

King Fahd University of Petroleum and Minerals

University Diploma Programs Electronic Equipment Maintenance

EET 029, Introduction to Communication

FINAL EXAM

Date: 11th January 2004.

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

Student's Name : _____ ID # : _____

Time Allowed: 90 minutes

QUESTION #	POINTS	SCORE
1	20	
2	10	
3	5	
4	5	
5	5	
6	10	
Total	55	

Question # 1: Circle the correct Answer for each of the following questions:
(20 points)

- i. Digital communication utilizes:
 - a. Continuous signal.
 - b. Discontinuous signal
 - c. Analog signal
 - d. None of the Above.

- ii. The binary set of 10 bits has the following number of possible combinations:
 - a. 1000
 - b. 2048
 - c. 20
 - d. 100
 - e. None of the Above.

- iii. Any transmission system which conveys more than one signal simultaneously can experience:
 - a. Distortion
 - b. Echo
 - c. Crosstalk
 - d. Noise

- iv. Phase delay distortion is reduced by using the following equipment:
 - a. Equalizers.
 - b. Echo suppressors
 - c. Multiplexer
 - d. Demultiplexer

- v. When signals of one frequency are passed through the circuit at a different speed than other signals, it is known as:
 - a. Echo
 - b. Crosstalk
 - c. Phase delay distortion
 - d. Noise

- vi. Which of the following are error detection codes: (Check all that apply)
- a. Constant-Ratio codes.
 - b. Redundant codes
 - c. Parity-check codes.
 - d. 5-Bit baudot code.
 - e. ASCII code.
- vii. How many number of 1's and 0's are present in every code group of 4-out-of-10 code.
- a. Six 1's and Four 0's
 - b. Four 1's and Ten 0's
 - c. Ten 1's and Four 0's
 - d. Four 1's and Six 0's
- viii. In which of the following codes, the message is transmitted twice for error checking:
- a. Forward error correcting codes.
 - b. Constant-ratio codes
 - c. Parity-check codes
 - d. None of the above.
- ix. In hagelbarger codes:
- a. One parity bit is sent after each data bit.
 - b. One parity bit is sent at the beginning of each data bit.
 - c. One parity bit is sent after each character code block.
 - d. One parity bit is sent at the beginning of each character code block.
- x. In bose-chaudhuri code, the redundancy is:
- a. 50 percent.
 - b. 100 percent
 - c. 75 percent
 - d. 25 percent
 - e. 0 percent

- xi. The process of Amplitude Modulation shifts the spectrum of the modulating signal to _____ by ω_c .
- Either left or right.
 - The left only
 - The right only
 - The left and the right
- xii. The modulation index is a number lying between:
- 0 and 100
 - 1 and 100
 - 0 and 10
 - 0 and 1
- xiii. Amplitude modulation is used for broadcasting because:
- It is more noise immune than other modulation systems
 - Compared with other systems it requires less transmitting power
 - Its use avoids receiver complexity
 - No other modulation system can provide the necessary bandwidth for high fidelity.
- xiv. In SSB modulation, the modulated signal spectrum is composed of :
- Three parts; USB, LSB and Carrier
 - two parts; USB and LSB
 - three parts; USB, LSB and reduced carrier.
 - None of the above.
- xv. The balanced modulator is used:
- to add full carrier
 - to add a reduced carrier
 - to suppress LSB.
 - to suppress USB.
 - None of the above.

- xvi. Which of the following is a disadvantage of FM over AM:
- FM requires much narrower channel than AM.
 - FM requires much wider channel than FM.
 - FM equipments are less complex than AM.
 - Area of reception for FM is much broader than for AM.
- xvii. FM reception is more immune to noise than AM reception because:
- Area of reception for FM is much broader than for AM.
 - FM equipments are less complex than AM.
 - In FM frequency is variable.
 - FM receivers can be fitted with amplitude limiters.
- xviii. A half-duplex modem provides transmission:
- In only one direction.
 - In both directions at the same time.
 - None of the Above.
- xix. The block code 1010111000 has the following parity bit:
- 1
 - 0
 - 10
 - 11
 - 5
- xx. Digital signals:
- Provides a continuous set of values.
 - Represent values as discrete steps.
 - Can utilize sine wave.
 - All of the above.

Question # 2: In Frequency Division Multiplexing, One basic group consists of: (10 points)

(a) No. of Adjacent Channels: _____

(b) Frequency band of each channel: _____

(c) Frequency range: _____ to _____

(d) Pilot Frequency: _____

One super group consists of:

(e) No. of Basic groups: _____

(f) Frequency range: _____ to _____

(g) Pilot Frequency: _____

Question # 3: A 24-channel system has sampling rate of 8000 samples per second, 8 bits per sample and pulse width of $0.625 \mu\text{s}$. Write the answers of the following questions: (5 points)

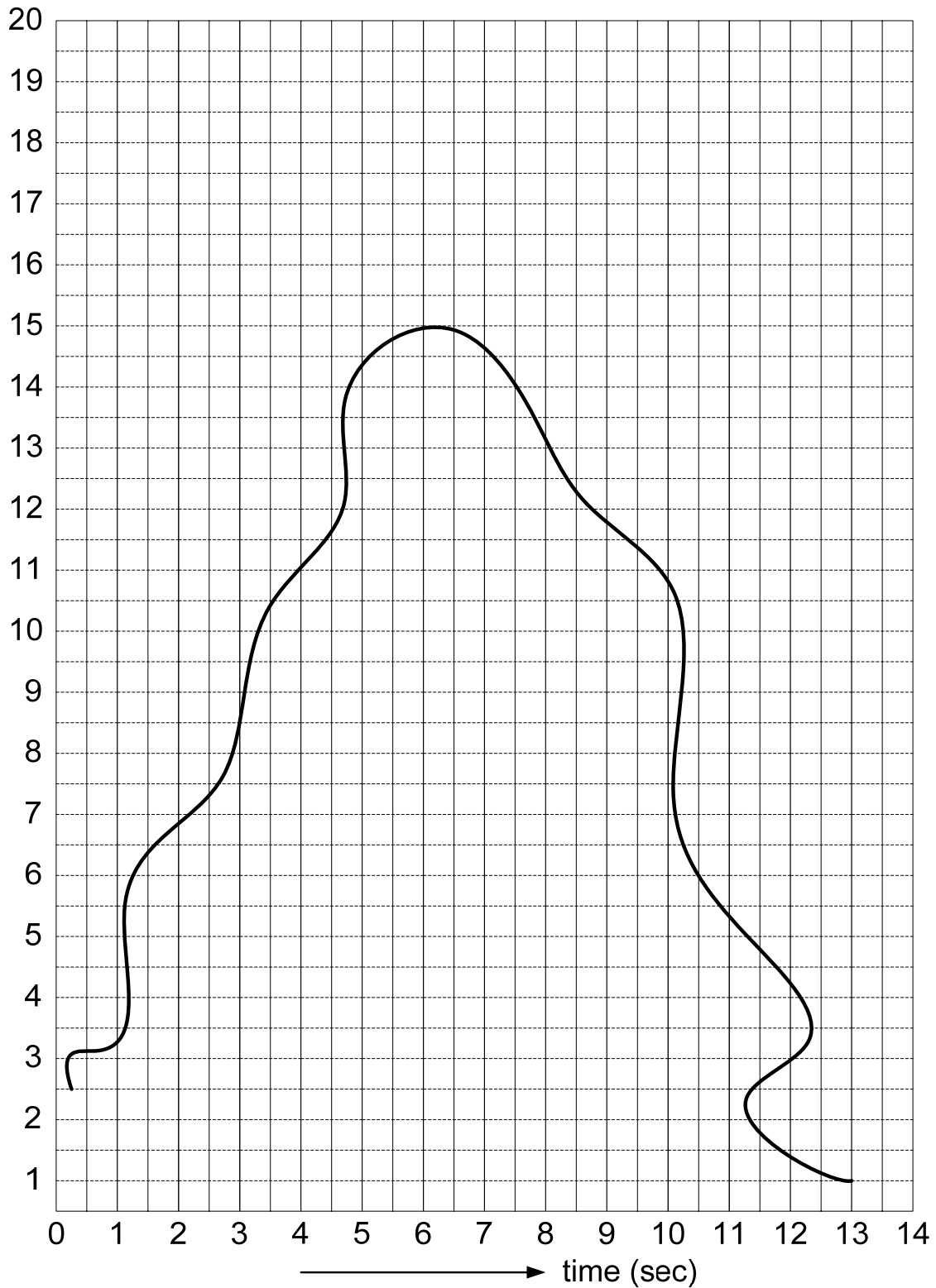
Sampling Interval: _____

Period for each pulse group: _____

Question # 4: write the principle of Automatic Repeat Request (ARQ) system. (5 points)

Question # 5: Calculate the transmission efficiency of a system transmitting 200 information bits and 100 redundant bits for error detection. (5 points)

Question # 6: Apply PCM in the signal given in the following figure. Find the samples of the signal with a time interval of 1 second and calculate the quantized values and write its binary code. (10 points)



TIME	Sample Value	Quantized Value	Binary Code
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			