

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.
[Test Bank Beasley Modern Electronic Communication 9e nan](#)

- 1) Which of the following is NOT produced when two sine waves are combined through a nonlinear device?
- A) Harmonics of the two original frequencies
 - B) Components of each of the two original frequencies
 - C) Components at the sum and difference frequencies
 - D) an ac level

Answer: D

- 2) Which of the following is considered a nonlinear device?
- A) Resistor
 - B) Transistor
 - C) Potentiometer
 - D) Capacitor

Answer: B

- 3) Which of the following modulation techniques is the most economical?
- A) Low-level
 - B) High-level
 - C) Ultra low-level
 - D) Medium-level

Answer: B

- 4) If the % modulation of an AM transmitter is 60% and the unmodulated antenna current is 10 A, what is the modulated current?
- A) 11 A
 - B) 5 A
 - C) 14 A
 - D) 13 A

Answer: A

- 5) If the carrier transmits 12 kW, what is the modulated power from Problem 4?
- A) 16 kW
 - B) 14 kW
 - C) 12 kW
 - D) 10 kW

Answer: B

- 6) The reason modulation is used in electronic communication is:
- A) Efficient transmission and reception of radio waves are not possible unless extremely large antennas are used.
 - B) Since all intelligence signals occur at approximately the same frequency, there would be catastrophic interference problems if these frequencies were used.
 - C) Audio frequency radio waves do not propagate long distances very reliably
 - D) All of the above

Answer: D

- 7) Which of the following is not created by nonlinear mixing?
- A) dc (0 Hz)
 - B) The sum and difference of the two original frequencies
 - C) The original two frequencies
 - D) Harmonics of the sum and difference frequencies

Answer: D

- 8) A 2 kHz sinewave is mixed with a 1.5 MHz carrier sinewave through a nonlinear device. Which frequency is not present in the output signal?
- A) 3 MHz
 - B) 1.498 MHz
 - C) 3.004 MHz
 - D) 1.502 MHz

Answer: C

- 9) A 2.5 MHz carrier is modulated by a music signal that has frequency components ranging from 100 Hz to 5 kHz. What is the range of frequencies generated for the upper sideband?
- A) 2.5 MHz to 2.505 MHz
 - B) 2.5001 MHz to 2.505 MHz
 - C) 2.495 MHz to 2.499 MHz
 - D) 2.495 MHz to 2.505 MHz

Answer: B

10) Overmodulation:

- A) is undesirable because it produces sideband splatter.
- B) results when the modulation index exceeds unity.
- C) causes the AM signal to become distorted so that the receiver cannot produce a clean replica of the original intelligence signal.
- D) all of the above.

Answer: D

11) The total output power of an AM transmitter that is being operated at 50% modulation is measured to be 1800 watts. What is the carrier power?

- A) 1440 watts
- B) 2025 watts
- C) 1600 watts
- D) 900 watts

Answer: C

12) A 250W carrier is to be modulated at an 85% modulation level. What is the total transmitted power?

- A) 356.3 watts
- B) 340.3 watts
- C) 183.7 watts
- D) 430.6 watts

Answer: B

13) An AM broadcast station operates at its maximum allowed output power of 80W at a percent modulation of 60%. What is the upper sideband power?

- A) 18.47 watts
- B) 12.2 watts
- C) 6.1 watts
- D) 9.23 watts

Answer: C

14) The antenna current of an AM transmitter is 5A when it is not modulated. It increases to 6A when it is modulated. Its modulation index expressed as a percentage is:

- A) 83.3%
- B) 93.8%
- C) 63.2%
- D) 69.4%

Answer: B

15) An intelligence signal is amplified by a 65% efficient amplifier before being combined with a 250W carrier to generate an AM signal. If it is desired to operate at 100% modulation, what must be the dc input power to the final intelligence signal amplifier?

- A) 192.3W
- B) 162.5W
- C) 83.3W
- D) 384.6W

Answer: A

16) High-level modulation is used:

- A) in high-power applications such as standard radio broadcasting.
- B) when the intelligence signal is added to the carrier at the last possible point before the transmitting antenna.
- C) when the transmitter must be made as power efficient as possible.
- D) all of the above.

Answer: D

17) The process of neutralization is:

- A) a technique for filtering out all of the undesired frequencies produced by mixing action in a nonlinear amplifier except for the carrier, sum, and difference frequencies.
- B) placing a negative feedback capacitor in an RF amplifier to reduce the tendency for self-oscillation.
- C) the process of adjusting the percent modulation to its desired level in a modulator stage.
- D) the process of adjusting the tank circuit so that the transmitter produces the proper output frequency.

Answer: B

18) The O.T.A. is:

- A) a linear integrated circuit that creates AM with an absolute minimum of design considerations.
- B) an operational transconductance amplifier.
- C) a special type of op amp used to create an AM signal.
- D) all of the above.

Answer: D

19) The last stage of intelligence amplification before mixing with the carrier occurs in:

- A) the RF linear amplifier.
- B) the modulated amplifier
- C) the buffer.
- D) the modulator.

Answer: D

20) The equation defining the AM envelope is

- A) $e = E_c \sin \omega_c t$
- B) $e = E_i \sin \omega_i t + \sin \omega_c t$
- C) $e = E_c \sin \omega_c t \quad e = E_i \sin \omega_i t$
- D) $e = (E_c + E_i \sin \omega_i t) \sin \omega_c t$
- E) none of the above

Answer: D

21) The result of the trigonometric identity $(\sin x)(\sin y)$ is

- A) $0.5 \cos(x-y) - 0.5 \cos(x+y)$
- B) $\cos(x-y) - \cos(x+y)$
- C) $-0.5 \cos(x-y) + 0.5 \cos(x+y)$
- D) $-0.5 \cos(x-y) + \cos(x+y)$
- E) none of the above

Answer: A

22) The typical output impedance for an RF transmitter is

- A) 50
- B) 8
- C) 16
- D) 75
- E) none of the above

Answer: A

23) Determine the side frequency voltage if the modulation index is 70% and the carrier amplitude is 50V.

- A) 17.5
- B) 50
- C) 25
- D) 35
- E) none of the above

Answer: A