MASENO UNIVERSITY

UNIVERSITY EXAMINATIONS 2015/2016

FIRST YEAR SECOND SEMESTER EXAMINATIONS FOR THE DEGREE OF BACHELOR OF EDUCATION, GENDER STUDIES AND ENVIRONMENAL SCIENCE WITH INFORMATION TECHNOLOGY

MAIN CAMPUS

UCI 102: COMMUNICATION SYSTEMS

Date: 3rd May, 2016 Time: 8.30 - 10.30 am

INSTRUCTIONS:

- Answer ALL questions in SECTION A and any other TWO questions from SECTION B.

UCI 102: COMMUNICATION SYSTEMS

TIME: 2 H0URS

Instructions:

I. This paper contains **Five** questions in Section A and B

II. Question Section A is compulsory

III. Answer any other two questions from section B

SECTION A: COMPULSORY

QUESTION ONE

a) List the benefits of using TCP / IP over other networking protocols [5 Marks]

b) Explain the importance of adopting a formalized process to network design. [5 Marks]

c) Define analog and digital signals [2 Marks]

d) Explain the concept of IP addresses in detail [3 Marks]

e) Give the OSI layers in the correct order. [3 Marks]

f) Describe the following types of Computer network

i) WAN [3 Marks]

ii) MAN [3 Marks]

iii) LAN [3 Marks]

iv) PAN [3 Marks]

SECTION B: [ANSWER ANY TWO QUESTIONS]

QUESTION TWO

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 Application layer [3 Marks]
ii) The Physical layer [3 Marks]
iii) The Data Link layer [3 Marks]

b) Describe **FOUR** control methods we can employ to protect our communication systems from the various attacks. [7 Marks]

c) List **FOUR** common wireless transmission media [4 Marks]

QUESTION THREE

a) Identify **THREE** physical characteristics of fibre optic cables that make them more suitable for high speed digital data transmission than copper cables. [6 Marks]

b) Describe the characteristics of the following network topologies

i) Mesh topology [3 Marks]
ii) Bus topology [3 Marks]
iii) Ring topology [3 Marks]
iv) Ring topology [3 Marks]

c) Name any **TWO** data encoding/Conversion techniques [2 Marks]

QUESTION FOUR

a) Explain the difference between the following network devices;

i) Bridge [2 Marks]
ii) Router [2 Marks]
iii) Gateway [2 Marks]
iv) Switch [2 Marks]
v) Hub [2 Marks]

b) With illustration explain the following modes of data communication;

i) Simplex [3 Marks]
ii) Half Duplex [4 Marks]
iii) Full Duplex [3 Marks]

QUESTION FIVE

a) Highlight the use of the following in the TCP header;

i) Acknowledgement Number [2 Marks]

ii) Source port number [2 Marks]

iii) Flags [2 Marks]

iv) Reserved [2 Marks]

v) Checksum [2 Marks]

vi) Sequence number [2 Marks]

b) With illustration differentiate between serial and parallel types of data transmission methods [2 Marks]

c) XYZ Company intends to layout its network infrastructure and link up all its operations. You are required to list and describe all the necessary hardware and software required for this undertaking. [6 Marks]