



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 306: DATA COMMUNICATIONS AND NETWORK

Date: 3/8/2016

Time: 8:30 – 10:30 AM

INSTRUCTIONS

Answer Question One and Any Other Two Questions

QUESTION ONE (30 MARKS)

- (a) Draw the OSI model and state precisely the role of each layer (8 marks)
- (b) Describe the difference between circuit switching and packet switching. (4 marks)
- (c) Explain three differences between TCP and UDP. (3 marks)
- (d) Briefly describe the following items and give examples of each. (6 marks)
 - (i) Local Area Network(LAN)
 - (ii) Wide Area Network(WAN)
 - (iii) Metropolitan Area Network(MAN)
- (e) Explain four advantages of IPV6 over IPV4 (4 marks)

- (f) Briefly describe the following network devices and state the OSI layer in which they are found. (5 marks)

- (i) Router
- (ii) Switch
- (iii) Hub
- (iv) Repeater
- (v) Bridge

QUESTION TWO (30 MARKS)

- (a) Briefly describe TCP three-way hand shaking (3 marks)
- (b) Explain any four threats to the Machakos University network. Explain four counter measures to the threats. (8 marks)
- (c) List three services offered by the transport layer to the other layers (3 marks)
- (d) Briefly explain any THREE protocols found at the application layer (6 marks)

QUESTION THREE (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 FOUR (20 MARKS)

- (a) Explain any two typical protocols in each of the following TCP/IP layers (4 marks)
 - (i) Transport Layer
 - (ii) Network Layer

- (b) Explain the following data link flow control protocols. (6 marks)
- (i) Stop and wait
 - (ii) Fragmentation
 - (iii) Sliding window flow control
- (c) Name the advantage of fiber over twisted pair and coaxial cable (4 marks)
- (d) Describe the following network topologies. (6 marks)
- (i) Mesh topology
 - (ii) Bus topology
 - (iii) Star topology

QUESTION FIVE (20 MARKS)

- (a) Compare the following LAN technologies (5 marks)
- (i) Ethernet
 - (ii) 100 Base T
 - (iii) 10 Base T
 - (iv) 100 Base TX
 - (v) 10 Base 2
- (b) Explain the following Routing Algorithms (10 marks)
- (i) Non-hierarchical Routing
 - (ii) Hierarchical Routing
 - (iii) Source Routing
 - (iv) Policy based Routing
 - (v) Shortest Path routing
- (c) Explain the following ways of classifying cryptographic algorithms (5 marks)
- (i) Secret Key Cryptography (SCK)
 - (ii) Public Key Cryptography (PKC)
 - (iii) Hash Functions