



## KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2016/2017

DIGITAL SCHOOL OF VIRTUAL AND OPEN LEARNING  
SECOND SEMESTER EXAMINATION FOR THE DEGREE OF  
BACHELOR OF INFORMATION TECHNOLOGY  
SIT 113: NETWORKINGDATE: Wednesday, 24<sup>th</sup> May 2017

TIME: 2.00 p.m. - 4.00 p.m.

INSTRUCTIONS:

ANSWER QUESTION ONE AND ANY OTHER TWO

## QUESTION ONE

- (a) Define NIC and briefly explain four functions of NIC. (5 marks)
- (b) Distinguish between dedicated and non-dedicated server. (2 marks)
- (c) Kenyatta University is one of the organizations that lead in network. It has ensured that all corner of the buildings are networked. Describe three advantages and two limitations that the university experience out of networking. (5 marks)
- (d) Define security and briefly discuss three basic dangers of security. (8 marks)
- (e) The OSI model has seven layers. Number of layers in any model is derived on principles. State five of those principles. (5 marks)
- (f) List different types of server and their purpose. (5 marks)
- (i) File server
  - (ii) Database server
  - (iii) Print server
  - (iv) DHCP server
  - (v) DNS server

### **QUESTION TWO (20 MARKS)**

- (a) Outline two types of network based on processing mode and two based on setup mode. (8 marks)
- (b) Compare twisted pair, coaxial cable, and fiber optic cable based on following factor.
- (i) Cost
  - (ii) Installation
  - (iii) Bandwidth capacity
  - (iv) Attenuation
- (12 marks)

### **QUESTION THREE (20 MARKS)**

- (a) Given the following IP address 192.168.1.0/25 calculate network address, hosts address and broadcast address. (6 marks)
- (b) Explain in detail how does the information flow from one host to another in OSI based system. (14 marks)

### **QUESTION FOUR (20 MARKS)**

- (a) With aid of a diagram illustrate three different types of physical topology stating an advantage and disadvantage. (15 marks)
- (b) State five roles of network administrator. (5 marks)

### **QUESTION FIVE (20 MARKS)**

- (a) Define Token passing and briefly explain three technologies used in token passing. (10 marks)
- (b) Using the table below state the right device that perform the under listed function. (10 marks)

<b>Statement</b>	<b>Device</b>
Used to connect only similar network architectures	
Used to regenerate weakened signals	
Allows to connect totally different network architectures	
Device that works only at physical layer of OSI	
Chooses the most economical path for data transmission	
Device capable of converting protocols	
Used to convert digital signals to analog and vice versa	
Used in a car network to connect different devices	
Uses routing table to find appropriate path	
Uses the greatest number of layer in OSI model	



KENYATTA UNIVERSITY  
UNIVERSITY EXAMINATIONS 2015/2016  
SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR  
OF SCIENCE IN INFORMATION TECHNOLOGY  
SIT 113: NETWORKING

DATE: FRIDAY 15<sup>TH</sup> APRIL 2016

TIME: 2.00 P.M. - 4.00 P.M.

INSTRUCTIONS

- Attempt question ONE and any other Two.
- Total Marks 70

Question 1

- a) With the help of a diagram, describe a client-server network architecture/model, indicating its components and the features of a server. (10 marks)
- b) Define the following terms in detail (10 marks)
- i) Network
  - ii) UDP
  - iii) DNS
  - iv) Multicast routing
  - v) Transmission control protocol
- c) You have just been appointed to the position of ABC Corporation's Senior Network Manager. Explain any five potential threats to the corporation's distributed system you would anticipate to encounter. How might you manage or mitigate them? (10 marks)

Question 2

A P C T N D P

- a) Describe any five benefits of OSI layering (10 marks)
- b) What is Ethernet CSMA/CD? How does this technology work? (10 marks)

### Question 3

(10 marks)

- a) Describe the following five TCP/IP Transport Layer Features

Function	Description
Multiplexing using ports	
Error recovery (reliability)	
Flow control using windowing	
Connection establishment and termination	
Ordered data transfer and data recovery	

- b) Networks are applied in many areas of the modern life. Briefly discuss any five uses of computer networks applicable in a University setup. (10 marks)

Input devices  
Resource  
Remote communication  
Communication  
Research

### Question 4

- a) Explain how any five Packet scheduling algorithms in wireline systems work (10 marks)
- b) Classify Networks by Component Roles, indicating one disadvantage of each. Support your answers with a diagram in each case. (10 marks)

### Question 5

- a) Differentiate between connection-oriented and connectionless communication, stating two examples of applicants suitable for each type of communication. (10 marks)
- b) Write short notes on the classifications of routing algorithms. (10 marks)

Global  
Decentralized  
- Static  
- Dynamic



KENYATTA UNIVERSITY  
UNIVERSITY EXAMINATIONS 2017/2018  
SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF  
SCIENCE IN INFORMATION TECHNOLOGY

STUDENT CENTRE KM  
[www.ku.ac.ke](http://www.ku.ac.ke) 0703520 .com

SIT 113: COMPUTER NETWORKS

TIME: 2.00p.m - 4.00p.m

DATE: Wednesday 29<sup>th</sup> August 2018

INSTRUCTIONS:

ATTEMPT QUESTION ONE AND ANY OTHER TWO QUESTIONS

QUESTION ONE

Kaka Ltd has its main office in London and branch offices in Nairobi, Kampala, Arusha and Harare. There is a plan to set up a computer network with four (4) computers and one server, which will contain confidential documents of Kaka Ltd, in the London office. All the branch offices connect local area networks with three computers each in each branch offices. There is expected growth of the company at Nairobi, Harare and Kampala branch offices. However the Arusha office has no signs of growth in the future. Assuming that you have been contracted to set up these network, and answer the following questions:

- a. With justifications, explain the type of a computer <sup>network</sup> that you would propose in main office and each of the branch offices. (5 marks)
- b. Using a well labeled diagram, show a design of the network in each office, link all the networks together and assign the required IP addresses to make these networks to communicate with each other, and configure each LAN for internet connection. (15 marks)
- c. State any three (3) types of WAN technologies that you can propose to be used in connecting the main office to the branch offices. (6 marks)

INVOLVEMENT IN ANY EXAMINATION IRREGULARITY SHALL LEAD TO DISCONTINUATION

Page 1 of 3

- d. Nairobi branch office may have a sub-branch office at Kisumu later after the network is setup. Very confidential data will be sent between Nairobi and Kisumu. With justifications, explain the kind of link that you would propose (4 marks)

### QUESTION TWO

- a. As you set up a computer network, you have a choice to use either a switch or a hub. Explain, with justifications, the device that you would use (4 marks)
- b. Using the OSI model, specify the devices that are related to each OSI layer model (6 marks)
- c. With an aid of a well labeled diagram showing broadcast and collision domains, differentiate between the following devices:
- i. Repeater and a bridge (4 marks)
  - ii. Switch and a hub (4 marks)
- d. Explain the functionalities of a gateway (2 marks)

### QUESTION THREE

- a. Differentiate the functionalities any four types of data backups (8 marks)
- b. John did a full back up on Monday and incremental backups on Tuesday and Wednesday. If data was lost on Thursday and had to be restored, which backups would be used for restoration? (4 marks)
- c. A full backup was done on Monday, and a differential backups for the rest of the week. What will the backup contain on Saturday? *on Tuesday* (4 marks)
- d. If a full backup was done on Monday, and an incremental and differential backups for the rest of the week. What will the backup contain on Saturday? *to restore data* (4 marks)

### QUESTION FOUR

- a. When troubleshooting a network, explain when you can use the following commands, and the results that you can obtain after using them:
- i. Ping (2 marks)
  - ii. Ipconfig (2 marks)
  - iii. Ipconfig/all (2 marks)
  - iv. Defragment (2 marks)
  - v. Disc cleanup (2 marks)



KENYATTA UNIVERSITY  
UNIVERSITY EXAMINATIONS 2007/2008  
INSTITUTE OF OPEN LEARNING  
EXAMINATION FOR THE DEGREE OF BACHELOR OF INFORMATION  
TECHNOLOGY  
SIT 113: NETWORKING

DATE: Wednesday 9<sup>th</sup> January, 2008

TIME: 8.00 a.m. – 10.00 a.m.

INSTRUCTIONS

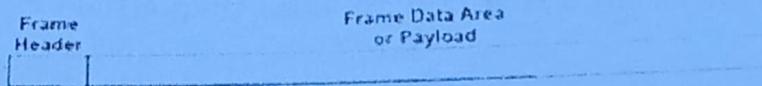
Answer any THREE questions. All questions carry equal marks.

Question 1 - (30 Marks)

- |  |      |
|--|------|
| 1.a) Give three reasons for networking   | 3mks |
| b) How does a Virtual Private Network (VPN) differs from an ordinary Internet connection | 2mks |
| c) Differentiate between hubs and switches   | 2mks |
| d) Briefly describe the following network security options                               | 2mks |
| i) Encryption  | 2mks |
| ii) Firewall   | 2mks |
| e) Briefly describe the benefits of wireless networking                                  | 3mks |
| f) Briefly explain the process that takes place when you send an email                   | 4mks |
| g) With the aid of a diagram describe the concept of multiplexing                        | 4mks |
| h) Distinguish between time division multiplexing and frequency division multiplexing    | 2mks |
| i) Briefly describe the function of a modem  | 2mks |
| j) List the three broad categories of network technologies                               | 3mks |
| k) List the key features of a local area network   | 3mks |

**Question 2 - (20 Marks)**

- 2.a) With the aid of a diagram distinguish between the Star, Ring and Bus topologies 6mks
- b) With reference to Bus topology explain the following 3mks  
i) Ethernet transmission. Illustrate with a diagram 3mks  
ii) CSMA/CD Media access scheme
- c) Describe the *Token Passing* process in a ring network 4mks
- d) What is the content of the *Header* and *Payload* in the conceptual frame format shown below? 2mks



**Question 3 – (20 Marks)**

- 3.a) With reference to packet transmission on a network, distinguish between *Unicast*, *Broadcast* and *Multicast* 3mks
- b) Briefly describe the function of each of the following network devices:  
i) Repeater 3mks  
ii) Bridge 3mks
- c) What is a switch and how does it differ from a hub and a bridge. 3mks
- d) Briefly describe the benefits of a Virtual Private Network 4mks
- e) With the aid of a diagram briefly describe the functions of all the layers of the OSI stack. 4mks

Question 4 – (20 Marks)

- 4.a) Distinguish between packet switching and circuit switching 2mks
- b) With reference to packet switching explain how TCP/IP protocol works 6mks
- c) Differentiate between *frame address* and *datagram destination address* and in each case indicate the routing function of the respective address. 4mks
- d) List two functions of a web browser 2mks
- e) Name the standard communication protocol used for each of the following tasks:  
i) sending data over the Internet  
ii) sending and receiving email  
iii) requesting and delivering web pages  
iv) requesting and delivering files 2mks
- f) Briefly describe the general format of a Uniform Resource Locator (URL) and illustrate with an example. 4mks

Question 5 – (20 Marks)

- 5.a) i) What is ISDN?  
ii) List the features of ISDN 1mk  
5mks
- b) Differentiate between basic rate interface (BRI) and primary rate interface (PRI) 4mks
- c) With the aid of a diagram differentiate between the following ISDN components:  
i) Terminal Equipment type 1 (TE1)  
ii) Terminal Equipment type 2 (TE2)  
iii) Terminal Adapter (TA) 6mks
- d) Distinguish between Intranet and Internet. What are the advantages of an intranet to an organization? 4mks



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**KENYATTA UNIVERSITY**  
**UNIVERSITY EXAMINATIONS 2015/2016**  
**SECOND SEMESTER EXAMINATION FOR THE DEGREE OF**  
**BACHELOR OF SCIENCE**  
**SCO 105: DATA COMMUNICATION TECHNOLOGIES**

**DATE:** Wednesday, 13<sup>th</sup> April 2016

**TIME:** 11.00 a.m. - 1.00 p.m.

**INSTRUCTIONS:**

*Answer question ONE and any TWO questions.*

**QUESTION ONE**

- (a) Define the following terms. (5 marks)
- (i) Computer network
  - (ii) Computer configuration
  - (iii) Simplex
  - (iv) ~~Network~~ Net interface card
  - (v) Switch
- (b) With aid of a suitable diagram explain the term composite signal. (4 marks)
- (c) Explain the three factors which determine how fast the data can be send through the channel depends on. (6 marks)
- (d) With reference to the OSI model explain the functions of the session layer. (5 marks)
- (e) Explain any three threats that a computer network can face. (6 marks)
- (f) Briefly explain any two types of controls that can be put in place to secure our computer network. (4 marks)

**QUESTION TWO**

Impala limited has five (5) branches spread across the city. Each branch needs to communicate to all other branches. Each branch has a number of computers distributed in various offices which handle different activities. As network expert you have been tasked with a task of developing a suitable network for the company. You have decided to develop a network that has an hydride topology.

- (a) (i) For effective communication between branches discuss the most suitable type of network topology would you suggest for the network design. (6 marks)
- (ii) For answer provided in (a) (i) above briefly discuss reasons that support your answer. (8 marks)

- (b) Performance of your network is an important criteria to consider so that the users can be attracted into using your network. Discuss any three factors that you will look at in order to improve the performance of your network. (6 marks)

### QUESTION THREE

Moi University requires a Network that will cater for their administrative and students needs. The users range from lecturers, administrative assistants and students. All types of users need to access the internet through the network. The university management also requires the network to support Wi-Fi access. The university members of staff need to access the university management information system, which should not be accessed by the students. The total number of expected users is 500 at any given time.

#### Required:

- (i) As a network expert which network topology would you use in the design of the network? (1 mark)
- (ii) Discuss two reasons that support your answer in (i) above. (4 marks)
- (iii) In your own opinion why do you think the management requested for inclusion of the Wi-Fi? (4 marks)
- (iv) Discuss any four security challenges that your network is mostly likely to face. (8 marks)
- (v) Discuss how you will secure your data and information against intruders and students who might attempt to access confidential information such as examinations? (3 marks)

### QUESTION FOUR

- (a) Describe Asynchronous Transfer Mode (ATM) technology. (6 marks)
- (b) Describe two protocols that operate at the TCP/IP Internet layer. (4 marks)
- (c) You have been given an assignment to design LAN for your organization. Discuss three issues that will make prefer to use switched Ethernet as opposed to traditional Ethernet. (6 marks)
- (d) List any four advantages of digital transmission over analog transmission. (4 marks)

### QUESTION FIVE

- (a) Describe the DSL technologies that are collectively referred to as xDSL. (8 marks)
- (b) Describe the access services offered by ISDN and their applications. (4 marks)
- (c) Distinguish between the following as applied to data networks.
  - (i) Transmission Control Protocol (TCP) and User Datagram Protocol (UDP)
  - (ii) Static routing and Dynamic routing(8 marks)



KENYATTA UNIVERSITY

COMPUTING AND INFORMATION TECHNOLOGY DEPARTMENT

SIT201 - DATA COMMUNICATION AND NETWORKING  
CAT ONE

27  
33  
24

Instruction: Answer all questions.

Exchange of data between two devices via some form of transmission medium

(a) Define the data communication and with aid of suitable diagram explain its basic components.

Sender  $\longrightarrow$  Medium implementation  $\longrightarrow$  Receiver  
Protocol

(b) Define the following terms:

- half duplex - transmission of data one at a time e.g. audio talker  
Full duplex - transmission of data in two directions simultaneously e.g. telephone  
Point-to-Point - communication between two nodes or endpoints  
Modulation - process carrying one or more properties of a periodic waveform  
frequency-division multiplexing - a technique for sending two or more signals over the same channel  
Quantizing error  $\rightarrow$  difference b/w an input value and its quantized value (5 marks)

(c) Explain the function of the following layers found in the Internet model:

- (i) Network layer  
(ii) Data link layer  
(iii) Transport layer (6 marks)

(d) If one was to design a circuit today, briefly explain any five reasons as why one would design a digital transmission circuit over analog transmission circuit. (5 marks)

(e) Using suitable diagrams explain the following:

- I. Unipolar scheme.  
II. Bipolar return to zero scheme (8 marks)

Notes

Application layer - provides service to user apps

Session layer - data representation

Transport layer - interhost communication checks point to point failure all data is retransmitted

Network layer - end-to-end connections

Link layer - address and link Path - carries the packets through the network

Media access control - physical interface - carrier sense multiple

Physical layer - Physical interface for transmission of information

**KENYATTA UNIVERSITY****UNIVERSITY EXAMINATIONS 2010/2011****FIRST SEMESTER EXAMINATION FOR THE DEGREE OF  
BACHELOR OF SCIENCE IN COMPUTER SCIENCE****Sco 105 ~~QUESTION~~: DATA COMMUNICATIONS TECHNOLOGIES****DATE: WEDNESDAY 30<sup>TH</sup> MARCH 2011****TIME: 2.00-4.00 P.M.****INSTRUCTIONS:****SECTION A: 30 MARKS**

- **Answer ALL Questions from this section.**

**Q1) a)** Explain Simplex, Full Duplex and half duplex modes of communication.

(6 marks) ✓

**b)** Discuss the main differences between Synchronous and Asynchronous Transmission, emphasizing signal timing issues. (4 marks)

**c)** Describe the main elements of the Local Area Network model. (3 marks)

**d)** Briefly describe circuit switching. ✗ (4 marks)

**e)** How does Local Area Network (LAN) differ from the Wide Area Network (WAN)? (2 marks)

f)

A network topology is either physical or logical. Clearly distinguish between the physical and the logical network topology. *(4 marks)*

g)

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

h)

Clearly distinguish between the extranets and intranets *(3 marks)*

## SECTION B

Answer any 2 questions from this section.

Q2)

a)

Using clearly labeled diagrams where possible discuss the 3 key wired network media commonly used citing their key advantages and disadvantages. *optical fiber, copper coaxial* *(10 marks)*

b)

Explain any five impairments experienced in transmission lines. *Attenuation, Impairments, noise*

*(10 marks)*

*(20 marks)*

Q3)

a) Briefly discuss the main differences between TCP and UDP. *(6 marks)*

b)

Explain the three key network topologies as found in most network highlighting their key advantages and disadvantages. *(9 marks)*

c)

Explain how data is transmitted in parallel and serial data transmission modes giving key differences in them. *(5 marks)*

*(20 marks)*

*Session -*

Pg 298

Q4

a) ✓ With the aid of a labeled reference model, explain the main functions of the layers of the OSI model. (9 marks)

b) Explain the following techniques as used in data communications giving examples of the technologies that apply the techniques below;

- i) Circuit Switching
- ii) Message switching
- iii) Packet switching

(10 marks)  
(20 marks)

a) TCP/IP is the most commonly used set of communication protocols over the internet. Illustrate the TCP/IP protocol suite and describe its operations in terms of layers giving the practical application of the model in data transmission in the internet. (10 marks)

b) Describe the following LAN topology technologies and show their key differences.

- i) FDDI ✓
- ii) CSMA/CD ✓

(6 marks)

c) Discuss at least 2 advantages and 2 disadvantages of the wireless networking. (4 marks)

ALL people say transport really dear physically

Application.  
Presentation.  
Session.  
Transport.  
Network.  
Data Link.  
Physical.

Answer all questions

- Differentiate between wired and wireless media 2 marks
- What are three advantages and three disadvantages of wireless media and wired media respectively 3 marks
3. Describe the optical fiber cable and its modes, and explain three advantages and disadvantages of using it. 4 marks
4. Describe the following communication technologies:
- Circuit switching
  - Packet switching
  - Message switching

~~System in which data is transmitted over stations on different lines~~

~~Dedicated circuit~~ 6 marks ~~in a network~~

~~Who Vertical private Network~~

Performance Checklist of MAT & WAN

Bridges

Routers

Gateways

Links

} layers

How a FDDI Link may can be made

AT differs from switched Ethernet in few ways  
despite that it is a switched network but any



KENYATTA UNIVERSITY  
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INSTITUTE OF OPEN LEARNING  
FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF  
SCIENCE  
SIT 201: DATA COMMUNICATION AND NETWORKING

Sco.105 | DATE: Thursday 10<sup>th</sup> January 2008

TIME: 10.30 a.m. - 12.30 p.m.

INSTRUCTIONS

- ✓ Answer QUESTION ONE and any other TWO questions
- ✓ Please start each question on a new page clearly indicating the question number and complete the question grid on your answer booklet

**QUESTION ONE (30 MARKS)**

- (a) Define the following terms: (5 marks)  
(i) parity bit  
(ii) MAN  
(iii) Protocol  
(iv) Simplex  
(v) Multiplexing
- (b) State and explain three basic hardware components that constitute a data communications. (6 marks)
- (c) State and explain two fundamental types of data that can flow through a circuit. (4 marks)
- (d) Briefly explain the client-server architecture. (5 marks)
- (e) State and explain any five (5) factors that one considers when selecting a media. (10 marks)

**QUESTION TWO (15 MARKS)**

- (a) With aid of suitable diagram describe the Internet model. (10 marks)
- (b) List any five applications that your institutions can use the Internet for. (5 marks).

**QUESTION THREE (15 MARKS)**

- (a) State and explain three major factors one can consider when choosing application architecture. (6 marks)

- (b) State and explain any three benefits of digit transmission over analog transmission. (6 marks)
- (c) With aid of suitable diagram explain the point-to-point configuration. (3 marks)

#### QUESTION FOUR (15 MARKS)

- (a) Explain the following:  
(i) guided media verses unguided media  
(ii) Parallel mode verses serial mode. (6 marks)
- (b) State and explain any three techniques of data modulation. (9 marks)

#### QUESTION FIVE (15 MARKS)

- (a) Briefly explain the following methods of accessing the media.  
(i) Polling  
(ii) Contention (6 marks)
- (b) Explain briefly the concept of packetizing as used in data transmission. (3 marks)
- (c) State and explain three fundamental approaches to routing. (6 marks)