



MACHAKOS UNIVERSITY

University Examinations for 2019/2020 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

FOURTH YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE (COMPUTER SCIENCE)

BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY)

SCO 403: NETWORK APPLICATIONS

DATE: 20/1/2021

TIME: 8:30 – 10:30 AM

INSTRUCTIONS

- i) Answer question ONE and any other TWO questions**
- ii) Write on both sides of the answer sheet**
- iii) Begin each new answer on a separate page of the answer sheet**

QUESTION ONE (COMPULSORY(30 MARKS))

Choose the correct answer and provide a brief explanation for your choice

- a) What is the advantage of using SSH over Telnet? (3 marks)
 - i) SSH is easier to use.
 - ii) SSH operates faster than Telnet.
 - iii) SSH provides secure communications to access hosts.
 - iv) SSH supports authentication for a connection request.
- b) A network engineer is analyzing reports from a recently performed network baseline. Which situation would depict a possible latency issue? (3 marks)
 - i) a change in the bandwidth according to the show interfaces output
 - ii) a next-hop timeout from a traceroute
 - iii) an increase in host-to-host ping response times
 - iv) a change in the amount of RAM according to the show version output

- c) A user reports a lack of network connectivity. The technician takes control of the user machine and attempts to ping other computers on the network and these pings fail. The technician pings the default gateway and that also fails. What can be determined for sure by the results of these tests? (3 marks)
- i) The NIC in the PC is bad.
 - ii) The TCP/IP protocol is not enabled.
 - iii) The router that is attached to the same network as the workstation is down.
 - iv) Nothing can be determined for sure at this point.
- d) Which protocol is used by a client to communicate securely with a web server? (3 marks)
- i) SMTP
 - ii) SMB
 - iii) IMAP
 - iv) HTTPS
- e) Which applications or services allow hosts to act as client and server at the same time? (3 marks)
- i) client/server applications
 - ii) email applications
 - iii) P2P applications
 - iv) authentication services
- f) What is an example of network communication that uses the client-server model? (3 marks)
- i) A user uses eMule to download a file that is shared by a friend after the file location is determined.
 - ii) A workstation initiates an ARP to find the MAC address of a receiving host.
 - iii) A user prints a document by using a printer that is attached to a workstation of a coworker.
 - iv) A workstation initiates a DNS request when the user types www.cisco.com in the address bar of a web browser.
- g) Which layer in the TCP/IP model is used for formatting, compressing, and encrypting data? (3 marks)
- i) internetwork
 - ii) session
 - iii) presentation
 - iv) application
 - v) network access

- h) What information is used by TCP to reassemble and reorder received segments? (3 marks)
- i) port numbers
 - ii) sequence numbers
 - iii) acknowledgment numbers
 - iv) fragment numbers
- i) Which action is performed by a client when establishing communication with a server via the use of UDP at the transport layer? (3 marks)
- i) The client sets the window size for the session.
 - ii) The client sends an ISN to the server to start the 3-way handshake.
 - iii) The client randomly selects a source port number.
 - iv) The client sends a synchronization segment to begin the session.
- j) Which transport layer feature is used to guarantee session establishment? (3 marks)
- i) UDP ACK flag
 - ii) TCP 3-way handshake
 - iii) UDP sequence number
 - iv) TCP port number

QUESTION TWO (20 MARKS)

- a) Analyse how a Remote Procedure Call (RPC) allows clients to call procedures in servers running on remote hosts (8 marks)
- b) Compare and contrast between the following pairs:
- i) Marshalling and Un-Marshalling processes in RPC (6 marks)
 - ii) Conventional and Asynchronous RPC (6 marks)

QUESTION THREE (20 MARKS)

- a) Compare a Web site to a Web service (2 marks)
- b) List down any 5 Search engines according to the year when they were first launched (5 marks)
- c) Briefly analyse the architecture of a search engine (8 marks)
- d) Provide a critical analysis of the characteristics of Web services (5 marks)

QUESTION FOUR (20 MARKS)

- a) Explain the following terms:
 - i) MiddleWare (2 marks)
 - ii) Remote Procedure Calls(RPC) (2 marks)
 - iii) Database Driven Website (2 marks)
 - iv) Cloud computing (2 marks)
 - v) Hardware Virtualization (2 marks)
- b) Provide a critical analysis of e-mail systems (10 marks)

QUESTION FIVE (20 MARKS)

- a) Name any THREE examples for each of the following
 - i) Application Programming Interfaces(APIs) (3 marks)
 - ii) MiddleWare (3 marks)
 - iii) Database Driven Websites (3 marks)
- b) Distinguish between Dynamic Websites and Static Websites (4 marks)
- c) What are the risks associated with cloud computing? Explain (6 marks)
- d) Explain the Advantages of a Database-Driven Website (6 marks)