

# TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF MATHEMATICS & PHYSICS

**UNIVERSITY EXAMINATION FOR:**

**BACHELOR OF MATHEMATICS AND COMPUTER SCIENCE**

**EIT 4354: NETWORK DESIGN AND IMPLEMENTATION**

**END OF SEMESTER EXAMINATION**

**SERIES: APRIL 2016**

**TIME: 2 HOURS**

**DATE: Pick Date May 2016**

## Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **FIVE** questions. Attempt question ONE (Compulsory) and any other TWO questions.

**Do not write on the question paper.**

TECHNICAL UNIVERSITY OF MOMBASA  
Bachelor of Science in Mathematics & Computer Science  
EIT 4354 - Network Design & Implementation  
Exams – April Series 2016

### **Paper 1**

Instructions: Answer question one and any other two questions

#### Question One

- a) Explain the functions of the following devices as used in networking. (10 marks)
- i) Router
  - ii) Bridge
  - iii) Gateway
  - iv) Switch
  - v) Repeater
- b) A certain student in IT class was crimping a cross over cable in a computer lab. Copy and complete the table below for him. (8 marks)

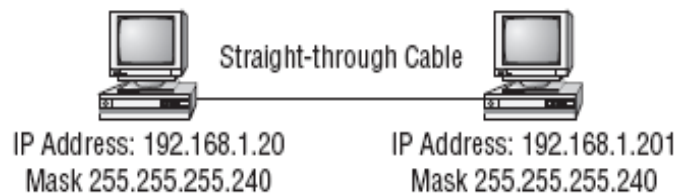
Pin	Connector A	Connector B
Pin 1	White green	
Pin 2		Orange
Pin 3		White green
Pin 4		

Pin 5		
Pin 6	Orange	
Pin 7	White Brown	White brown
Pin 8	Brown	Brown

- c) Highlight any four likely causes of a network connection failure. (4 marks)
- d) Differentiate between User Datagram protocols (UDP) and Transmission Control Protocol (TCP) protocols. (6 marks)
- e) Differentiate between IPv4 and IPv6. (2 marks)

### Question two

- a) Describe Open System Interconnection (OSI) reference model and explain its seven components layers with the aid of a diagram. (16 marks)
- b) A network administrator is connecting hosts A and B directly through their Ethernet interfaces, as shown below. Ping attempts between the hosts are unsuccessful. What can be done to provide connectivity between the hosts? (4 marks)



### Question three

- a) Differentiate between the following terms
- i) Logical and physical topology (4 marks)
  - ii) Latency and bandwidth (2 marks)
- b) Highlight four advantages of using wireless media over cable based media. (4 marks)
- c) Explain three goals of a network design. (6 marks)
- d) An institution is thinking of implementing a client/server model type of network category and not peer to peer model type of network category. Explain the difference of the two network categories. (4 marks)

### Question four

- a) A company is in the process of designing a computer network, knowing you as an expert in this area, they approach you to assist in designing. Describe how you will take them through a network design and implementation cycle. (12 marks)
- b) Highlight four advantages of fiber optics as a transmission media over the Unshielded Twisted Pair. (4 marks)
- c) State and explain any two transmission impairments. (4 marks)

### Question five

- a) A host has IP address 192.168.1.70/26. (8 marks)
- i) What is its subnet mask in decimal dotted notation?
  - ii) What is the network address of the second range?
  - iii) What is the broadcast address of the third range?
  - iv) What is the range of the valid IP addresses in the fourth range?

- d) Topologies associated with LANs are: the bus, ring and star topologies. Describe each one, highlighting their strengths and weaknesses from a reliability point of view. (12 marks)