GARISSA UNIVERSITY COLLEGE

(A Constituent College of Moi University)

UNIVERSITY EXAMINATION 2016/2017 ACADEMIC YEAR ONE SECOND SEMESTER EXAMINATION

SUPPLEMENTARY/SPECIAL EXAMINATION

SCHOOL OF INFORMATION SCIENCE

FOR THE DIPLOMA INFORMATION TECHNOLOGY

COURSE CODE: DIT 022

COURSE TITLE: DATA COMMUNICATION AND NETWORKS II

EXAMINATION DURATION: 3 HOURS

DATE: 27/09/17 **TIME: 02.00-05.00 PM**

INSTRUCTION TO CANDIDATES

- **The examination has SIX (6) questions**
- **Question ONE (1) is COMPULSORY**
- **Choose any other THREE (3) questions from the remaining FIVE (5) questions**
- **Use sketch diagrams to illustrate your answer whenever necessary**
- **Do not carry mobile phones or any other written materials in examination room**
- **Do not write on this paper**

QUESTION ONE (COMPULSORY)

(a) Explain four benefits of computer networks to an organization **[4 marks]**

(b) What are the three IP number ranges provided for use in private network **[3 marks]**

(c) Differentiate between the following network devices

i. Switch and hub **[2 marks]**

ii. Firewall and IDS **[2 marks]**

iii. Router and B-router **[2 marks]**

(d) An airline seat reservation system is being designed in a new airport. One problem that existed in the old location is that some of fast computers on the network could monopolize the bandwidth, causing agents with slower computer to miss seating opportunities Recommend and explain network topology could you use that creates a far environment in which all computer have equal access to the available bandwidth **[4 marks]**

(e) The basic rate interface (BRI) is the service for homes and small businesses, while the primary rate interface (PRI) is the service for larger businesses. Compute the full capacity of the following service types.

i) BRI= 2B+D **[2 marks]**

ii) PRI=23B+D **[2 marks]**

iii) What are D and B channels **[2 marks]**

iv) Which one is equivalent to T1 circuit line? Explain **[2 marks]**

QUESTION TWO

(a) Hierarchical network design involves dividing the network into discrete layers. Explain any five considerations of hierarchical LAN design. **[5 marks]**

(b) Describe how the following devices are used in Data Communication Networks

i) DHCP server **[2 marks]**

ii) DNS server **[2 marks]**

iii) Proxy server **[2 marks]**

QUESTION THREE

(a) Discuss four roles of the network administrator in the organization **[6 marks]**

(b) Explain the following diagnostic techniques performed in network management **[6 marks]**

i. Ping

ii. telnet

iii. SSH

(c) Differentiate giving example between the passive and active network attacks **[3 Marks]**

QUESTION FOUR

(a) Discuss any four key tasks that must be performed by data communications system **[6 marks]**

(b) A switch is a device that allows a LAN to be segmented and operate under the same protocol.

i) State which OSI layer does a switch operate **[2 marks]**

ii) How does a switch gather signals from devices that are connected and regenerate a new copy **[3 marks]**

iii) Compare three methods used by switches to deal with data and recommend the best method giving reason(s). **[4 marks]**

QUESTION FIVE

(a) ABC enterprise currently employs eight people but plans to hire 10 more in the next four months. Users will work on multiple projects but one at time. Project manager should have access to all project files. You are instructed to setup the network to make it easy to manage and backup files. What type of LAN will you chose and why **[5 marks]**

(b) Given the following:

Network address: 192.168.10.0 and Subnet mask: 255.255.255.224

i. How many subnets **[2 marks]**

ii. How many hosts **[2 marks]**

iii. What are the valid subnets **[2 marks]**

(c) Explain the following telecommunication systems and internet popular technologies

i. ISDN **[2 marks]**

ii. SONET **[2 marks]**

QUESTION SIX

(a) Explain three factors that necessitate data transmission and networks capacity requirements in an organisation **[3 marks]**

(b) Discuss the following media access techniques

i. FDDI **[2 marks]**

ii. Demand priority **[2 marks]**

iii. Contentious technique **[2 marks]**

(c) Developing functional network infrastructures is a series of steps to be undertaken. Explain these steps **[6 marks]**