Continuing Education Course #075
QAM Digital Communications

1. Shannon's equation shows that channel capacity depends on:
- ○ a. the channel bandwidth,
- ○ b. the channel Signal-to-Noise Ratio (SNR),
- ○ c. both of the above.

2. Shannon's equation reveals how to achieve the channel capacity:
- ○ a. True,
- ○ b. False.

3. Classical analog steady state signals are decomposed into:
- ○ a. constants only,
- ○ b. rectangular wave shapes,
- ○ c. sine wave shape with a magnitude and phase,
- ○ d. triangular wave shapes.

4. For an analog system to have a transfer function, it must:
- ○ a. be linear,
- ○ b. be causal,
- ○ c. be time invariant.
- ○ d. all of the above.

5. Multiplication of sinusoids is an operation with a transfer function description:
- ○ a. True,
- ○ b. False.

6. A single pole lowpass filter produces a group delay in its pass band:
- ○ a. True,
- ○ b. False.

7. Sampling an analog system produces a wide-band spectrum:
- ○ a. True,
- ○ b. False.

8. The "Nyquist" frequency is what fraction of the sampling rate:
- ○ a. one fourth,
- ○ b. one half,
- ○ c. three quarters,
- ○ d. they are equal.

9. Sampling with a Zero-Order Hold is equivalent to a delay of:

○ a. one quarter of the sampling period,
○ b. one half of the sampling period,
○ c. three quarters of the sampling period,
○ d. one sampling period.

10. The original Weaver architecture uses suppressed carrier modulation :
○ a. True,
○ b. False.

11. The analog multiplication of two sine wave signals produces a result at the sum of the individual frequencies:
○ a. True,
○ b. False.

12. The Weaver modulator produces single sideband suppressed carrier from double sideband suppressed carrier signals:
○ a. True,
○ b. False.

13. The digital Weaver modulator has fewer high order harmonics than the analog version:
○ a. True,
○ b. False.

14. Filters are used to suppress harmonic energy in the Weaver architecture:
○ a. True,
○ b. False.

15. Phase modulation of the Weaver architecture supports selection of upper or lower sideband outputs by changing either channel phase by 180 degrees:
○ a. True,
○ b. False.

16. The Weaver modulator can be used as a transmitter, a receiver, or both in a single sideband communications system:
○ a. True,
○ b. False.

17. A reduced Weaver modulator produces QAM using the following modulation:
○ a. Phase modulation of I & Q channels,
○ b. Amplitude modulation of I & Q channels,
○ c. all of the above.
○ d. none of the above.

18. A reduced Weaver modulator producing QAM has independent I and Q channels:
○ a. True,
○ b. False.

19. In the QAM scheme in the example constellation, the bit rate and baud rate are identical:
○ a. True,
○ b. False..

20. In the QAM receiver in the example, the I and Q channels are reconstructed without any uncertainties:
○ a. True,
○ b. False.

21. The suppressed carrier frequency from a double sideband suppressed carrier cannot be reconstructed from the signal:

- a. True,
- b. False.

22. The techniques used in the example employed frequencies that are close to each other for illustration purposes:

- a. True,
- b. False.

23. QAM uses only a single sideband, much like the original Weaver architecture:

- a. True,
- b. False.

24. Impulse waveform sampling is used to provide a discrete-time representation of a continuous analog signal:

- a. True,
- b. False.

25. Digital communication technology supports error free communication under some circumstances.:

- a. True,
- b. False.