THE OPEN UNIVERSITY OF SRI LANKA
B.Sc. DEGREE PROGRAMME: LEVEL 05
NO BOOK TEST 2 - 2016/2017
CPU3245 – COMPUTER NETWORKS AND SECURITY
**DURATION: One and a Half hours**

Date: 27/10/2017	Time: 4.00pm – 5.30pm

Answer All Questions

QUESTION 1

1.1) Explain the strategies of open loop and closed loop in congestion control in computer networks. (Use maximum of 5 sentences per each strategy)

1.2) You need to subnet an IP block to a six sub networks (areas) as indicated in the following diagram. Stating all the assumptions you make, divide the IP block (161.30.0.0/21) to proper subnets and give the following information for each subnet. Show your calculations.

      i) Network address with subnet mask
   ii) Broadcast address of the subnet
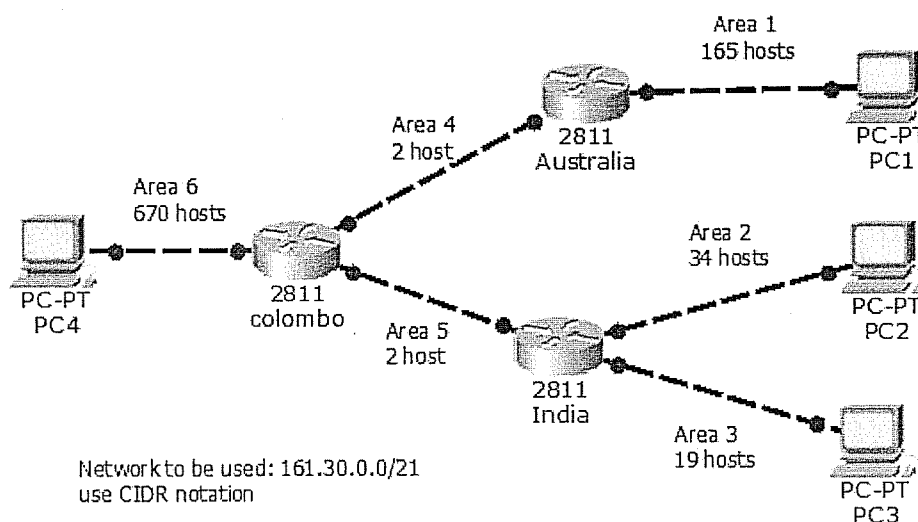
1.3) Suggest proper IP addresses for Ethernet interfaces 0, 1, 2 (connecting Area 2, 3 and 5) of the India router based on your answer to the 1.2. Write the appropriate CLI commands to assign IP address to the Ethernet Interface 0 of the India router.

QUESTION 2

2.1) Draw a diagram to show the three-way handshake mechanism in TCP connection establishment with the proper sequence and acknowledgement numbers.

2.2) What is meant by an organizational unit (OU) in windows active directory?

2.3) Briefly explain the terms *scope* and *reservation* in the context of DHCP.

QUESTION 3

3.1)   Write the appropriate Linux commands to do the following operations.

    i)   Copy a sub directory named *www* in the *etc* directory in root directory to the *opt* directory in root folder

    ii)   Remove a file named *test* in the *var* directory in the root directory.

3.2)   Describe the operation of a symmetric key algorithm using a diagram or an equation. Name one symmetric key algorithm used in the modern computer networks.

3.3)   List the tables and their corresponding chains in an "IP tables" firewall.

3.4)   Suppose you have a following firewall setup in a Linux server. (all subnet masks are /24)
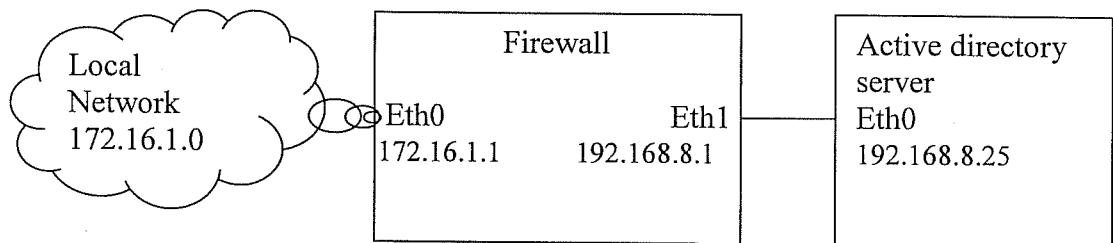
Write proper firewall rules to allow the following traffic

    i)   Any web traffic (secure / unsecure) coming to the Active directory server 192.168.8.25 has to be allowed and replies of established connections should be properly sent out.

    ii)   "Ping Operation" from the 172.16.1.0 network to the firewall has to be allowed.

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