

**Chettinad**

College of Engineering &amp; Technology

Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai.

**Department of Electronics and Communication Engineering****EC8491 – Communication Theory****Unit I - MCQ Bank**

1. In Amplitude Modulation, the instantaneous values of the carrier amplitude changes in accordance with the amplitude and frequency variations of the modulating signal.  
(a) **True**  
(b) False
2. What is the circuit used for producing AM called?  
(a) **Modulator**  
(b) Transmitter  
(c) Receiver  
(d) Duplexer
3. The ratio between the modulating signal voltage and the carrier voltage is called?  
(a) Amplitude Modulation  
(b) Modulation frequency  
(c) **Modulation index**  
(d) Ratio of modulation
4. What is the percentage of modulation if the modulating signal is of 7.5V and carrier is of 9V?  
(a) 100  
(b) 91  
(c) **83.33**  
(d) 0
5. When does over-modulation occur?  
(a) Modulating signal voltage < Carrier voltage  
(b) **Modulating signal voltage > Carrier voltage**  
(c) Modulating signal voltage = Carrier voltage  
(d) Modulating signal voltage =0
6. What is the condition for greatest output power at the transmitter without distortion?  
(a) Modulating signal voltage < Carrier voltage  
(b) Modulating signal voltage > Carrier voltage  
(c) **Modulating signal voltage = Carrier voltage**  
(d) Modulating signal voltage =0

7. What is the modulation index value if  $V_{\max}=5.9\text{v}$  and  $V_{\min}=1.2\text{v}$ ?
- (a) 0.5
  - (b) **0.662**
  - (c) 0.425
  - (d) 0.14
8. What is the modulating signal voltage if the maximum and the minimum voltages on the wave was observed to be 5.9v and 1.2v respectively?
- (a) **2.35v**
  - (b) 2.12v
  - (c) 1.85v
  - (d) 3.21v
9. Modulation index of an AM signal is ratio of \_\_\_\_\_ to the \_\_\_\_\_
- (a) Peak carrier amplitude, Peak message signal amplitude
  - (b) **Peak message signal amplitude, Peak carrier amplitude**
  - (c) Carrier signal frequency, Message signal frequency
  - (d) Message signal frequency, Carrier signal frequency
10. Single sideband AM systems occupy same bandwidth as of conventional AM systems.
- (a) True
  - (b) **False**
11. AM demodulation technique can be divided into \_\_\_\_\_ and \_\_\_\_\_ demodulation.
- (a) Direct, indirect
  - (b) Slope detector, zero crossing
  - (c) **Coherent, noncoherent**
  - (d) Quadrature detection, coherent detection
12. Non coherent detection requires the knowledge of transmitted carrier frequency and phase at the receiver.
- (a) True
  - (b) **False**
13. A product detector in AM systems is also called \_\_\_\_\_
- (a) Envelope detector
  - (b) Differentiator
  - (c) Integrator
  - (d) **Phase detector**
14. AM system use only product detector for demodulation. They never use envelope detectors.
- (a) True
  - (b) **False**

15. The ability of the receiver to select the wanted signals among the various incoming signals is termed as
- (a) Sensitivity
  - (b) Selectivity**
  - (c) Stability
  - (d) None of the above
16. Super heterodyne receivers
- (a) Have better sensitivity
  - (b) Have high selectivity
  - (c) Need extra circuitry for frequency conversion
  - (d) All of the above**
17. The AM spectrum consists of
- (a) Carrier frequency
  - (b) Upper side band frequency
  - (c) Lower side band frequency
  - (d) All of the above**
18. Standard intermediate frequency used for AM receiver is
- (a) 455 MHz
  - (b) 455 KHz**
  - (c) 455 Hz
  - (d) None of the above
19. The modulation technique that uses the minimum channel bandwidth and transmitted power is
- (a) FM
  - (b) DSB-SC
  - (c) VSB
  - (d) SSB**
20. A modulation index of 0.5 would be same as
- (a) 0.5 of Modulation Depth
  - (b) 1/2% of Modulation Depth
  - (c) 5% of Modulation Depth
  - (d) 50% of Modulation Depth**
21. An AM broadcast station transmits modulating frequencies up to 6 kHz. If the AM station is transmitting on a frequency of 894 kHz, the values for maximum and minimum upper and lower sidebands and the total bandwidth occupied by the AM station are:
- (a) 900 KHz, 888 KHz, 12 KHz**
  - (b) 894 KHz, 884 KHz, 12 KHz
  - (c) 894 KHz, 888 KHz, 6 KHz
  - (d) 900 KHz, 888 KHz, 6 KHz

22. The total power in an Amplitude Modulated signal if the carrier of an AM transmitter is 800 W and it is modulated 50 percent.
- (a) 850 W
  - (b) 1000.8 W
  - (c) 750 W
  - (d) **900 W**
23. Calculate the power in one of the side band in SSBSC modulation when the carrier power is 124W and there is 80% modulation depth in the amplitude modulated signal.
- (a) 89.33 W
  - (b) 64.85 W
  - (c) **79.36 W**
  - (d) 102 W
24. Calculate the frequencies available in the frequency spectrum when a 2MHz carrier is modulated by two sinusoidal signals of 350Hz and 600Hz.
- (a) **2000.35, 1999.65 and 2000.6, 1999.4**
  - (b) 1999.35, 1999.65 and 2000.6, 2000.4
  - (c) 2000.35, 2000.65 and 2000.6, 2000.4
  - (d) 1999.35, 1999.65 and 1999.6, 1999.4
25. If an AM signal is represented by  
 $v = (15 + 3 \sin(2\pi * 5 * 10^3 t)) * \sin(2\pi * 0.5 * 10^6 t)$  volts
- i) Calculate the values of the frequencies of carrier and modulating signals.
  - ii) Calculate the value of modulation index.
  - iii) Calculate the value of bandwidth of this signal.
- (a) 1.6 MHz and 8 KHz, 0.6, 16 MHz
  - (b) 1.9 MHz and 18 KHz, 0.2, 16 KHz
  - (c) 2.4 MHz and 18 KHz, 0.2, 16 KHz
  - (d) **1.6 MHz and 8 KHz, 0.2, 16 KHz**
26. Calculate the power saved in an Amplitude Modulated wave when it is transmitted with 45% modulation
- Without carrier
  - Without carrier and a sideband
- (a) **90%, 95%**
  - (b) 82%, 91%
  - (c) 82%, 18%
  - (d) 68%, 16%
27. What is the carrier frequency in an AM wave when its highest frequency component is 850Hz and the bandwidth of the signal is 50Hz?
- (a) 80 Hz
  - (b) 695 Hz
  - (c) 625 Hz
  - (d) **825 Hz**

28. The antenna current of the transmitter is 10A. Find the percentage of modulation when the antenna current increases to 10.4A.
- (a) 32%
  - (b) 28.5%**
  - (c) 64%
  - (d) 40%
29. Function of RF mixer is
- (a) Addition of two signals
  - (b) Multiplication of two signals**
  - (c) Rejection of noise
  - (d) None of the above
30. Advantage of using VSB transmission is
- (a) Higher bandwidth than SSB
  - (b) Less power required as compared to DSBSC
  - (c) Both a and b**
  - (d) None of the above
31. Bandwidth required in SSB-SC signal is ( $f_m$  is modulating frequency):
- (a)  $2f_m$
  - (b)  $< 2f_m$
  - (c)  $> 2f_m$
  - (d)  $f_m$**
32. Ring modulator is
- (a) Is used for DSB SC generation
  - (b) Consists of four diodes connected in the form of ring
  - (c) Is a product modulator
  - (d) All of the above**
33. Generation of SSB SC signal is done by
- (a) Phase discrimination method
  - (b) Frequency discrimination method
  - (c) Product modulator
  - (d) Both a and b**
34. Limitations of Frequency discrimination method are:
- (a) Cannot be used for video signals
  - (b) Designing of band pass filter is difficult
  - (c) Both a and b**
  - (d) None of the above

35. Phase shift method is
- (a) Includes two balanced modulators
  - (b) Two phase shifting networks
  - (c) Avoids the use of filters
  - (d) All of the above**
36. Examples of low level modulation are
- (a) Square law diode modulation
  - (b) Switching modulation
  - (c) Frequency discrimination method
  - (d) Both a and b**
37. The advantages of using an RF amplifier are
- (a) Better sensitivity
  - (b) Improved signal to noise ratio
  - (c) Better selectivity
  - (d) All of the above**
38. In terms of signal frequency ( $f_s$ ) and intermediate frequency ( $f_i$ ), the image frequency is given by
- (a)  $f_s + f_i$
  - (b)  $f_s + 2f_i$**
  - (c)  $2f_s + f_i$
  - (d)  $2(f_s + f_i)$
39. Analog communication indicates:
- (a) Continuous signal with varying amplitude or phase
  - (b) No numerical coding
  - (c) AM or FM signal
  - (d) All of the above**
40. Disadvantage of using a DSB or SSB signal modulation is
- (a) Difficult to recover information at the receiver
  - (b) Carrier has to be locally generated at receiver
  - (c) Both a and b are correct**
  - (d) None of the above