



**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 FORENSICS & ICT**

**2<sup>nd</sup> YEAR 1<sup>st</sup> SEMESTER 2018/2019 ACADEMIC YEAR**

**MAIN CAMPUS**

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**COURSE CODE: IIT 3217**

**COURSE TITLE: NETWORK DESIGN AND IMPLEMENTATION**

**EXAM VENUE:**

**STREAM: B.Sc. Computer security and  
forensics/ICT**

**DATE:**

**EXAM SESSION:**

**TIME: 2.00 HOURS**

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**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 ONE [30 MARKS]

- a) Identify the reasons why the networking industry uses a layered model (5marks)
- b) Define and describe the function of a MAC address (2marks)
- c) The OSI model is not an absolute standard for computer networks briefly explain what you understand by this statement (2marks)
- d) Briefly explain the major reason as to why The OSI model was developed as an industry standard (2marks)
- e) Within an analog network, devices that boost the signal are called amplifiers while within a digital network its referred to as a repeater, clearly explain how an amplifier is different from a repeater (2marks)
- f) What is network segmentation and why is it important to segment a network (2marks)
- g) Distinguish between centralized and distributed computing ( 2 marks)
- h) What do you understand by the term MAN ( 2marks)
- i) State and explain the two wireless topologies ( 2marks)
- 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? ( 2marks)
- k) Which topology enables network expansion with the least amount of disruption for the current network users state and explain? (2marks)
- l) You have been asked to connect two office locations. I t has been specified that you use a wireless link. Briefly explain which strategy would you use to connect the two offices? (2 marks)
- m) When TCP wants to open a connection with another host, it follows a procedure elaborate (3 marks)

### QUESTION TWO [20 MARKS]

- a) Identify and describe the functions of each of the seven layers of the OSI reference model (14marks)
- b) Briefly explain the Advantages associated with wireless mesh topology (4marks)
- c) Distinguish between broadcast, and multicast (2 marks)

### QUESTION THREE [20 MARKS]

- a) Explain the conversion steps of data encapsulation (10marks)
- b) Static addressing approach has two main problems explain (2marks)
- c) Explain what you understand by Automatic Private IP Addressing (APIPA)( 2 marks)
- d) Explain one of the key advantage of PoE. (2marks)
- e) What the potential drawback of a proxy server (2 marks)
- f) What are T-lines used for, and what is the maximum speed of T1 and T3? ( 2marks)

### QUESTION FOUR [20 MARKS]

- a) Explain what you understand by the following wireless terminologies. (4marks)
  - i. ad hoc mode
  - ii. infrastructure mode
  - iii. Basic Service Set (BSS)
  - iv. Extended Service Set (ESS)
- b) MPLS works with a variety of protocols name three. (3marks)
- c) Explain the advantages enterprise gain from using VPN links. (3marks)

### QUESTION FIVE [20 MARKS]

- a) Compare the attributes of the two wired network models (10 marks)
- b) What is the difference between circuit switching and packet switching? (2marks)
- c) What are the two most common connectors used with fiber-optic cabling? (2marks)
- d) Distinguish between baseband and broadband signaling method (2Marks)
- e) State and explain two types of media interference can adversely affect data transmissions over a cabled network media (2marks)
- f) Explain what you understand by the term Network policy (2marks)

