



*(Knowledge for Development)*

## **KIBABII UNIVERSITY**

### **UNIVERSITY EXAMINATIONS 2021 / 2022 ACADEMIC YEAR**

### **SPECIAL / SUPPLEMENTARY EXAMINATIONS YEAR FOUR SEMESTER ONE EXAMINATIONS**

### **FOR THE DEGREE OF COMPUTER SCIENCE**

**COURSE CODE : CSC 470E**

**COURSE TITLE : NETWORK PROTOCOLS &  
STANDARDS**

**DATE: 14/11/2022                      TIME: 02.: 00 P.M – 04:00 P.M.**

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#### **INSTRUCTIONS TO CANDIDATES**

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

**QUESTION ONE (COMPULSORY) [30 MARKS]**

- a) Networking standards can be classified as *proprietary*, *open*, *de jure* or *de facto*. Distinguish between these FOUR types of standards. [4 marks]
- b) There are a number of well-known international organizations that play an important role in the development of open networking standards. Identify any SIX oversight organizations, responsible for overall management of the standards development process, rather than for the particulars of creating individual standards. [3 marks]
- c) Networking industry groups differ in a few ways from standards organizations. Explain how they differ. [5 marks]
- d) State the functions of IEEE 802.11 working group and the Wireless Ethernet Compatibility Alliance (WECA). [2 marks]
- e) With aid of a diagram demonstrate how the TCP/IP model spans the layers of the OSI reference model. [5 marks]
- f) You are setting up a workstation for remote access to the office. The office has a modem pool configured, and it is working correctly. The required results are that the workstation and modem bank must establish a connection and that the server at the office must authenticate the workstation. Optionally, the workstation and office must be able to communicate by using a single protocol, and the workstation must be able to access all network devices at the office. The proposed solution is to install a POTS telephone line, modem cable, and modem connected to the workstation. How would you configure the protocols to achieve the desired results? [3 marks]
- g) As a network design assistant, you have chosen a possible subnet mask for your 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 each of the listed questions given:
- i. A subnet mask 255.255.255.128 (/25) and network address 192.168.10.0 [4 marks]
  - ii. A subnet mask 255.255.255.192 (/20) and network address 172.16.0.0 [4 marks]



## QUESTION TWO [20 MARKS]

- a) Distinguish between IPv4 and IPv6 IP terminologies. [2 marks]
- b) While the need to standardize protocols seems obvious, there are a couple of other aspects to Internet standardization that are equally important but perhaps not quite as well understood state and explain these aspects [5 marks]
- c) Explain the role of regional Internet registries (RIRs) [2 marks]
- d) Discuss how the ICMP Router-Discovery Protocol (IDRP) works to discover the addresses of routers on directly attached subnets. [6 marks]
- e) Identify and explain any five (5) application-layer protocols that utilizes User Datagram Protocol (UDP), a Layer 4 connectionless transport-layer protocol in the Internet protocol family. [5 marks]

## QUESTION THREE [20 MARKS]

- a) The hierarchal or layered approach to networking produces what is known as a layered architecture. This is in contrast to the "flat" or "horizontal" approach. Discuss any FOUR benefits to layering networking protocol. [5 marks]
- b) While TCP/IP is not the only internetworking protocol suite, it is definitely the most important one. Outline SIX factors that have resulted to the unparalleled success TCP/IP. [6 marks]
- c) As a network designer why is it important to advice your client to implement VLANs? [6 marks]
- d) Identify three ways that using routers in your network can reduce congestion. [3 marks]

## QUESTION FOUR [20 MARKS]

- a) With regards to network standards and protocols explain the meaning of a requests for comments (RFCs) document [4 marks]
- b) There are different types of RFCs. Each RFC has a *category* or *status* associated with it that indicates its disposition: Describe FOUR categories of RFCs [8 marks]
- c) Describe the four basic functions of GMPLS control plane for both packet-switched interfaces and non-packet-switched interfaces. [8 marks]

**QUESTION FIVE [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) A SIP session constitutes of SIX basic message types known as methods. Identify and state the purpose of these methods [8 marks]
- c) H.323, invented by ITU, defines FOUR elements comprising a signaling system. State these elements. [4 marks]

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