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

SECOND SEMESTER EXAMINATION FOR DEGREE IN BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY

SIT 201: DATA COMMUNICATIONS AND NETWORK

Date: 3/8/2016   **Time: 8:30 – 10:30 AM**

INSTRUCTIONS:

   ANSWER QUESTION ONE AND ANY OTHER TWO

QUESTION ONE (30 MARKS)

a) Briefly describe circuit switching.   (4 marks)

b) Explain how a packet-switched network works.   (4 marks)

c) Briefly discuss the main differences between TCP (Transmission Control Protocol) and
    UDP (User Datagram Protocol).   (8 marks)

d)   Discuss the main differences between Synchronous and Asynchronous Transmission,
    emphasising signal timing issues.   (4 marks)

e) Explain the functions of the following networking components and devices.   (5 marks)

   i.   Hub
   ii.   Gateways
   iii.   Routers
   iv.   Switches
   v.   Modem

f)   Explain the reasons why packet switching is commonly used in data networks. (3 marks)

g) What are the application areas of message switching? (2 marks)

QUESTION TWO (20 MARKS)

(a)   Local Area Networks (LANs) require an 'access method' which determines how computers share a common transmission medium. Write down the two main approaches for controlling this sharing in wired networks. Briefly explain how each approach operates.

(8 marks)

(b)   Three physical topologies associated with LANs are: the bus, ring and star topologies. Describe each one, highlighting their strengths and weaknesses from a reliability point of view.

(12 marks)

QUESTION THREE (20 MARKS)

(a)   Explain any two typical protocols in each of the following TCP/IP layers   (8 marks)

       (i)   Transport Layer

       (ii)   Network Layer
(b)   Explain four advantages of IPV6 over IPV4 (4 marks)
(c)   Name the advantages of fiber over twisted pair and coaxial cable (4 marks)
(d)   Compare and contrast Half and Full Duplex communication (4 marks)

QUESTION FOUR (20 MARKS

(a)   Define the following terms (4 marks)

       (i)   Delay

       (ii)   Jitter

       (iii)   Bandwidth

       (iv)   Throughput

(b)   Explain three services offered by the datalink layer (6 marks)

(c)   Explain any two types of collision Domains in Ethernets (6 marks)

(d)   Explain any virtual circuit switched communications works. (4 marks)

QUESTION FIVE (20 MARKS)

a)   Explain the following types of cables used in networking highlighting their
         advantages   (8 marks)

     i.   Twisted pair cable

     ii.   Coaxil cable

     iii. Fibre optics

b)   Distinguish peer to peer and client – server based as means of accessing network

                                                                                                                              (4 marks)

c)   Explain any FOUR considerations when choosing an ISP.   (8 marks)