BINDURA UNIVERSITY OF SCIENCE EDUCATION

DEPARTMENT OF COMPUTER SCIENCE

BSc HONOURS INFORMATION TECHNOLOGY

NETWORK PLANNING AND DESIGN - IT201/NWE201

2 HOURS 30 MINUTES

INSTRUCTION TO CANDIDATES

Answer **all** questions.
Each question carries **20** marks. Total marks are **100.**

OCT 2024

Question 1

a. Explain the following design considerations at the network access layer of a hierarchical network design:

   i. Network topologies. **[4]**

   ii. Services at the network edge. **[4]**

   iii. Security. **[4]**

b. Describe <u>four</u> characteristics of the following categories of wireless connectivity technologies giving an example under each:

   i. Short range. **[4]**

   ii. Medium to long range. **[4]**

Question 2

a. Layer three switching technology can be used to improve network routing performance on large local area networks (LANs) like corporate intranets. Compare layer three switches to traditional routers. **[8]**

b. Putting together a medium to large communication network would require network designers to use a systematic approach to planning and designing the network. Explain the phases that the designer would need to go through in this approach. **[12]**

Question 3

a. Explain the design considerations at each of the following layers of a communication network:

i. Core [4]

ii. Distribution [4]

iii. Access [4]

b. Outline any **four** provisions that should be made to upgrade the IP address of an existing IPv4 network to IPv6. [8]

Question 4

a. Name and describe **two** QoS implementations in a network. [6]

b. Outline what needs to be included in a network design requirements document. [6]

c. Explain how you would test a WLAN design. [8]

Question 5

A company is moving to a new site and requires a local area network (LAN) at the site. The site is described as follows: The main building has one floor which will house all the three servers they need. Building has six offices each with one user who will require access for running networked applications, internet and IP telephony. The site has two other buildings which are separated by a distance of 50 metres from the main building. Each building house 10 users who require access to network applications, internet and IP telephony. These building will be linked to the network via wireless links. The company is connected to an ISP for internet. The company network also need to support mobile workers at most four who need access to the network from remote sites.

a. Analyse the requirements and produce a network diagram for the scenario. [15]

b. Suggest the security provisions for the network. [5]

****** END OF EXAM******