JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF INFORMATICS AND INNOVATIVE SYSTEMS

DEPARTMENT OF INFORMATION SYSTEMS

UNIVERSITY EXAMINATION FOR THE DEGREE BACHELOR OF INFORMATION COMMUNICATION AND TECHNOLOGY

YEAR THREE: SEMESTER ONE

2ND YEAR 2ND SEMESTER 2024/25 ACADEMIC YEAR

MAIN CAMPUS

COURSE CODE: ITB 1302

COURSE TITLE: NETWORK SYSTEM INTEGRATION AND MAINTENANCE

DATE: 24/4/2025 VENUE: LAB 12 SESSION: 9.00-11.00

TIME: 2HOURS

INSTRUCTIONS

1. **Answer Question 1 (Compulsory) and ANY other TWO 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**

Questions One (30 Marks)

a) Define **network systems integration** and explain its significance in modern IT environments. (4 Marks)

b) List and briefly describe **three key components** of a network architecture. (4 Marks)

c) What is the **OSI model**, and why is it important in network design? (4 Marks)

d) Explain the role of **LDAP directory servers** in identity management. (4 Marks)

e) Differentiate between **Network File System (NFS)** and **Network Information Services (NIS)**. (4 Marks)

f) Describe the **steps involved in network configuration implementation**, including addressing and security procedures. (6 Marks)

g) Explain the role of **Samba servers** in file and printer sharing within integrated network systems. (4 Marks)

Questions Two (20 Marks)

a) Identify and describe at least **three common network troubleshooting techniques**. (4Marks)

b) Discuss the impact of **network monitoring and management** on system performance. (4Marks)

c) Explain the importance of **physical layer protocols** in supporting communication across data networks. (8 Marks)

d) Describe **two security measures** used in securing networked systems. (4 Marks)

Questions Three (20 Marks)

Case Study:

An organization is upgrading its IT infrastructure and needs to integrate Windows, Linux, and MacOS systems. As a network administrator:

(a) Propose a suitable **network integration plan**, outlining key considerations. (5 Marks)

(b) Discuss the challenges of integrating different operating systems and how they can be mitigated. (8 Marks)

With the increasing use of **cloud-based solutions**, discuss the advantages and challenges of integrating cloud services into traditional network environments. (7 Marks)

Question Four **(20 Marks)**

Wireless Application Protocol specifications address some wireless issues by using the existing standards where possible, with or without modification, and also by developing new standards that are optimized for the wireless environment where needed.

(a) What is Wireless Application Protocol (WAP)? **(02 marks)**

(b) Explain the key elements of the WAP specification. **(08 marks)**

(c) In your opinion, why is WAP needed in wireless communication? **(10 marks)**

Question Five (20 Marks)

a) What is "system administration"? And describe the goals of system administration. **(4 marks).**
b) Describe some of the core possible duties of a systems administrator **(6 marks)**
c) There are various types of system administrators. Describe at least three types and explain their roles. **(4 marks)**
d) On a typical multiuser computing system (such as a shared Unix system at a university or an industry), various bad people can break into the systems or interrupt the normal operations of the system. Describe some of these people and as a systems administrator explain the various ways how you can guard your systems against these people **(6 marks).**