Kaferelsheikh University
Department of Electrical Engineering
Subject: Electronic measurement and Tests (2)
Academic Number: ECE4013
Full Mark: 40 degree **Date: 9 /1/2020**

Faculty of Engineering
Year: 4th Electronics and Electrical Communications
Final Exam: 2 pages
Time allowed: 3 h

This Exam measures the ILOs [a8, a15, b15, b16 and c18]

Answer the following questions:

[1] Question One: (12 Mark) *measures ILOs of a15, b15, b16 and c 18]*

A- i- **Explain** the process of non- uniform quantization in PCM system, illustrating why it is needed.

ii - Find the step size required to prevent slope overload noise as a function of the frequency of the highest-frequency component of the signal. Assume that all components have amplitude *A*. (5-marks)

B- An input data stream" 0110010110011" is passed through a line encoder circuit, the oscilloscope is used to see the output stream, draw the signal that will be seen in case of
i- BRZ ii- Manchester iii- Differential encoders
Then draw the circuit diagram of Manchester encoder (4-marks)

C- Explain the operation of BFSK demodulator, based on coherent recovery and specify the output of each stage (3-marks)

[2] Question Two: (8 Mark) *[measures ILOs of a15 and b15]*

A- Draw the spectrum of both ASK and M-ary FSK, and hence deduce the null to null bandwidth in each case (2-marks)

B- Write down a matlab code to plot the variation of the bit error rate versus the signal to noise ratio in case of QPSK. (3-marks)

D- Construct an electronic circuit that can be used to generate pulse position modulation. (3-marks)

[3] Question three: (10 Mark) *[measures ILOs of a8 and b16]*

A) Sketch the circuit diagram to study the characteristics of the reflex klystron tube and to determine its electronic tuning range, then explain the function of each component. (4-marks)

B) Explain the principle operation of Transferred Electron Devices (TED's), "THEORY". (2-marks)

C) Sketch the circuit diagram to study the characteristics of Gunn Diode and to determine the threshold voltage, then explain its procedure. (4-marks)

[4] Question four: (10 Mark) *[measures ILOs of a8 and b16]*

A) What is the principle involved in Gunn diode? (3-marks)

B) Design circuit to determine the frequency and wavelength of a microwave in a rectangular waveguide operated in TE10 mode. **Then explain** the mechanic techniques and electronic Technique and **bring out** a relationship between the guide wave length and cut of wavelength? (5-marks)

C) What is the purpose of slotted line in the microwave bench? (2-marks)

Best Wishes

Committee of Correctors and Testers

Dr. Noha El-shalaby

Dr. Shamia Ghamry