JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF INFORMATICS AND INNOVATIVE SYSTEMS

DEPARTMENT OF COMPUTER SCIENCE AND SOFTWARE ENGINEERING

UNIVERSITY EXAMINATION FOR THE DEGREE OF MASTER OF SCIENCE IN INFORMATION TECHNOLOGY SECURITY AND AUDIT

1ST YEAR 1ST SEMESTER 2018/2019 ACADEMIC YEAR

KISUMU CAMPUS

COURSE CODE: IIT 5113

COURSE TITLE: TCP/IP ARCHITECTURE AND ENTERPRISE NETWORK

EXAM VENUE: **STREAM: MSC**

DATE: 12TH AUGUST 2019 **EXAM SESSION: 2.00 – 5.00PM**

TIME: 3.00 HOURS

INSTRUCTIONS:

1. **Answer ANY three questions**
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 **[20 MARKS]**

(a) The popularity of the TCP/IP protocols did not grow rapidly just because the protocols were there, or because connecting to the Internet mandated their use. They met an important need (worldwide data communication) at the right time, and they had several important features that allowed them to meet this need. Describe these features that made TCP/IP protocol important. [8 Marks]

(b) Using suitable examples, compare and contrast IPv4 and IPv6. [6 Marks]

(c) There have been discussions of introducing IPv8, IPv10 and IPv12. In your own opinion, are these proposals justifiable, sustainable and technically logical? Discuss. [6 Marks]

QUESTION TWO **[20 MARKS]**

(a) RFCs (Request for Comments) that define official protocol standards are STDs and are given an STD number in addition to an RFC number. Creating an official Internet standard is a rigorous process. *Standards track* RFCs pass through three *maturity levels* before becoming standards. Use a specific example to explain this process. [6 Marks]

(b) Using suitable diagram in each case, compare and contrast OSI Reference Model and TCP/IP Architecture Model. [10 Marks]

(c) Explain the significance of *Unicast*, *Anycast*, *Broadcast* and *Multicast* in a network communication environment. [4 Marks]

QUESTION THREE **[20 MARKS]**

(a) "A network's routing configuration does not always require a routing protocol". Do you agree with this statement? Explain your answer. [4 Marks]

(b) Use an example to explain *The Minimum Routing Table*. Also provide an illustration that can be used in constructing a static routing table using **`route`** command. [8 Marks]

(c) Compare and contrast *Interior Routing Protocols* and *Exterior Routing Protocols* that applies on a communication network. [8 Marks]

(d)

QUESTION FOUR **[20 MARKS]**

(a) Discuss the practical implementation of *resolv.conf* and *named.conf* files in the servers of a Web Hosting company services. Include security considerations in the named implementations. [8 Marks]

(b) Using suitable examples, discuss *IP Subnetting* and *IP Supernetting* while implementing virtual LANs (VLANs) of a university network. Incorporate diagrams necessary in both cases. [8 Marks]

(c) Can private IP addresses be used to host e-mail services like for http//:mail.myhome.co.ke? Briefly explain your answer. [4 Marks]

QUESTION FIVE **[20 MARKS]**

(a) Describe the security implications in the use of the following in IP networks: [4 Marks]
   (i) Autonomous Numbers (ii) Border Gateway Protocol

(b) Using a suitable example, describe the implementation of the following network services needed in a financial company like a bank. Include specific files used. [16 marks]
   (i) Network File System (NFS)
   (ii) The Window File and Printer Services (SAMBA)
   (iii) The Internet Message Access Protocol (IMAP)
   (iv) The Line Printer Daemon (LPD) and the Line Printer (LP) Service