



JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY
SCHOOL OF INFORMATICS AND INNOVATIVE SYSTEMS
UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN
INFORMATION COMMUNICATION TECHNOLOGY
2ND YEAR 1ST SEMESTER 2016/ 2017 ACADEMIC YEAR
MAIN CAMPUS

COURSE CODE: IIT 3217

COURSE TITLE: NETWORK DESIGN AND IMPLEMENTATIONS

EXAM VENUE: MAIN CAMPUS

DATE: STREAM: Bsc ICT

TIME: 2 HOURS EXAM SESSION:

INSTRUCTIONS:

- 1. Answer question 1 in Section A (Compulsory) and any other two questions in Section B**
- 2. Candidates are advised not to write on the question paper**
- 3. Candidates must hand in their answer booklets to the invigilator while in the examination room**

QUESTION ONE (1) [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. Multiplexing
- c) 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) Explain why the following are invalid IPv4 host addresses **[2 Marks]**
- a. 192.168.1.255
 - b. 176.16.2.0
- f) Packet switching is preferred mode for data networks. **[3 Marks]**
- a. Explain what packet switching is
 - b. 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) With a suitable example explain 3 types of networking media, giving examples in each instance: **[5 Marks]**
- 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]**

QUESTION TWO [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 **[4 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 THREE [20 MARKS]

A2. This question is about protocol layers and the OSI Reference Model.

a. The OSI Reference Model defines seven protocol layers, each of which is responsible for a specific range of functions. By considering this model, explain the main functions performed by a protocol operating at:

- i. The Physical layer
- ii. The Data Link layer
- iii. The Application layer

[6 marks = 3 x 2 marks]

b. By considering either the computer or server, produce a diagram of the OSI Reference Model that clearly shows how data is transferred through the model's layers.

(10 Marks)

C. what is meant by frame relay

[4 marks]

QUESTION FOUR [20 MARKS]

a) When one part of the subnet (e.g. one or more routers in an area) becomes overloaded, congestion results, state and explain four factors that causes congestion. **[4 Marks]**

b) Traffic shaping controls the *rate* at which packets are sent, with a suitable example describe the token bucket mechanism for congestion control. **[10 marks]**

c) Explain briefly about quality of service. **[6 marks]**

QUESTION FIVE [20 MARKS]

a. With a suitable examples giving instances in each case, discuss the types of network. **[9 Marks]**

b. Explain any two types of Unguided Transmission Media. **[3 Marks]**

c. Define and explain the following routing protocols. **[8 Marks]**

- i. OSPF
- ii. RIP
- iii. BGP

iv. EIGRP