Uva Wellassa University of Sri Lanka
Faculty of Science and Technology
Department of Computer Science and Technology
400 level 1st Semester Examination – Jul. / Aug. 2016
CST441-2 Advanced Networking and Applications

Uva Wellassa University

Instructions to candidates
Duration: Two (02) hours
Number of questions: Five(05) essays
Answer four (04) questions only
Mark allocation: 100

1.

a. Briefly describe the necessity of OSI Reference Model. (5 mark)

b. What is the major function of the Physical Layer? (3 mark)

c. Compare and contrast straight forward and cross over cables. (4 mark)

d. Briefly explain the sub layers of the Data Link Layer. (5 mark)

e. List any three (03) types of information that will be added to the packet header. (3 mark)

f. Give any three (03) protocols that work in presentation layer and describe briefly how they work. (5 mark)

2.

a. Briefly describe the function of the network layer in OSI Model. (3 mark)

b. What are the differences between routing and forwarding? Briefly explain each of them. (4 mark)

c. Give any two (02) fields those are updated in the packet during normal IP packet forwarding in a router? (3 mark)

d. The topology given below consists of multiple routers interconnected by links. Each link has a static cost associated with it which represents the cost of sending data over the link. (15 mark)

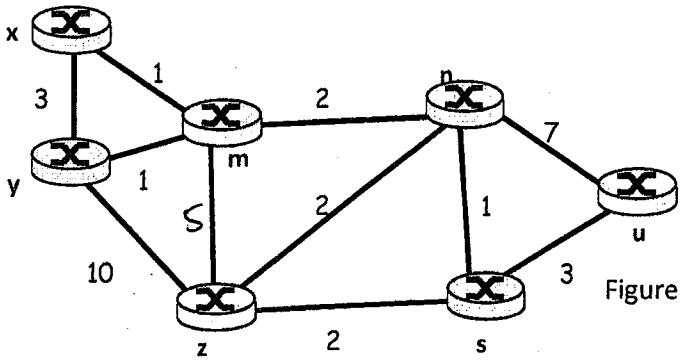

Figure 01

i. Use Dijkstra's shortest-path algorithm to compute the shortest path from y to all network nodes. Show your work by computing a table similar to the table below.

N'	D(x),p(x)	D(m),p(m)	D(z),p(z)	D(n),p(n)	D(s),p(s)	D(u),p(u)
y	3,y	1,y	10,y	Inf	inf	Inf

04 (13)

3.

Consider the IP address 18.26.1.104 for the questions given below.

a. Suppose that we were still using class-based addressing. What type of network would this IP address be a part of? (5 mark)

b. If the network administrator had decided to break the network in part a into **64** different subnets, what would the subnet mask of the subnet to which this IP address belongs? (5 mark)

c. What is the subnet number (address) of the subnet to which this IP adderess would be attached? (3 mark)

d. What would the length of Classeless Inter Domain Roting (CIDR) prefix for the physical network written for above question **(3.c.)** to which the host were attached be? (4 mark)

e. Give the network, first host, last host, and broadcast adresses of the second and last subnets. (8 mark)

4.

Consider the network configuration plan of Department of Computer Science and Technology (CST) given below.

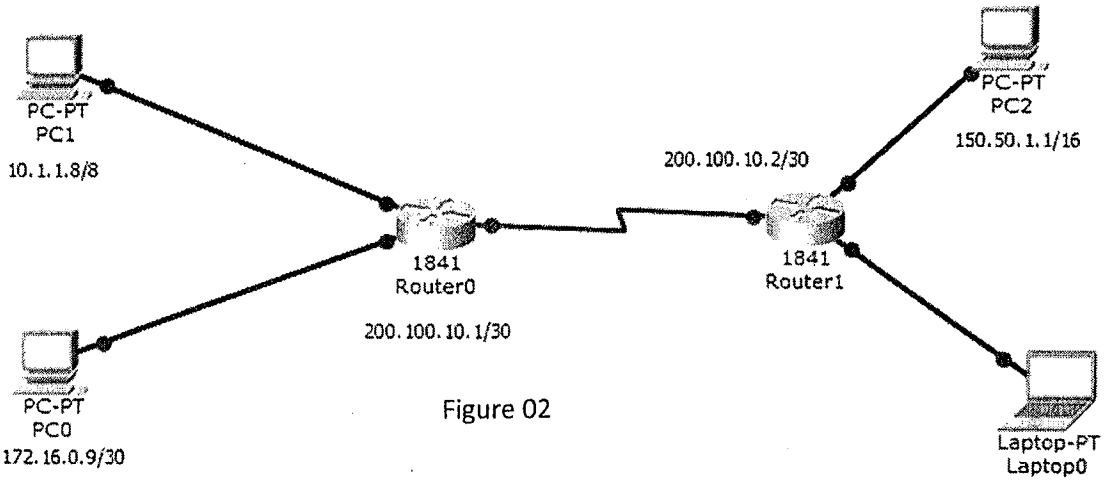

Figure 02

a. Which type of interfaces you will use to link these laboratories? (3 mark)

b. Configure the following information to the routers.
   i. Name the router as CST.
   ii. Create a welcome banner as "Welcome to CST".
   iii. Update the date and time as 27/07/2016 2.30 PM.

(10 mark)

c. Write the command line script to link the laboratories by configuring an **appropriate** routing. (12 mark)

5.

a. State the the two (02) major protocols those work in the transport layer.

(2 mark)

b. Compare and contrast the protocols written for the above question(**5.a**.).

(5 mark)

c. Briefly explain why we need an acknowledgement (ack).

(2 mark)

d. Briefly describe how rdt3.0 solve the problems given below.

   i. Loss of a packet.
   ii. Loss of a ack.
   iii. Delayed ack.

(9 mark)

e. Explain how the Dynamic Source Routing (DSR) route discovery works in the phenomenon given below.

(7 mark)

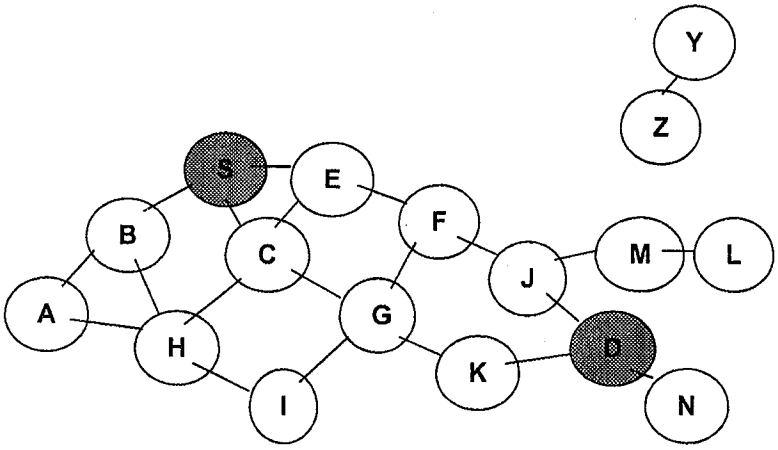

Figure 03

S= Source , D=Destination

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