



*(Knowledge for Development)*

**KIBABII UNIVERSITY**

**UNIVERSITY EXAMINATIONS  
2021/2022 ACADEMIC YEAR**

**END OF SEMESTER EXAMINATIONS  
YEAR FOUR SEMESTER ONE EXAMINATIONS**

**FOR THE DEGREE OF  
(COMPUTER SCIENCE)**

**COURSE CODE : CSC 470E**

**COURSE TITLE : NETWORK PROTOCOLS &  
STANDARDS**

**DATE: 16/05/2022**

**TIME: 02:00 P.M – 04:00 P.M.**

---

**INSTRUCTIONS TO CANDIDATES**

**ANSWER QUESTIONS ONE AND ANY OTHER TWO.**

## QUESTION ONE (COMPULSORY) [30 MARKS]

- a) Differentiate between the following as used in computer networks.
- i. Error Detection and Error Correction [2 marks]
  - ii. Flow control and Error control [2 marks]
  - iii. static and dynamic routing. [2 marks]
- b) What are the main causes of LAN traffic congestion? [5 marks]
- c) An IPv4 packet has arrived with the first 8 bits as shown: 01000010. The receiver discards the packet. Explain why? [4 marks]
- d) Find the class of each address.
- i. 00000001 00001011 00001011 11101111 [1 mark]
  - ii. 11000001 10000011 00011011 11111111 [1 mark]
  - iii. 14.23.120.8 [1 mark]
  - iv. 252.5.15.111 [1 mark]
- e) Kibabii University network administrator has chosen a possible subnet mask for his/her network and need to determine the number of subnets, number of valid hosts per subnet, valid subnets, broadcast address of each subnet, and valid hosts in each subnet. Calculate for each:
- i. A subnet mask 255.255.255.192 (/26) and network address 10.0.0.0 [6 marks]
  - ii. A subnet mask 255.255.255.192 (/20) and network address 172.16.0.0 [5 marks]

## QUESTION TWO [20 MARKS]

- a) Distinguish between the following terminologies as used in network protocols.
- i.) Static NAT and dynamic NAT [2 marks]
  - ii.) GMPLS and MPLS [2 marks]
- b) Explain how GMPLS Works? [7 marks]
- c) Discuss the functions of GMPLS control plane for all interfaces. [4 marks]
- d) Analyze the importance of GMPLS automated control plane over Carrier-Grade Ethernet. [5 marks]

### QUESTION THREE [20 MARKS]

- a) Define the following terms.
- i. Subnetting [2 marks]
  - ii. Supernetting [2 marks]
  - iii. Subnet Mask [2 marks]
  - iv. Protocol Multiplexing. [2 marks]
- b) Explain any five (5) important attributes of the Protocol Multiplexing mechanism. [5 marks]
- c) Discuss how the distance-vector routing protocols find the best path to a remote network by judging distance. [7 marks]

### QUESTION FOUR [20 MARKS]

- a) Differentiate between Network reliability and Quality of Service. [4 marks]
- b) Explain comparison of virtual-circuit and datagram networks. [5 marks]
- c) Explain Sliding Window Protocol in details. [6 marks]
- d) Explain the concept of File Transfer Protocol (FTP) and how it differs from other client/server applications. [5 marks]

### QUESTION FIVE [20 MARKS]

- a) Explain the followings.
- i. Flooding [2 marks]
  - ii. Distance Vector Routing [2 marks]
  - iii. The Count-to-Infinity Problem [2 marks]
- b) Compare and contrast between SMTP and HTTP application protocols. [6 marks]
- c) Discuss the various types of multiplexing. [4 marks]
- d) Explain the concept of SONET multiplexing. [4 marks]