



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**

2nd YEAR 1st SEMESTER 2020/2021 ACADEMIC YEAR

SPECIAL/RESIT

MAIN CAMPUS

COURSE CODE: IIT 3217

COURSE TITLE: NETWORK DESIGN AND IMPLEMENTATION

EXAM VENUE:

STREAM:

DATE:

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**

QUESTION 1 [30 MARKS]

- a) Why are WAN generally slower than LAN's (1mark)
- b) Distinguish between the two wired network models (2marks)
- c) What do you understand by the term MPLS (1marks)
- d) 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? (1mark)
- e) Map the following Network devices to their OSI model Layers respectively (3marks)
 - i. **NIC:**
 - ii. **Access point (AP):**
 - iii. **Router:**
 - iv. **Switch:**
 - v. **Bridge:**
 - vi. **Hub**
- f) Sate two dynamic routing protocols used in Layer 3 of the OSI layer (2marks)
- g) What is the difference between connection oriented and connectionless protocol (2marks)
- h) When we say that UDP is a “fire and forget” protocol What does that mean (1mark)
- i) The IP address provides two pieces of information explain. (2marks)
- j) What is the range that Class C addresses span in the first octet? (1mark)
- k) Examine the diagram shown here. What is the most likely reason that user Spencer cannot communicate with user Evan? (1mark)

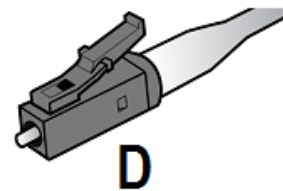
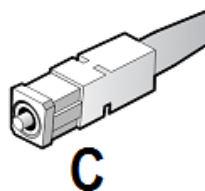
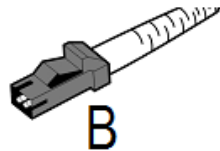
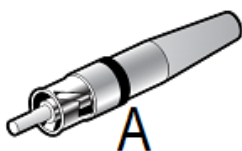


User: Evan
IP address: 192.168.1.121
Subnet mask: 255.255.255.0
Default gateway: 192.168.1.1



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

- l) You are the administrator for a network with two Windows Server systems and 65 Windows 7 systems. At 10 a.m., three users call to report that they are experiencing network connectivity problems. Upon investigation, you determine that the DHCP server has failed. How can you tell that the DHCP server failure is the cause of the connectivity problems experienced by the three users? (1mark)
- m) Explain what you understand by Automatic Private IP Addressing (APIPA) (2 marks)
- n) Explain One of the key advantages of PoE (1mark)
- o) Describe the essence of a proxy server within a network setting (2marks)
- p) What do you understand by latency (1mark)
- q) A variety of connectors are associated with fiber cabling state the following (2marks)



- r) Distinguish between a network policy and network procedure documentation (2marks)
- s) What TCP/IP command can be used to troubleshoot DNS problems? (1 mark)
- t) What importance do vulnerability scanners offer to a network (1mark)

QUESTION 2 [20 MARKS]

- a) What is topology, Distinguish between Physical Topology and logical topology (3marks)
- b) What's the distinction between MPLS and the traditional packet forwarding design? (4marks)
- c) You have been asked to connect two office locations. It has been specified that you use a wireless link. Briefly explain which strategy would you use to connect the two offices? (2marks)
- d) Explain what you understand by TCP/IP (2marks)
- e) What do you understand by term subnetting? (2marks)
- f) State the reasons for subnetting (4marks)
- g) As the network administrator, you decide to block port 80, 53, and 21. Which services will be unavailable for network users? (3marks)

QUESTION 3 [20 MARKS]

- a) Distinguish between public and private IP (2marks)
- b) State the address ranges for Class A, B, and C addresses with their respective subnet masks. (3marks)
- c) What do you understand by term Default Gateway? (2marks)
- d) Distinguish between unicast, broadcast, and multicast (6 marks)
- e) Distinguish between static and dynamic addressing (2marks)
- f) True or False: A load balancer must be a hardware device specially configured to balance the load. (1mark)
- g) State and explain two types of media interference can adversely affect data transmissions over a cabled network media (4marks)
- h) What is the difference between RJ-11 and RJ-45 connectors? (1mark)
- i) Distinguish the 568A and 568B Wiring Standards (2marks)

QUESTION 4 [20 MARKS]

- a) What do you understand by ad hoc and infrastructure wireless network topologies? (2marks)
- b) Briefly explain what you understand by the following acronyms in a wireless network (3marks)
 - i. Service Set Identifier (SSID)
 - ii. Basic Service Set (BSS)
 - iii. Extended Service Set (ESS)
- c) You are faced with a problem in which client systems cannot consistently access the AP, you could try moving the access point to better cover the area, but then you may disrupt access for users in other areas. Briefly explain at least five things that you can do to troubleshoot AP coverage? (5marks)
- d) Distinguish between Authentication, Authorization and Accountability aspects of network services security (3marks)
- e) What are the objectives of an enterprise in securing its network? (3marks)
- f) Briefly explain four critical functions Honeypot offers a network (4 marks)

QUESTION 5 [20 MARKS]

- a) Having a well documented network offers a number of advantages briefly explain at least three (3marks)

- b) Briefly state and explain the six common policies governing networks **(6marks)**
- c) Distinguish between a cold, warm and hot site **(3marks)**
- d) What are some of the services a firewall often provides? **(3marks)**
- e) What is the primary difference between an IDS and an IPS? **(2marks)**
- f) Define DMZ, for what purpose does it serve a network **(2marks)**
- g) You have enabled HTTPS because of concerns about the security of your web server application, which runs on a web server system in the DMZ of your corporate network. However, remote users are now unable to connect to the application. Which is the most likely reason for the problem? **(1mark)**