MACHAKOS UNIVERSITY

University Examinations 2017/2018

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING

FOURTH YEAR SECOND SEMESTER EXAMINATIONS FOR BACHELOR OF SCIENCE IN ELECTRICAL AND ELECTRONIC ENGINEERING

EEE 401 COMMUNICATION II

DATE: 11/12/2017 **TIME: 8.30-10.30 AM**

INSTRUCTIONS

Answer Question One And Any Other Two Questions

QUESTION ONE (COMPULSORY) (30 MARKS)

a) Explain with an aid of typical block diagram, the operation of a digital communication system model (3 marks)

b) Describe briefly how bit error rate of the communication system can be improved (3 marks)

c) Explain why the quantization noise cannot be removed completely in PCM? How do you reduce this noise? (4 marks)

d) Illustrate two types of uniform quantizer hence describe briefly how it differ with non-uniform quantization (4 marks)

e) Define the term Nyquist theorem hence solve for Nyquist sampling rate when the signal $m(t) = 3 \cos 500\pi t + 4 \sin 1000 \pi t$ (3 marks)

f) Describe brief the term Inter-symbol Interference (ISI) and give the reason for its occurrence and cause (5 marks)

g) Explain how QPSK differs from PSK in term of transmission bandwidth and bit information it carries (2 marks)

h) i. Differentiate between Coherent and Non Coherent detection scheme (2 marks)

ii. Highlight the properties of cyclic code of base band digital communication (2 marks)

iii. State the Condition that satisfies hamming code. (2 marks)

QUESTION TWO (20 MARKS)

a) Discuss in details about the mathematical mode of any two channel of communication system (8 marks)

b) Describe how PWM and PPM signal are generated (8 marks)

c) Distinguish between base band and band pass signaling (4 marks)

QUESTION THREE (20 MARKS)

a) Describe how the noise in delta modulation system is suppressed (12 marks)

b) Explain the operation of Differential Pulse Code Modulation (DPCM) system, derive its expression for slope overload noise and Show that the SNR of DPCM is better than of PCM (8 marks)

QUESTION FOUR (20 MARKS)

a) Explain the functional block of QPSK transmitter and receiver communication model. (8 marks)

b) Obtain the probability of bit error rate for coherently detected BPSK and compare its probability of bit error performance with QPSK scheme (12 marks)

QUESTION FIVE (20 MARKS)

a) With an aid of block diagram, describe the operation of adaptive sub band coding scheme for speech signal (6 marks)

b) Discuss the concept of error free communication system (6 marks)

c) Describe the properties of line codes used in the channel of a communication model system (8 marks)