



JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF INFORMATICS AND INNOVATIVE SYSTEMS

**UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR SCIENCE IN
SECURITY AND FORENICS**

2ndYEAR 1st APRIL 2016/2017 ACADEMIC YEAR

MAIN CAMPUS

COURSE CODE: IIT 3217

COURSE TITLE: NETWORK DESIGN AND IMPLEMENTATION

EXAM VENUE:
forensics

STREAM: B.Sc. Computer security and

DATE: APRIL 2017

EXAM SESSION:

TIME: 2.00 HOURS

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**

A) QUESTION 1 [30 MARKS]

- b) Why does fiber optic media have a significant security advantage over other transmission Media **(2marks)**
- c) What do you understand by the term subnetting? **(2 mark)**
- d) What do you understand by term convergence in relation to network design? **(2marks)**
- e) What do you understand by NAT, what are the two important functions it provides on a network **(3marks)**
- f) What is a demilitarized zone what essence does it serve in a network environment **(2mark)**
- g) What is a Non-routable address? **(2marks)**
- h) Explain what you understand by Automatic Private IP Addressing (APIPA) **(2 marks)**
- i) Why are WAN generally slower than LAN`s **(2mark)**
- j) You have been asked to install a network to give the network users the greatest amount of fault tolerance. Which network topology would you choose and why? **(2mark)**
- k) The IP address provides two pieces of information explain. **(2marks)**
- l) State threes reason why you would use DHCP over static addressing **(3 marks)**
- m) Convert the following into binary 234 and 1092 (do not use a calculator) **(4 marks)**
- n) What is the difference between connection oriented and connectionless protocol **(2marks)**

QUESTION 2 [20 MARKS]

- a) What is the 127.0.0.1 address used for? **(2marks)**
- b) What effect will an inappropriate DHCP server have on hosts using static IP addresses? **(2marks)**
- c) What predecessor to DHCP, on which DHCP is based, was used to assign a workstation its IP information and to supply it with a boot image? **(2marks)**

- d) What is the class c range of values for the first octet in decimal and in binary? **(2marks)**
- e) What is the valid range of values that may appear in an ipv4 octet? Give your answer in decimal as well as binary **(2marks)**
- f) What is the term for the auto-configuration technology responsible for addresses that start with 169.254? **(2marks)**
- g) What advantages are associated with network segmentation? **(4marks)**
- h) What is the primary function of a bridge? **(2marks)**
- i) What advantage does a switch have over a hub? **(2marks)**

QUESTION 3 [20 MARKS]

- a) State the several instances as to when a switch would be forced to broadcast **(5marks)**
- b) When a bridge is introduced in a network of a hub what happens to the collision domain using a diagram explain **(4 marks)**
- c) Explain why a switch is considered an intelligent device **(1marks)**
- d) You have a network of 48 computers connected to a central hub of late network has been terribly explain how you would go about to solve this problem with the aid of a diagram **(10 marks)**

QUESTION 4 [20 MARKS]

- a) Explain what you understand by the two these two secure network technologies **NAC** and **PAT** **(2marks)**
- b) Explain the effect on collision domain on following scenarios **(6marks)**
 - i. A bridge introduced between two hubs
 - ii. Two computers added on a hub network
 - iii. A network of a single hub with ten computers broken into two halves by introducing a second hub connected to the fist hub
- c) Distinguish between guided and unguided medium **(4marks)**
- d) Access Point is limited by a transmission range support your answer with at least two factors **(2marks)**

- e) Examine the diagram shown here. What is the most likely reason that user Spencer cannot communicate with user Evan? **(2mark)**



User: Evan
IP address: 192.168.1.121
Subnet mask: 255.255.255.0
Default gateway: 192.168.1.1



User: Spencer
IP address: 192.168.1.127
Subnet mask: 255.255.248.0
Default gateway: 192.168.1.1

- f) distinguish between public and private IP **(4marks)**

QUESTION 5 [20 MARKS]

- a) State and briefly explain at least 5 advantages associated with subnetting as a way of securing a network infrastructure **(5marks)**
- b) State at least six advantages associated with convergence **(6 marks)**
- c) Briefly explain at least 5 convergence vulnerabilities especially in relation to VOIP **(5 marks)**
- d) By the use of a diagram explain how Network Address Translation Works **(4marks)**