UNIVERSITY OF EMBU

<u>2017/2018 ACADEMIC YEAR</u>

<u>SECOND SEMESTER EXAMINATIONS</u>

<u>FIRST YEAR EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE (COMPUTER SCIENCE) AND BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY)</u>

<u>CSC 123/SIT123: DATA COMMUNICATIONS</u>

DATE: APRIL 12, 2018   TIME: 11:00 PM – 1:00 PM

INSTRUCTIONS:

Answer Question ONE and ANY other two Questions

QUESTION ONE (30 MARKS)

a) Differentiate between Twisted pair, coaxial cable and fiber optics cables.   (3 marks)

b) Explain the different types of transmission impairments.   (3 marks)

c) Explain broadcast network, point to point network and Multipoint networks.   (3 marks)

d) Draw components of data communication system and state function of each component.

(4 marks)

e) Enumerate the four classification of line encoding schemes.   (4 marks)

f) Explain the importance of the data terminal equipment, Data communication equipment as applied in data communications.   (4 marks)

g) Describe any three error detection methods.   (3 marks)

h) Using Nyquist Bit rate, calculate the maximum bit rate of a noiseless channel with a bandwidth of 5000 Hz transmitting a signal with two signal levels.

(4 marks)

i) Briefly explain the need for standards in computer networks.   (2 marks)

QUESTION TWO (20 MARKS)

a) You have one hub and four computers. Draw a sketch to show how the hub and computers can be connected to implement a star toplogy.Explain the advantages and disadvantages of the star topology. (10 marks)

b) Describe the importance of modulation. Briefly explain the various modulation techniques used in computer communication to convert analog signal to digital signal. (10 marks)

QUESTION THREE (20 MARKS)

a) Discuss any five criteria used to evaluate data transmission medium and equipment's.

(10 marks)

b) Discuss the criteria necessary for an effective and efficient network giving examples.

(10 marks)

QUESTION FOUR (20 MARKS)

a) Write short notes on the types of errors that may occur during transmission over the network

(10 marks)

b) Describe Redundancy check methods commonly used in data transmission. (10 marks)

QUESTION FIVE (20 MARKS)

a) Explain the ISO-OSI model of computer network with a neat diagram indicating which devices operates at which layers. (10 marks)

b) What is Ethernet? Explain all 3 types of Ethernet in detail. (10 marks)

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