

King Fahd University of Petroleum and Minerals

University Diploma Programs Electronic Equipment Maintenance

EET 029, Introduction to Communication

MAJOR EXAM # 2

Date: 27th December 2003.

Instructor: M. Ajmal Khan, Lecturer, EE Dept.

Student's Name : _____ ID # : _____

Time Allowed: 1 Hour 30 minutes.

QUESTION #	POINTS	SCORE
1	20	
2	18	
3	3	
4	2	
5	8	
6	4	
Total	55	

Question # 1: Circle the correct Answer for each of the following questions:

- i. If either the capacitance or inductance of an LC oscillator tank is varied, then which of the following modulation will result:
 - a. Amplitude Modulation
 - b. Frequency Modulation
 - c. FM-AM modulation
 - d. Pulse modulation.

- ii. The direct modulators have the following disadvantage of being based on an LC oscillator.
 - a. It is stable enough for communications.
 - b. It is not stable enough for communications.
 - c. None of the above.

- iii. A crystal oscillator is used to generate FM through phase modulation. This method is called:
 - a. Direct Method
 - b. Varactor Diode modulator
 - c. Reactance Modulator
 - d. Armstrong System.

- iv. Which of the following is a Direct way of generating FM. (Check all that apply).
 - a. Reactance FET modulator
 - b. Varactor diode modulator
 - c. Reactance bipolar transistor modulator
 - d. Armstrong modulator

- v. Some power is absorbed and the rest is reflected, if:
 - a. Load impedance is not equal to characteristic impedance.
 - b. Load impedance is equal to characteristic impedance.
 - c. None of the above.

- vi. The minimum directive gain is known as:
- Directivity
 - Power Gain
 - Power density
 - None of the above.
- vii. The length of basic Marconi antenna is:
- $\lambda/4$
 - λ
 - 4λ
 - None of the above.
- viii. The effect of top loading in antenna is _____ at the base of the antenna.
- To increase the voltage.
 - To decrease the voltage
 - To increase the current
 - To decrease the current.
- ix. Which of the following works if synchronization between transmitter and receiver fails.
- PPM
 - PWM
 - PAM
 - None of the above.
- x. Which of the following requires powerful transmitter.
- PPM
 - PWM
 - PAM
 - None of the above.
- xi. Which one is correct:
- The trailing edges of PWM are position modulated.
 - The leading edges of PWM are position modulated.
 - The center point of the pulse are position modulated.
 - None of the above.

xii. Which one of the following has low noise immunity:

- a. PWM.
- b. PPM.
- c. PCM
- d. PAM

xiii. In delta modulation, how many bits are sent per sample?

- a. 1
- b. 2
- c. 4
- d. 8

xiv. To permit the selection of 1 out of 16 equiprobable events, the number of bits required is:

- a. 2
- b. $\log_{10} 16$
- c. 4
- d. 8

xv. Indicate the false statement. In order to combat noise:

- a. Redundancy may be used.
- b. The channel bandwidth may be increased.
- c. The transmitted power may be increased
- d. The signaling rate may be reduced.

xvi. Quantizing noise occurs in:

- a. FM
- b. PWM
- c. PPM.
- d. PCM

xvii. In order to reduce quantizing noise, one must:

- a. Increase the number of standard amplitudes.
- b. Send pulses whose sides are more nearly vertical.
- c. Use an RF amplifier in the receiver.
- d. Increase the number of samples per second.

xviii. Companding is used:

- a. To overcome quantizing noise in PCM
- b. In PCM transmitters, to allow amplitude limiting in the receivers.
- c. In PCM receivers, to overcome impulse noise.
- d. To protect small signals in PCM from quantizing distortion.

xix. The biggest disadvantage of PCM is:

- a. The large bandwidths that are required for it.
- b. Its inability to handle analog signals.
- c. The high error rate which its quantizing noise introduces.
- d. Its incompatibility with TDM.

xx. Digital signals:

- a. Do not provide a continuous set of values.
- b. Represent values as discrete steps.
- c. Can utilize decimal or binary systems.
- d. All of the above.

Question # 2: Define the following terms: (18 points)

(a) Half-wave Dipole:

(b) Elementary Doublet

(c) Non-Resonant Antenna

(d) Directive Gain

(e) Radiation Resistance

(f) Information.

Question # 3: Write the name of three electronic devices whose reactance can be varied by the application of voltage. (3 points)

Question # 4: What is the main application of Loop Antenna? (2 points)

Question # 5: A system has a bandwidth of 4 kHz and a signal-to-noise ratio of 28 dB at the input to the receiver. Calculate its information-carrying capacity. (8 points)

Question # 6: How many number of bits of information are required to enable the correct selection of one event from a set of 256 equiprobable events.
(4 points)