



MACHAKOS UNIVERSITY

University Examinations 2018/2019

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

FIRST YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE (ELECTRICAL AND ELECTRONIC ENGINEERING)

SPH 104: INTRODUCTION TO TELECOMMUNICATION

DATE: 27/9/2019

TIME: 8:30 – 10:30 AM

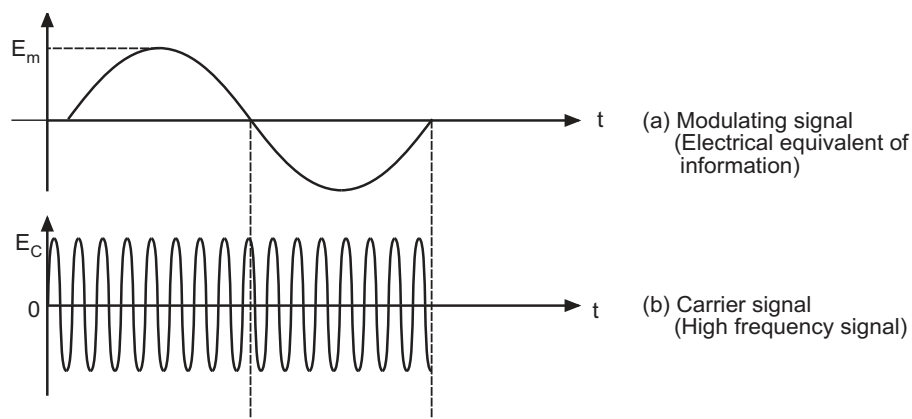
INSTRUCTIONS

Answer Question one and any other two

QUESTION ONE {30 MARKS, COMPULSORY}

- (a) Explain 5 advantages of modulation 5 marks
- (b) The following is provided as the shape of the carrier and the message signal. Sketch the output waveform in case each of the following modulation schemes 6 marks
- (i) Amplitude
 - (ii) Frequency
 - (iii) Phase

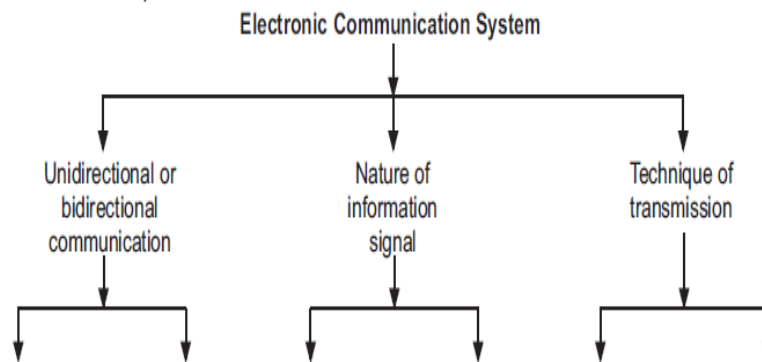
Give the assumptions made in each case



- (c) Differentiate between the following terms 6 marks
- (i) Multiplexing and modulation
 - (ii) Baseband and broadband communication
- (d) Define the following technologies 3 marks
- (i) Telex
 - (ii) Facsimile
 - (iii) Telegraph
- (e) Draw a well labeled diagram of a communication system and explain the function of each block 10 marks

QUESTION TWO {20 MARKS}

- (a) Discuss the three main communication channel medium and give two example of each 9 marks
- (b) Complete the diagram below with the types of communication system classification 8 marks



- (c) Explain the role played by pre-emphasis and de-emphasis circuit in a FM communication 3 marks

QUESTION THREE {20 MARKS}

- (a) A modulating signal $10 \sin (2\pi \times 10^3 t)$ is used to modulate a carrier signal $20 \sin (2\pi \times 10^4 t)$. Find: 12 marks
- (i) Modulation index
 - (ii) Percentage modulation
 - (iii) Sideband frequencies and their amplitude
 - (iv) Bandwidth of AM wave
 - (v) Draw the frequency spectrum.
- (b) Explain 3 advantages, 3 disadvantages and 2 application of amplitude modulation 8 marks

QUESTION FOUR {20 MARKS}

- (a) Draw a well labelled diagram of a Tuned Radio Frequency (TRF) Receiver 10 marks
- (a) Explain 5 historic discoveries that helped in creation and enhancement of telecommunication 10 marks

QUESTION FIVE {20 MARKS}

- (a) Define the following terms as used in radio receivers 3 marks
- (i) Sensitivity
 - (ii) Selectivity
 - (iii) Fidelity
- (b) Draw a well labelled diagram of an FM Superhetrodyne radio receiver 12 marks
- (c) Explain 5 factors that affect the choice of the value of intermediate frequency (IF) used in a receiver 5 marks