UNIVERSITY OF FORT HARE

INTRODUCTION TO COMPUTER NETWORKS

SUPPLEMENTARY EXAMINATIONS

JANUARY

2019

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Time: 3 Hours

Subject: CSC 323

Marks: 100

This paper consists of 3 pages including the cover page

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INSTRUCTIONS

- This paper contains Four (4) questions, Answer all questions.
- Write neatly and clearly showing all workings for calculations.
- Number your answers correctly as indicated on each question.
- Read the question carefully before you attempt to answer.
- Full marks will be awarded to candidates who provide full answers, where necessary.

QUESTION ONE — 30 MARKS

a) Describe the physical characteristics of the following transmission media:
   i. Coaxial Cable. [2]
   ii. Optical Fiber Cable. [2]
   iii. Twisted pair Copper cable. [2]

b) Define the following terms:
   i. Transmission. [2]
   ii. Bandwidth. [2]

c) During transmission a signal can be modulated. Describe the three basic types of modulation listed below:
   i. Amplitude Modulation. [3]
   ii. Frequency Modulation. [3]
   iii. Phase modulation. [4]

d) Describe the functions of the following network equipment categories:
   i. Data Terminal Equipment (DTE). [2]
   ii. Data Circuit-terminating Equipment (DCE). [2]
   iii. Data Switching Equipment (DSE). [2]

e) Describe the differences between the following Ethernet LAN cables and specify when each cable is used:
   i. Cross-over cable. [2]
   ii. Straight-through cable. [2]

QUESTION TWO — 30 MARKS

a) Using well labelled diagrams, explain how information is sent from one host to another in a network with reference to the OSI model, highlighting the particular PDUs at each stage. [12]

b) Describe the concept of Variable-Length Subnet Mask (VLSM). [3]

c) Specify the classes to which the following networks belong to: [4]
   i. 191.69.77.2
   ii. 55.25.9.87
   iii. 195.33.66.9
   iv. 243.66.55.72

d) You have been allocated a class C network address of **211.1.1.0** and are using the default subnet mask of **255.255.255.0** how may hosts can you have? [2]

e) Subnet the Class C IP Address **195.1.1.0** So that you have **10 subnets** each with a maximum 12 hosts on each subnet. List the Address on host 1 on subnet **1,2 and 3.** [6]

f) Write the IP address **222.1.1.20** mask **255.255.255.192** in CIDR notation. [3]

QUESTION THREE — 20 MARKS

a) Explain the following concepts in network security:
   i. Vulnerability. [2]
   ii. Threat. [2]
   iii. Attack. [2]

b) Network vulnerabilities primarily occur in the following three categories, Explain each of the vulnerability categories:
   i. Technology. [3]
   ii. Configuration. [3]
   iii. Policy. [3]

c) Describe a SYN-Flood attack on a network. [5]

QUESTION FOUR — 20 MARKS

a) Write out the full names of the following Protocols:
   i. ICMP [1]
   ii. RARP [1]
   iii. IGMP [1]
b) Describe the function of the **Session Layer** of the OSI Model. [4]
c) Explain the following methods of multiplexing:
   i. Space Division Multiplexing. [2]
   ii. Frequency division Multiplexing. [2]
   iii. Time Division Multiplexing. [2]
d) Describe the technique of **Piggybacking.** [3]
e) Explain the functions of the following protocols:
   i. DHCP [2]
   ii. BGP [2]

TOTAL — 100 MARKS

If you do not change you soon become obsolete and eventually

EXTINCT!!!