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RAJARATA UNIVERSITY OF SRI LANKA
FACULTY OF APPLIED SCIENCES

B.Sc. 4 Year Degree in Applied Sciences
Fourth Year - Semester I Examination – Oct / Nov 2017

ICT4303 – ADVANCED COMPUTER NETWORKS

Time: Three (03) hours

Answer any five (05) questions

1. Question 01 **(20 marks)**

   a) Briefly describe how the CIDR (Classless Inter-Domain Routing) provides the maximum utilization of available IPv4 addresses. Use an appropriate example in your discussion. **(05 Marks)**

   b) What services do TCP provide on top of the base services provided by IP? Name two applications which use TCP. **(05 Marks)**

   c) A small company has obtained an Internet connection with an IPv4 address range of 192.248.94.64/29. The company has 5 departments, and some internal servers, which will use private IP addresses. Each department and the servers will have its own network, connected by a L3 switch. The company runs web, email and proxy servers, which should be externally accessible. Design a network configuration for the company, and show the IP address assignments for each departmental network and the internal and public servers.

   (10 Marks)

2. Question 02 **(20 Marks)**

a) Briefly describe the circuit switched networks and packet switched networks. How do the circuit switched networks and packet switched networks handle multiplexing?

(10 Marks)

b) What are roles of DTE (Data Terminal Equipment) and DCE (Data Communications Equipment) in WAN technologies? Briefly describe. (05 Marks)

c) Briefly comment on **one** of the following WAN technologies:

   i. DSL

   ii. ATM

   iii. Frame Relay (05 Marks)

3. Question 03 **(20 Marks)**

a) Explain the Dijkstra's algorithm for finding the least cost route using an example topology. (10 Marks)

b) Briefly describe static routing and dynamic routing. (05 Marks)

c) Discuss how RIP (Routing Information Protocol) and OSPF (Open Shortest Path First) protocols work. (05 Marks)

4. Question 04 **(20 Marks)**

a) Briefly describe how VPN (Virtual Private Networks) work and how VPN provide security? (08 Marks)

b) Compare and contrast Password Authentication Protocol (PAP) and Challenge-Handshake Authentication Protocol (CHAP). (04 Marks)

c) Briefly describe PPPoE (Point-to-Point Protocol over Ethernet) protocol.

(04 Marks)

d) Compare to traditional routing what concerns are there in mobile routing?

(04 Marks)

5. Question 05 **(20 Marks)**

   a) What is network monitoring and maintenance in network management? Briefly describe. (05 Marks)

   b) Briefly describe the major functions in network management. (10 Marks)

   c) What is SDN (Software Defined Networks)? (05 Marks)

6. Question 06 **(20 Marks)**

   a) Briefly explain the process Connection Establishment, Data Transfer and Connection Termination in TCP connection-oriented data transmission with a suitable example.

   (10 Marks)

   b) Compare and contrast single mode optical fibres with multimode optical fibres in relation to their data communication capabilities. (06 Marks)

   c) What are the similarities and differences in a Layer 3 Switch and a Router?

   (04 Marks)

   -End of question paper -