EEE 333 - Optical Communication Devices

LED and Laser Advantages MCQ Questions

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MCQ Questions

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1. Q Which of the following is an advantage of lasers over LEDs?

(a) Simpler fabrication process

(b) Lower cost

(c) Higher radiance

(d) Linear light output against current characteristic

1. A (c)

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2. Q What is one advantage of LEDs over lasers?

(a) Higher radiance and optical output power

(b) Narrow linewidth for minimizing material dispersion

(c) Simpler drive circuitry and lower drive currents

(d) Modulation capabilities in the gigahertz range

2. A (c)

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3. Q Which characteristic allows lasers to efficiently couple their output power into optical fibers?

(a) Simpler fabrication process

(b) Lower cost

(c) Good spatial coherence

(d) Immunity to gradual degradation

3. A (c)

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4. Q **LEDs are more suitable for applications requiring:**

(a) High radiance and optical output power

(b) Narrow linewidth for minimizing material dispersion

(c) Modulation capabilities in the gigahertz range

(d) Linear light output against current characteristic

4. A (d)

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5. Q **Which of the following is an advantage of lasers for high-capacity systems?**

(a) Simpler fabrication process

(b) Lower cost

(c) Relative temporal coherence for heterodyne detection

(d) Immunity to self-pulsation and modal noise problems

5. A (c)

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6. Q **LEDs are known for their:**

(a) High radiance and optical output power

(b) Narrow linewidth on the order of 1 nm or less

(c) Simpler drive circuitry and reduced temperature dependence

(d) Good spatial coherence for efficient coupling into optical fibers

6. A (c)

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7. Q **Which type of device has a linear light output against current characteristic?**

(a) Lasers

(b) LEDs

(c) Both lasers and LEDs

(d) Neither lasers nor LEDs

7. A (b)

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8. Q **Which device is generally more cost-effective to produce?**

(a) Lasers

(b) LEDs

(c) Both lasers and LEDs

(d) It depends on the specific application

8. A (a)

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9. Q **Which device is generally less sensitive to gradual degradation?**

(a) Lasers

(b) LEDs

(c) Both lasers and LEDs

(d) It depends on the specific application

9. A (b)

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10. Q **Which characteristic makes lasers more suitable for coherent detection in high-capacity systems?**

(a) Simpler fabrication process

(b) Lower cost

(c) Relative temporal coherence

(d) Simpler drive circuitry

10. A (c)

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11. Q **The simpler construction of LEDs contributes to:**

(a) Higher radiance and optical output power

(b) Reduced cost

(c) Immunity to self-pulsation and modal noise problems

(d) Linear light output against current characteristic

11. A (b)

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12. Q **What advantage do LEDs have in terms of temperature dependence?**

(a) Their light output against current characteristic is less affected by temperature

(b) Raising the temperature increases the threshold current, halting operation

(c) They exhibit catastrophic degradation at high temperatures

(d) They require temperature compensation circuits for proper operation

12. A (a)

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13. Q the LED is a threshold device and therefore raising the temperature increases the threshold current above the operating point and hence halt operation.

(a) True

(b) False

13. A (b)

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14. Q Which device exhibits a narrower linewidth on the order of 1 nm or less?

(a) Lasers

(b) LEDs

(c) Both lasers and LEDs

(d) Neither lasers nor LEDs

14. A (a)

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15. Q Which device requires lower drive currents and less complex drive circuitry?

(a) Lasers

(b) LEDs

(c) Both lasers and LEDs

(d) It depends on the specific application

15. A (b)