



**KENYATTA UNIVERSITY**  
**UNIVERSITY EXAMINATIONS 2011/2012**

**SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF  
SCIENCE IN COMPUTER ENGINEERING**

**SCE 424: COMPUTER NETWORKS**

**DATE: TUESDAY, 10<sup>TH</sup> APRIL 2012**

**TIME: 11.00 A.M. – 1.00 P.M.**

**Instructions: Answer Question 1 and any other TWO.**

**QUESTION ONE**

- a. Define a Computer Network. [1 mark]
- b. Networks may be divided into different types and categories according to four different criteria. Discuss. [4 marks]
- c. Describe the following Hardware network components: [5 marks]
  - i. Network interface cards
  - ii. Bridges
  - iii. Routers
  - iv. Switches
  - v. Firewalls
- d. Discuss the following types of network media: [ 8 marks]
  - i. Copper wire
  - ii. Optical fiber
  - iii. Radio
  - iv. Infra-red
- e. With a diagrammatic illustration, explain the following types of modulation: [6 marks]
  - i. Amplitude modulation
  - ii. Frequency modulation
  - iii. Phase modulation
- f. Discuss the following OSI Physical Layer Standards: [ 6 marks]
  - i. RS-232
  - ii. CCITT X.21

## QUESTION TWO

- a. Define multiplexing. [2 marks]
- b. Describe the three basic multiplexing methods. [6 marks]
- c. Discuss the following network types: [6 marks]
  - i. Peer to Peer network
  - ii. Server based network
- d. Discuss the following protocol notations: [6 marks]
  - i. Sequence Diagrams
  - ii. State Transition Diagrams

## QUESTION THREE

- a. Differentiate between the following: [4 marks]
  - i. Simplex and Half- Duplex connections
  - ii. Synchronous and Asynchronous transmissions
- b. Selecting a transmission medium is guided by comparing transmission requirements against the medium's characteristics. Four important criteria influence the choice. Discuss. [4 marks]
- c. Describe the following OSI Data link protocols: [ 8 marks]
  - i. Synchronous Protocols
  - ii. Asynchronous Protocols
  - iii. Master-Slave Protocols
  - iv. Peer-to-Peer Protocols
- d. Explain how the following issues are addressed in the OSI network layer: [ 4 marks]
  - i. Congestion Control
  - ii. Error Handling

## QUESTION FOUR

- a. Define routing as it applies to data networks. [1 mark]
- b. Discuss the following classes of routing algorithms: [4 marks]
  - i. Static Routing
  - ii. Dynamic Routing

c. Discuss the following functions performed by OSI Data link layer protocols: [ 15 marks]

- i. Acknowledgments
- ii. Timers
- iii. Error Checking
- iv. Retransmission
- v. Flow Control

#### QUESTION FIVE

a. Discuss the following basic methods of switching: [6 marks]

- i. Circuit switching
- ii. Packet switching

b. Describe the following carrier access methods: [ 4 marks]

- i. Carrier sense
- ii. Token ring

c. With aid of a Diagram, describe the ISDN Functional Groupings and Reference Points. [ 4 marks]

d. Draw an ATM cell structure and describe each of the fields it contains. [6 marks]

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