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**UNIVERSITY EXAMINATIONS
2022/2023 ACADEMIC YEAR**

**END OF SEMESTER EXAMINATIONS
YEAR FOUR SEMESTER TWO EXAMINATIONS**

**FOR THE DEGREE OF
BACHELOR OF SCIENCE COMPUTER SCIENCE**

COURSE CODE : CSC 477E
COURSE TITLE : NETWORK SECURITY

DATE: 09 /08/2023 TIME: 08:00 A.M – 10:00 A.M

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTIONS ONE AND ANY OTHER TWO.

QUESTION ONE**[COMPULSORY]****[30 MARKS]**

- a) Briefly detail three major components of an access matrix. [6 marks]
- b) i) Describe in detail four security threats that computer users face today. [8 marks]
ii) Explain four measures that can be taken to deal with these threats. [4 marks]
- c) i) Describe vulnerability in relation to computer security [2 marks]
ii) As a security expert, explain to a client what vulnerabilities exist to networking hardware and networking software computing resources. [6 marks]
- d) Compare and contrast wireless and fiber optic transmission in terms of security. [4 marks]

QUESTION TWO**[20 MARKS]**

- a. Computer networks are associated with various types of hardware. A modern home or office may include items of hardware. Give four such hardware. [2 marks]
- b. Explain what role each of these devices performs in a typical installation and why they are needed to provide safe networking facilities. [8 marks]
- c. Computers come under threat from a variety of sources. The software that can be used to harm or adversely affect the performance of a computer or to perform undesirable actions (e.g., identity theft) is called *malware*.
Describe the principal types of malware in existence today. Include the level of threat and the danger each form of malware presents. [6 marks]
- d. What are some of the best ways organizations and institutions can protect themselves from the above. [4 marks]

QUESTION THREE [20 MARKS]

- a. You have been invited to an audience of a middle level college students to give a talk on computer network threats, especially when data is on transit. Outline the major areas in which you will base your presentation giving examples of the major threats that exist.

[8 marks]

b. What are security controls? Give three classifications of controls [4 marks]

c. Discuss in details four controls that are used to safeguard a network. [8 marks]

QUESTION FOUR [20 MARKS]

a. As a computer security expert, you have been asked by Kibabii University to give them advice concerning their computing needs over the next five years. The University is considering whether to continue using conventional computers (at the moment they have several PC-based laboratories where most computers are 6 years old) and to upgrade the laboratories, or whether to change direction and use tablet-based computers (e.g., the iPad or tablets).

b. What advice would you give them? [10 marks]

c. With examples, differentiate between active and passive attacks. [4 marks]

d. Describe three computer system assets that are likely to be targeted by an attacker outside your organization. [6 marks]

QUESTION FIVE [20 MARKS]

a. As a network administrator, what are some of the motivations for you using or putting up honeypots? [4 marks]

b. Illustrate the major design considerations you will look at when choosing a transmission medium for a network you want to set up in a cyber café. [8 marks]

c. Networks can be classified using their component roles. Describe two classifications giving the security challenges they face and how to overcome them. [8 marks]