



MACHAKOS UNIVERSITY COLLEGE

(A Constituent College of Kenyatta University)
University Examinations for 2015/2016 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

SECOND SEMESTER EXAMINATION FOR DIPLOMA IN ELECTRICAL AND
ELECTRONICS ENGINEERING

EED 317: TELECOMMUNICATION PRINCIPLES

DATE: 5/8/2016

TIME: 8:30 – 10:30 AM

INSTRUCTIONS

- Question one is compulsory
- Do any other two questions
- Neat work recommended.

QUESTION ONE (COMPULSORY) (30 MKS)

- a) Define the following terms.
- i) Carrier frequency
 - ii) Modulating frequency
 - iii) Band-width (10 marks)
- b) Explain both amplitude and frequency modulation operations. (8 marks)
- c) A sinusoidal carrier of frequency 1200 KHz is amplitude modulated by a sinusoidal voltage of frequency of 20 KHz resulting in maximum and minimum modulated carrier amplitudes of 110 volts and 90 volts respectively. Calculate:-
- i) The upper and the lower side band frequencies.
 - ii) The un-modulated carrier amplitude (8 marks)

- iii) List any four advantages of Fm signals as compared to Am counterparts (4 marks)

QUESTION TWO (20 MKS)

- a) A super heterodyne radio receiver has an intermediate frequency (I.F) of 465 KHZ and is tuned to 1065 KHZ. Calculate.
- i) The frequency of the local oscillator.
 - ii) The frequency of the image signal (6 marks)
- b) With aid of a diagrams, differentiate between an emphasis and de-emphas circuits. (4 marks)
- c) Describe low and high level transmitters (10 marks)

QUESTION 3 (20 MKS)

- a) Explain any four noise available in communication devices. (8 marks)
- b) A resistor of value 20 KHZ is connected at the input of an amplifier operating over the frequency range 10 Mhz to 11 Mhz compute the rms noise voltage at the input of the amplifier if the temperature is 24⁰c. Take boltzmans constant = 1.38×10^{-23} (10 marks)
- c) Define pulse code modulation PCM (2 marks)

QUESTION FOUR (20 MARKS)

- a) Show the frequency classifications as allowed by the international telecommunication union (I. T.U) (10 marks)
- b) Explain the following as applied to electromagnetic signals.
- i) Attenuation
 - ii) Diffraction
 - iii) Absorption (6 marks)
- c) Explain the behavior of Ionosphere layer in terms of Electromagnetic waves. (4 marks)

QUESTION FIVE (20 MARKS)

- a) Differentiate between general and selective fading in Am transmissions. (4 marks)
- b) Give three advantages of single side band (S.S.B) as compared to double side band (D.S.B) operations. (6 marks)
- c) With aid of block diagrams explain an ssb drive unit of a transmitter. (10 marks)