



MACHAKOS UNIVERSITY

University Examinations for 2021/2022

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING

FOURTH YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (ELECTRICAL AND ELECTRONICS ENGINEERING)

EEE402 COMMUNICATION SYSTEM II

DATE: 10/12/2021

TIME: 2.00-4.00 PM

INSTRUCTIONS:

Instructions to candidates

This paper consists of **FIVE** (5) questions.

Answer **QUESTION ONE** (1) and any other **TWO(2)** questions.

Marks for each question are as indicated

You should have the following for this examination:-

1. Answer booklet;
2. Non-programmable scientific calculator;
3. Writing instruments.

SECTION A (COMPULSORY): ANSWER ALL QUESTIONS

QUESTION ONE (30 MARKS)

- | | | |
|----|--|-----------|
| a) | Do a comparison of Binary and Duo Binary signaling | (4 Marks) |
| b) | Diffrentiate between Detector, Actuator and transducer | (2 Marks) |
| c) | Define Guard Time, what's the significance | (2 Marks) |
| d) | What is slope overload error | (2 Marks) |
| e) | Define the impulse response of matched filter | (2 marks) |

- f) What is the difference between coherent and non-coherent receiver (2 Marks)
- g) Sketch a well labelled basic block diagram of the generalized Medical Instrument System using sensors to measure a signal with data acquisition and control. (6 Marks)
- h) Define S/N ratio, what's the significance of the ratio (2 Marks)
- i) Show the importance of digital communication (4 Marks)
- j) What are the effects of not properly sampling a given signal, Calculate the sampling rate of signal where $x(t)=500 \cos 90$ (4 Marks)

SECTION B: ANSWER ANY TWO (2) QUESTIONS

QUESTION TWO (20 MARKS)

- a) Discuss the various types of non-uniform quantization and while at it show its significance (8 Marks)
- b) Give a Detailed explanation and use diagram where necessary to explain the conversion of a digital to analog signal (12 Marks)

QUESTION THREEE (20 MARKS)

- a) With an aid of a diagram describe the indirect method of generating a Frequency modulation (10 Marks)
- b) Briefly explain the operation of antenna subsystem (5 Marks)
- c) Explain the operation of TDM (5 Marks)

QUESTION FOUR (20 MARKS)

- a) With an aid of a diagram show the functioning of a superhetrodyne receiver (8 Marks)
- b) Demonstrate how adaptive pulse code modulation is a better form of modulation (6 Marks)
- c) Show how pre emphasis and de emphasis is used in a n FM system (6 Marks)

QUESTION FIVE (20 MARKS)

- a) Discuss TWO (2) types of Line coding (4 Marks)
- b) Compare QPSK to BPSK (8 marks)
- c) Demonstatre how frequency spread spectrum is achieved and give some of the application of spread spectrum (8 Marks)