

- ✓ Q1. A 320W carrier is simultaneously modulated by two audio waves with modulation % of 45 and 60 respectively. What is the side band power radiated?
- ✓ Q2. A 460-watt carrier is modulated to a depth of 65 percent. Calculate the total power in the modulated wave.
- Q3. The unmodulated rms current of an AM wave is 8.93A and it increases to 11.25A with modulation. Determine its modulation index.
- Q4. A sinusoidal carrier of 1MHz and amplitude of 100V is amplitude modulated by a sinusoidal modulating signal of frequency 5KHz providing 50 % modulation. Calculate the frequency and amplitude of USB & LSB.
- Q5. A certain AM transmitter radiates 9 KW with the carrier unmodulated and 10.125 KW when the carrier is modulated. Calculate the modulation index. If another sine wave is simultaneously transmitted with the modulation index 0.4, determine the total radiated power.
- Q6. AM radio transmitter transmits 6KW power when modulation % is 70. Determine the carrier power. Calculate the transmission efficiency if the modulation factor is 0.5.
- Q7. The antenna current of an AM transmitter is 8 A when only the carrier is sent, but it increases to 8.93 A, when the carrier is modulated by a single sine wave. Find percentage modulation. Determine the antenna current when the modulation index changes to 0.8.
- ✓ Q8. An Audio frequency signal $10 \sin(6\pi \times 400t)$ is used to amplitude modulate a carrier of $25 \sin(4\pi \times 10^5t)$. Calculate:
(i) Modulation Index
(ii) Amplitude of each side band
(iii) Total power delivered to a load of 2 Kohms
(iv) Bandwidth
(v) Transmission Efficiency
(vi) Draw frequency spectrum of AM wave.
- ✓ Q9. Calculate the percentage saving when the carrier and one of the sidebands are suppressed in an AM wave to a depth of (a) 100% (b) 50%.
- Q10. A 400W carrier is amplitude modulated to a depth of 100 %. Calculate the total power in case of SSB technique. How much power saving is there in SSBSC as compared to AM and DSBSC? If the modulation % is changed to 75, how much power is required to transmit SSBSC? Compare the powers for SSBSC in both the cases and comment.

Q11. A SSBSC transmitter radiates 0.5 KW when the modulation % is 60. How much carrier power is required if we want to transmit the same the message by AM transmitter? A DSBSC transmitter radiates 1KW when the modulation % is 60. How much carrier power is required if we want to transmit the same the message by AM transmitter?

Q12. A 400W carrier is amplitude modulated to a depth of 100 %. Calculate the total power in case of DSBSC technique. How much power saving is there in DSBSC as compared to AM? If the modulation % is changed to 75, how much power is required to transmit DSBSC? Compare the powers for DSBSC in both the cases and comment.

Q13. The antenna current of an AM broadcast transmitter modulated to a depth of 40% by an audio sine wave is 11A. It increases to 12A because of simultaneous modulation by another sine wave. What is the modulation index due to this second wave.

Q14. Explain the amplitude modulation and demodulation techniques with necessary diagram and equations.

✓ Q15. Explain the basic element of communication system with necessary block diagram.

Q16. What is meant by satellite communication? Describe its block diagram and mention its applications.

Q17. Define Modulation and explain its need in communication systems.

✓ Q18. Derive an expression for amplitude modulated wave. Also derive the relation of total power of AM wave.

Q19. With the help of a suitable block diagram, explain how radar is used in communication.

Q20. Write a short note on evolution of wireless mobile communication.

[illegible]