



# **KIBABII UNIVERSITY COLLEGE**

**A CONSTITUENT COLLEGE OF**

**MASINDE MULIRO UNIVERSITY OF**

**SCIENCE AND TECHNOLOGY**

**UNIVERSITY EXAMINATIONS**

**2014/2015 ACADEMIC YEAR**

**THIRD YEAR SECOND SEMESTER**

**MAIN EXAMINATION**

**FOR THE DEGREE OF**

**BACHELOR OF SCIENCE COMPUTER SCIENCE**

**COURSE CODE: CSC 322**

**COURSE TITLE: COMPUTER NETWORKS**

**DATE: 8<sup>TH</sup> MAY, 2015      TIME: 8.00-10.00PM**

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## **INSTRUCTIONS TO CANDIDATES**

Answer Question One in Section A and Any other TWO (2) Questions in Section B

## SECTION A

Answer all questions in this section

### Question One [30 Marks]

- a) Explain the term “layering” as used in OSI model [1 Marks]
- b) Define the following terms: [5 Marks]
- i) Subnet
  - ii) Bandwidth
  - iii) Repeater
  - iv) Packet
  - v) Autonomous system in WAN
- c) Routers are critical devices in both LAN and WAN. State and explain three functions of a router in a network. [3 Marks]
- d) Differentiate between latency and congestion in packet switched networks: [2 Marks]
- e) State the role of ICMP and STCP protocols [2 Marks]
- f) Packet switching is preferred mode for data networks. [3 Marks]
- i. Explain what packet switching is
  - ii. State two advantages of packet switching over circuit switching
- g) State with examples any four services provided by communication network. In each service state the protocol it uses and its port number [4 Marks]
- h) Explain why the following are invalid IPv4 host addresses: [5 Marks]
- (a) 192.168.1.255
  - (b) 176.16.2.0
  - (c) 0.10.10.16.
  - (d) 255.9.56.45
  - (e) 127.0.0.2
- i) TCP and UDP are two protocols operating in transport layer of both OSI and TCP/IP. Discuss the two protocols clearly showing their differences [5 Marks]

## SECTION B

Answer any two questions in this section

### Question Two [20 Marks]

- a) i) Briefly explain the differences between WIMAX and WIFI [2 Marks]
- ii) Kibabii University College is planning to extend its local area network with the 802.11 WLAN. To implement this one must understand the 802.11 family. Discuss four flavors of 802.11 family showing clearly their distinct characteristics. [8 Marks]
- b) If you were employed as a Systems Administrator at Kibabii University College, state and explain five servers you would advice to be set up within the University’s LAN [5 Marks]
- c) HTTP is a protocol commonly used in internet. [5 Marks]
- i. State the role of this protocol and its port number
  - ii. State four protocols within this protocol

### Question Three [20 Marks]

- a) Assuming you are designing the local area network to be implemented in an organization. Discuss the factors you will consider before undertaking the exercise [5 Marks]

- b) You have been employed as Network Administrator in a university. The university currently has five thousand users of the network. You are planning to use private IPs behind a proxy server. **[5 Marks]**
- i. State with reason the IPv4 address class recommended for the network.
  - ii. Explain the role of a NAT device to be used in the network
  - iii. State sample private IPs to be used in the network
  - iv. Explain why you will need at least two public IPs
  - v. State two other functions of the proxy server
- c) Discuss the process of encapsulation in OSI model. **[10 Marks]**

**Question Four [20 Marks]**

- a) Apart from the IP address, name and explain two other parameters you set in a computer in order to connect to the internet **[2 Marks]**
- b) Differentiate between dial-up and broadband internet access. **[2 Marks]**
- c) TCP/IP is one of the main communication model used in internet today. Briefly discuss the layers of TCP/IP Model **[10 Marks]**
- d) Explain five ways a Network Administrator in a University can enhance security in a LAN. **[4 Marks]**

**Question Five [20 Marks]**

- a) Describe the following WAN technologies **[5 Marks]**
- i. ISDN
  - ii. X.25
  - iii. ATM
  - iv. FRAME RELAY
  - v. DSL
- b) The internet today is a complex network system. Discuss four key aspects that make it complex. **[8 Marks]**
- c) Briefly describe the seven layers of OSI model **[7 Marks]**