D) Solar MPPT

Answer: A

Explanation: Precisely aligns and fuses fibers for low-loss joint.

Q154. Fiber optic connector polishing affects:

A) Insertion loss and return loss

B) Solar output

C) LCD contrast

D) DPM accuracy

Answer: A

Explanation: Proper polish ensures smooth surface for minimal signal reflection.

Q155. Optical fiber chromatic dispersion occurs due to:

A) Different wavelengths traveling at different speeds

B) Connector type

C) Solar panel tilt

D) LCD brightness

Answer: A

Explanation: Different wavelengths propagate at slightly different velocities, causing pulse spreading.

Q156. Seven-segment display driver IC 7446 is used for:

A) Driving common-anode displays

B) Fiber alignment

C) Solar inverter

D) LCD contrast control

Answer: A

Explanation: Converts BCD input to segment signals for common-anode displays.

Q157. LCD display viewing angle can be improved by:

A) Using IPS or TFT technology

B) Adjusting fiber core

C) Solar panel tilt

D) DPM ADC

Answer: A

Explanation: In-plane switching or TFT improves contrast and visibility at wide angles

Q158. Solar inverter output synchronization ensures:

A) Safe connection to grid

B) Fiber optic coupling

C) LCD backlight control

D) Seven-segment brightness

Answer: A

Explanation: Inverters must match grid voltage, frequency, and phase before feeding power.

Q159. Digital Panel Meter update rate is limited by:

A) ADC conversion speed and microcontroller processing

B) Fiber loss

C) Solar irradiance

D) LCD contrast

Answer: A

Explanation: Faster ADCs and processors allow quicker display updates.

Q160. Optical fiber numerical aperture affects:

A) Light acceptance and coupling efficiency

B) Solar power

C) LCD voltage

D) Seven-segment IC

Answer: A

Explanation: NA defines the range of incident angles that propagate in the fiber.

Q161. In EDFA, signal gain depends on:

A) Pump power and fiber length

B) Solar irradiance

C) LCD contrast

D) Seven-segment brightness

Answer: A

Explanation: Proper pump power and fiber doping optimize amplification.

Q162. Fiber optic installation should maintain:

A) Minimum bend radius

B) Maximum voltage

C) LCD brightness

D) DPM resolution

Answer: A

Explanation: Prevents macrobending loss and fiber damage.

Q163. Multiplexing in fiber optic communication allows:

A) Multiple signals over single fiber

B) LCD control

C) DPM measurement

D) Solar MPPT

Answer: A

Explanation: Wavelength or time-division multiplexing increases fiber capacity.

Q164. Digital Panel Meter uses which component for analog-to-digital conversion?

A) ADC

B) LED

C) LCD segment

D) Fiber amplifier

Answer: A

Explanation: Converts analog electrical signal to digital form for display.

Q165. Optical fiber connector SC features:

A) Push-pull coupling mechanism

B) Bayonet coupling

C) Screw connector

D) Solar inverter

Answer: A

Explanation: Push-pull design provides secure, easy connection.

Q166. Fiber optic dispersion-shifted fiber is designed to:

A) Reduce chromatic dispersion at 1550 nm

B) Increase solar efficiency

C) Enhance LCD contrast

D) Improve DPM resolution

Answer: A

Explanation: Optimized refractive index profile reduces pulse spreading in C-band.

Q167. LCD in DPM enhances:

A) Digital readability and precision

B) Fiber coupling

C) Solar tracking

D) Seven-segment display

Answer: A

Explanation: Provides clear, accurate numerical readout.

Q168. Fiber optic attenuation due to bending is called:

A) Macrobending or microbending loss

B) Chromatic loss

C) Modal loss only

D) Solar tilt loss

Answer: A

Explanation: Bending causes light to escape core, reducing transmitted power.

Q169. Solar inverter efficiency improves with:

A) Reduced switching losses and MPPT

B) Fiber core alignment

C) LCD voltage

D) Seven-segment IC

Answer: A

Explanation: Efficient topology and tracking maximize PV output.

Q170. Optical fiber testing ensures:

A) Low loss, proper installation, fault detection

B) Solar irradiance

C) LCD contrast

D) DPM update rate

Answer: A

Explanation: Testing confirms integrity and performance of fiber link.

Q171. Optical fiber connector LC is preferred for:

A) High-density installations

B) Solar panel

C) LCD only

D) Seven-segment IC

Answer: A

Explanation: Small size allows multiple fibers in compact spaces.

Q172. Fiber optic insertion loss is caused by:

A) Connector, splice, misalignment

B) LCD brightness

C) Solar tilt

D) DPM ADC resolution

Answer: A

Explanation: Physical imperfections and misalignment reduce transmitted power.

Q173. Optical fiber backreflection can be minimized by:

A) Angled physical contact (APC) connectors

B) Solar tilt

C) LCD contrast

D) DPM ADC

Answer: A

Explanation: Angled end faces reduce reflected light returning into source.

Q174. EDFA pump laser wavelengths include:

A) 980 nm and 1480 nm

B) 850 nm only

C) 1310 nm only

D) 650 nm only

Answer: A

Explanation: Excites erbium ions for optical amplification in C-band.

Q175. DPM resolution improves with:

A) Higher ADC bit depth

B) Fiber core diameter

C) Solar tilt

D) LCD contrast

Answer: A

Explanation: More bits allow finer voltage/current measurements.

Q176. Seven-segment display driver IC simplifies:

A) Wiring and BCD-to-segment decoding

B) Fiber alignment

C) Solar tracking

D) LCD brightness

Answer: A

Explanation: Converts BCD input to proper segments, reducing wiring complexity.

Q177. Fiber optic cable outer jacket prevents:

A) Mechanical damage and environmental stress

B) Voltage drop

C) LCD contrast changes

D) DPM inaccuracy

Answer: A

Explanation: Protects delicate fibers from physical and environmental damage.

Q178. Solar inverter anti-islanding protects:

A) Maintenance personnel and grid equipment

B) Fiber link

C) LCD display

D) DPM measurement

Answer: A

Explanation: Disconnects inverter during grid outage to prevent hazards.

Q179. Optical fiber modal dispersion is minimized by:

A) Single-mode fiber

B) Multimode step-index fiber

C) Solar panel

D) LCD contrast

Answer: A

Explanation: Single mode ensures only one propagation path, reducing pulse spreading.

Q180. Digital Panel Meter uses sample-and-hold to:

A) Stabilize input signal for ADC

B) Fiber coupling

C) Solar MPPT

D) LCD brightness

Answer: A

Explanation: Captures input for precise conversion without fluctuation errors.

Q181. Fiber optic launch condition affects:

A) Mode excitation and loss

B) Solar PV output

C) LCD contrast

D) DPM update rate

Answer: A

Explanation: Improper launch excites unwanted modes, increasing dispersion and loss.

Q182. Optical fiber connector polishing affects:

A) Return loss and insertion loss

B) Solar irradiance

C) LCD brightness

D) Seven-segment IC

Answer: A

Explanation: Smooth surface ensures minimal signal reflection and attenuation.

Q183. Solar inverter synchronization is critical for:

A) Grid-tied operation

B) Fiber coupling

C) LCD contrast

D) DPM ADC

Answer: A

Explanation: Ensures voltage, frequency, and phase match grid before power injection.

Q184. Fiber optic OTDR measures:

A) Distance to fault, splice loss, overall attenuation

B) Solar efficiency

C) LCD brightness

D) DPM resolution

Answer: A

Explanation: Sends light pulses and analyzes reflections to detect faults.

Q185. LCD response time is affected by:

A) Liquid crystal type and driving voltage

B) Fiber core

C) Solar panel tilt

D) DPM ADC

Answer: A

Explanation: Determines how fast the display changes segments.

Q186. Digital Panel Meter input scaling is required to:

A) Match ADC range with measured signal

B) Fiber coupling

C) Solar MPPT

D) LCD contrast

Answer: A

Explanation: Ensures accurate digital conversion without overflow.

Q187. Optical fiber splice loss is typically:

A) 0.1–0.3 dB for fusion, 0.3–0.5 dB for mechanical

B) 5–10 dB

C) 10–20 V

D) 100 Ω

Answer: A

Explanation: Low-loss splicing maintains signal integrity.

Q188. Fiber optic connector APC is designed to:

A) Reduce backreflection

B) Increase solar output

C) Improve LCD contrast

D) DPM resolution

Answer: A

Explanation: Angled polish minimizes reflected light into source.

Q189. Solar inverter output waveform type is:

A) Pure or modified sine wave

B) DC only

C) Fiber light

D) LCD voltage

Answer: A

Explanation: AC output is compatible with appliances and grid.

Q190. Fiber optic cable bend radius must be:

A) Above minimum specified to prevent macrobending loss

B) Below minimum

C) Irrelevant

D) Solar panel dependent

Answer: A

Explanation: Ensures minimal loss and prevents fiber damage.

Q191. Seven-segment display decimal point allows:

A) Fractional numerical display

B) Fiber alignment

C) Solar tracking

D) LCD contrast

Answer: A

Explanation: Controlled separately for numerical precision.

Q192. EDFA gain can be saturated if:

A) Input signal power is too high

B) Fiber core diameter changes

C) Solar irradiance increases

D) LCD contrast rises

Answer: A

Explanation: Saturation limits further amplification.

Q193. Digital Panel Meter accuracy can be improved by:

A) Using high-resolution ADC and stable reference

B) Fiber alignment

C) Solar tilt

D) LCD brightness

Answer: A

Explanation: Stable reference and precise ADC reduce measurement error.

Q194. Fiber optic modal noise occurs due to:

A) Interference between modes in multimode fibers

B) LCD contrast

C) Solar PV efficiency

D) DPM ADC resolution

Answer: A

Explanation: Mode interference causes power fluctuations in multimode fibers.

Q195. Solar inverter efficiency is affected by:

A) MPPT accuracy and conversion losses

B) Fiber core diameter

C) LCD voltage

D) Seven-segment IC

Answer: A

Explanation: Precise MPPT and low losses maximize output.

Q196. Fiber optic cable color coding helps in:

A) Proper identification during installation

B) Solar PV output

C) LCD contrast

D) DPM ADC

Answer: A

Explanation: Ensures correct connections in multi-fiber cables.

Q197. Optical fiber attenuation due to scattering decreases with:

A) Increasing wavelength

B) Decreasing wavelength

C) Solar irradiance

D) LCD contrast

Answer: A

Explanation: Rayleigh scattering reduces as wavelength increases.

Q198. Digital Panel Meter overvoltage protection is done using:

A) Zener diodes or series resistors

B) Fiber alignment

C) Solar MPPT

D) LCD voltage

Answer: A

Explanation: Prevents ADC damage from excessive input voltage.

Q199. Fiber optic light source should match:

A) Fiber numerical aperture and core size

B) Solar panel efficiency

C) LCD voltage

D) DPM ADC

Answer: A

Explanation: Ensures efficient coupling and minimal loss.

Q200. Solar inverter MPPT increases energy harvest by:

A) Operating PV panel at maximum power point

B) Aligning fiber cores

C) Adjusting LCD contrast

D) Seven-segment brightness

Answer: A

Explanation: Continuous tracking maximizes power output under varying irradiance.