MACHAKOS UNIVERSITY COLLEGE

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

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

FIRST SEMESTER EXAMINATION FOR DEGREE IN

BACHELOR OF SCIENCE IN STATISTICS COMPUTING

BACHELOR OF SCIENCE IN APPLIED COMPUTING

BACHELOR OF SCIENCE IN PURE COMPUTING

SCO 300: COMPUTER NETWORKS

Date: 4/8/2016 **Time: 2:00 – 4:00 pm**

Instructions: Answer **question ONE and any other TWO questions**

QUESTION ONE (30 MARKS)

a) Define the following terms as used in computer networks:
   i) Bandwidth
   ii) User Account
   iii) Frame
   iv) Bottleneck (4 marks)

b) Discuss briefly Wide Area Networks and Local Area Networks under the following headings:
   i) Connectivity devices
   ii) Data transfer and error rates
   iii) Ownership (6 marks)

c) Differentiate between the following:
   i) Guided and unguided transmission media
   ii) CSMA/CD and Token passing access methods
   iii) Half duplex and Full duplex modes.
   iv) Synchronous and asynchronous transmission

v) Local User Account and Domain User Account

(10 marks)

d) (i)List two key fields of an IP address (2 marks)

(ii)Describe the key fields listed in d(i) (2 marks)

e) Distinguish between a network logical topology from the physical topology (2 marks)

f) List the four layers of the TCP/IP protocol suite (4 marks)

QUESTION TWO (20 MARKS)

a) i) State the functions of a network interface card (NIC)/adaptor card. (4 marks)

ii) Briefly explain three factors that will influence the choice of NIC for a particular computer. (6 marks)

b) Briefly explain the contents of a token ring frame (8 marks)

c) Explain the working of the following protocols as used in networking

(i) DNS

(ii) ARP (2 marks)

QUESTION THREE (20 MARKS)

a) As a network designer you will most likely use the following devices to enhance the performance of your network. Highlight the scenarios where you are likely to use the following devices bringing out clearly the differences between the operations of each. (8 marks)

i) Switch

ii) Router

iii) Gateway

iv) Repeater

b) Explain the factors that influence the choice of a network topology (5 marks)

c) Describe the three classes of IP addresses (6 marks)

d) Differentiate an Active hub from a Passive hub (1 mark)

QUESTION FOUR (20 MARKS)

a) Differentiate between the following

i) Parallel transmission and Serial transmission

ii) Modulation and Demodulation

iii) Peer to peer network and Server based network

iv) Broadband signaling and Baseband Signaling (8 marks)

b) With the aid of a sketch explain the operation of a hub-based network topology (3 marks)

c) Briefly list and explain the three types of unbounded data transfer technologies (3 marks)

d) Describe the functions of the last three layers of the OSI reference model (6 marks)

QUESTION FIVE (20 MARKS)

a) State three factors to put into consideration in selecting Cable type to be used in implementing a network (3 marks)

b) Show diagrammatically and explain the layers that specify IEEE 802 standards (4 marks)

c) With the aid of diagrams, explain the following transmissions
   i) Asynchronous
   ii) Synchronous (4 marks)

d) Explain three types of Access Methods (6 marks)

e) Explain three functions of protocols at the sending (source) computer (3 marks)