



KENYATTA UNIVERSITY
UNIVERSITY EXAMINATIONS 2009/2010
INSTITUTE OF OPEN LEARNING

EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE

(INFORMATION TECHNOLOGY)

SIT 201: DATA COMMUNICATION AND NETWORKS

DATE: WEDNESDAY, 17TH FEBRUARY 2010

TIME: 8.00 A.M. - 10.00 A.M.

INSTRUCTIONS: Answer Question 1 and any other two Questions.

QUESTION 1 - (30 MARKS)

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|----|---|---|------|
| 1. | a | What is attenuation? | 2mks |
| | b | What does 100BASE-T specify? | 3mks |
| | c | Briefly describe how IP addresses are mapped to hardware | 4mks |
| | d | List any four (4) LAN standards | 4mks |
| | e | What is a communication protocol and why is it important | 2mks |
| | f | List any three (3) application layer protocols used in TCP | 3mks |
| | g | Briefly describe a peer-to-peer network giving its main disadvantage. | 3mks |
| | i | Briefly describe the function of a modem | 2mks |
| | h | List the four (4) categories of a physical network topology | 4mks |
| | i | List any three (3) features of a local area network | 3mks |

QUESTION 2 - (20 MARKS)

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|-----|--|--|-------|
| 2.a | With the aid of a diagram describe the functions of each layer of the OSI reference model. | | 16mks |
| 2b | With the aid of a diagram illustrate how the TCP/IP protocol maps onto the OSI reference model | | 4mks |

QUESTION 3 – (20 MARKS)

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|------|---|--|------|
| 3.a) | Describe the functions of a firewall in a network | | 3mks |
|------|---|--|------|

- 3.b) Briefly describe the function of a router hence distinguish between static and dynamic routing. Give two disadvantages of static routing over dynamic routing. 6mks
- 3.c) Describe the function of each of the following networking devices giving the relevant OSI protocol layer in each case 6mks
- i) Hub
 - ii) Bridge
 - iii) Switch
- 3.d) What is a communication satellite 5mks
- Distinguish between the following satellite orbits
- i) Geosynchronous
 - ii) Medium Earth orbit
 - iii) Low Earth Orbit

QUESTION 4 – (20 MARKS)

- 4.a) With the aid of a diagram give the formats of the four classes (A, B, C, D) of IP Addresses 8mks
- 4.b) Distinguish between the following elements of a communication protocol. 3mks
- i) Syntax
 - ii) Semantics
 - iii) Timing
- 4.c) What is a Subnet. With the aid of a diagram illustrate the format of a class B address in a network with subnets 3mks
- 4.d) Name the standard communication protocol used for each of the following tasks: 3mks
- sending data over the Internet
 - requesting and delivering web pages
 - requesting and delivering files
- 4.e) With reference to packet transmission on a network, distinguish between **Unicast**, **Broadcast** and **Multicast** 3mks

QUESTION 5 – (20 MARKS)

- 5.a) Define ISDN giving its application [11 Marks]
- With the aid of a diagram distinguish between basic rate interface (BRI) and primary rate interface (PRI).
- 5.b) Differentiate between the following networks 3mks
- i) Internet
 - ii) Intranet
 - iii) Extranet
- 5.c) With the aid of a diagram describe how a Virtual Private Network (VPN) operates 6mks