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University of Swaziland
Faculty of Science and Engineering
Department of Electrical and Electronic Engineering
Supplementary Examination 2016

Title of Paper : Computer Networks

Course Number : EE572

Time Allowed : 3 hrs

Instructions :

    1. Answer all four (4) questions
    2. Each question carries 25 marks

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The paper consists of three (3) pages

Question 1

(a) Packet switching is used in layer 3; state the difference between the two approaches that are used, virtual circuit and datagram approach? [6]

(b) What are the differences between message confidentiality and message integrity? [6]

(c) The OSI model is the standard model for communication in the ICT era. Draw the model and significantly explain what takes place at each layer (functions of each OSI layer)? [9]

(d) In open-loop congestion control, policies are applied to prevent congestion before it happens. State four (4) policies that can be implemented? [4]

Question 2

(a) Using the error control techniques, differentiate between Go-Back-N ARQ and Selective Repeat ARQ? [6]

(b) What is the main difference between TCP and UDP? [1]

(c) What is the difference between the basic rate ISDN (BRI) and Primary rate ISDN (PRI) [4]

(d) Your company has been just assigned the network 192.168.10.0/27. How many subnets (IP range) and hosts-per-subnet you can create with a subnet mask of 255.255.255.252? [6]

(e) Explain how reservation and token passing works as part of the controlled access techniques. In token passing, explain how is the right to access the channel passed from one station to another? [8]

Question 3

(a) In wireless LANs collision is avoided by the use of the network allocation vector (NAV). Explain how that works in wireless LANs. [3]

(b) Discuss these two application layer protocols: SMTP and FTP. Clearly state their purpose, ports used, etc. [10]

(c) Two processes in client-server model can interact in various ways. Explain how a socket works in this model. [5]

(d) Explain the three way handshaking in the transport layer. [4]

(e) Create an extended access-list to deny FTP access from network 200.200.10.0 to network 200.199.11.0 but allow everything else. [3]

Question 4

(a) Explain two node instability problem in distance vector routing algorithms and state how it can be resolved. [5]

(b) In mobile IP, how do agents discovery takes place [3]

(c) Explain the difference between error correction and error detection. Which approach requires more information? [5]

(d) Using the persistence methods explain how a non-persistent station differs from a p-persistent station? [5]

(e) Distinguish between unicast, broadcast, and multicast. [5]

(f) In the standard Ethernet with the transmission rate of 10 Mbps, we assume that the length of the medium is 2500 m and the size of the frame is 512 bits. The propagation speed of a signal in a cable is normally $2x\ 10^8$ m/s. Calculate the efficiency? [2]