RAJARATA UNIVERSITY OF SRI LANKA
FACULTY OF APPLIED SCIENCES
B.Sc. (Information and Communication Technology) Degree
Fourth Year Semester I Examination October / November 2015

ICT4303 – ADVANCED COMPUTER NETWORKS

Answer **any five (05)** questions Time: **3 hours**

01 a. Briefly explain how dividing IPv4 address space into different classes waste IP addresses and how classless addressing eliminates that problem.

(05 Marks)

b. ***"Private IP address ranges defined in RFC 1918 can only be used in local area networks".*** Discuss three mechanisms that can be used to connect a local area network using private IP addresses to the Internet so that computers in the local area network can browse the World Wide Web.

(10 Marks)

c. ***"Dynamic Host Configuration Protocol (DHCP) significantly eases up network configuration tasks".*** What are the other advantages of using DHCP? Give examples to elaborate your answer.

(05 Marks)

02 a. ***"Circuit switching wastes the channel capacity".*** Do you agree with this statement? Why or why not?

(05 Marks)

b. ***"In packet-switched networks a significant overhead and a considerable delay is inevitable".*** Discuss the causes for overhead and delay in packet-switched networks.

(05 Marks)

c. ***"Virtual circuit switching reduces delay in packet transition".*** Elaborate the process of establishing a virtual circuit.

(05 Marks)

d. What are the advantages of datagram switching? Briefly discuss each of the stated advantages.

(05 Marks)

03. a. ***"Random routing algorithms have the robustness and simplicity of flooding".*** Compare and contrast random routing with flooding.

(05 Marks)

b. Briefly discuss the advantages of distributed routing over centralized routing.

(05 Marks)

c. ***"Adaptive routing algorithms have the drawback of reacting to topology or load changes too quickly or too slowly".*** Discuss this statement.

(10 Marks)

04. a. State and explain the ***optimality principle*** of routing and explain what a ***sink tree*** is.

(05 Marks)

b. Discuss the ***Dijkstra's Algorithm*** of finding the least-cost route.

(10 Marks)

c. ***"Distance vector routing is vulnerable to count-to-infinity problem".*** Explain the count-to-infinity problem.

(05 Marks)

05. a. Briefly explain the principle of ***tunneling***.

(05 Marks)

b. ***"High-level Data Link Control (HDLC) Protocol defines three modes of data transfer".*** Discuss the three data transfer modes supported by HDLC.

(05 Marks)

c. Discuss the connection setup and teardown processes in ***Point-to-Point Protocol (PPP)***.

(05 Marks)

d. Explain the operation of ***Point-to-Point Tunneling Protocol (PPTP)*** and its uses.

(05 Marks)

06. a. Compare and contrast ***Basic Rate Interface (BRI)*** and ***Primary Rate Interface (PRI)*** services of ***Integrated Services Digital Network (ISDN)***.

(05 Marks)

b. Discuss the features of ***Dial on-Demand Routing (DDR)*** services.

(05 Marks)

c. ***"Frame Relay service performs multiplexing and routing at the link layer".*** Discuss the operation of Frame Relay service.

(05 Marks)

d. Elaborate the use of ***Committed Information Rate (CIR)*** parameter for congestion controlling in Frame Relay networks.

(05 Marks)

07 a. Discuss the use of ***Simple Network Management Protocol (SNMP)*** in network management.

(05 Marks)

b. Briefly discuss the ***five conceptual areas*** of ***OSI Network Management Model***.

(10 Marks)

c. Briefly explain the function of ***three (03) protocols*** used by ***Secure Shell (SSH)***.

(05 Marks)

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