Shahjalal University of Science & Technology

Department of Computer Science & Engineering

3rd Year 2nd Semester Final Examination' 2018 (Session: 2015-16)

Course No: CSE 361, Title: Computer Networking

Credits : 3.0 Full Marks : 100 Time : 3 Hours

Group A (answer ALL the questions)

Q1 Answer any TEN **10*1**

a. Expand the IPv6 address to its original- 0:15::1:12:1213

b. If an IP address uniquely defines a host on the internet, then what does a port address do?

c. Assume five devices are arranged in a full mesh topology. How many cables are needed?

d. If you are to connect a PC to switch, which cable (Crossover or Straight-through) would you use?

e. Write a link-local address.

f. What is the difference between pure ALOHA and slotted ALOHA?

g. 11100010.23.14.227 –Is it a valid IPv4 address? Why?

h. Name a path vector routing protocol.

i. What is meant by "maximum burst size" for a network?

j. What is a trap message?

k. If the cipher text for the plain text "GAME" is "MAEG", then which types of cipher it is?

l. Which encapsulation is used in dynamic VPN?

m. Show the traffic profile for VBR.

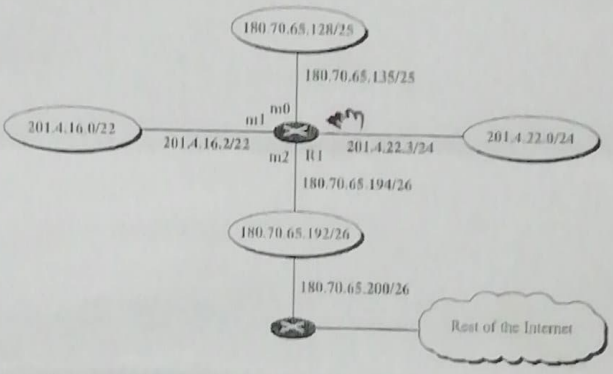
n. To assign IP addresses automatically to devices from an address pool, which protocol is used?

o. Correct the sentence: "Both ARP request and reply is broadcast message."

Q2 Answer any FOUR **4*5**

a. What is "*two node instability problem*" in Link State routing protocol? How this problem can be solved? 2+3

b. Construct a routing table for R1 for the following topology and write the forwarding process if a packet arrives at R1 with destination address 180.70.65.140. 2+3



c. Describe the open loop congestion control mechanisms in brief. 5

d. i. Suppose Lily and Mily are about to start a transmission. They want to generate a session key using Diffie-Hellman algorithm. If they use g = 7 and p = 23, then find the symmetric key *K* for the session. 3

ii. Assume Bill received a cipher text "26" which John sends him using RSA encryption. Here, p = 11 , q = 7, e= 13 and d = 37. Decrypt the cipher text into plain text. 2

e. Use FLSM to find out the followings of the given network address, 172.16.5.0/20 with 2 sub-network of 850host and 256hosts.

i. How many subnets can be configured? 1

ii. What are the network addresses of those subnets? 2

iii. What is the 5th host address of 3rd subnet? 2

f. What is anycast address? Find wildcard mask for for 192.16.7.3/26. Why classless addressing was introduced over classful addressing? 1+4

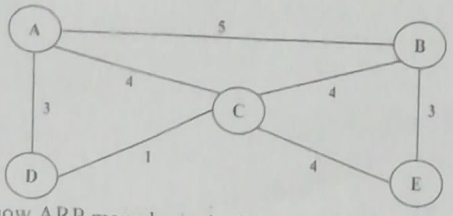
Q3. Answer any TWO **2*10**

a. i. Define: SONET and SDH. Write down the main functions of network management system. 6

ii. How SMI and MIB supports SNMP? 4

b. Suppose, you have an IT firm in Varsity Gate named VGIT. Recently, you have owned another company in Surma named SIT. You also own the IP 204.15.5.0/24. Both of your companies have two branches (IT, Admin) each. The IT and admin branches of VGIT have 64 and 14 PCs respectively. On the other hand, SIT has 7 and 28 PCs in admin and IT branches respectively. You can afford at least two routers. Is it possible to manage the whole topology with the current IPs? If yes, then find the network address, first usable IP, last usable IP for each network; if no, then explain the difficulties and calculate how many IPs are lacking. 10

c. i. Show the formation of routing table for node A in OSPF for the following topology: 6



ii. Describe how ARP maps logical address to physical address? 4

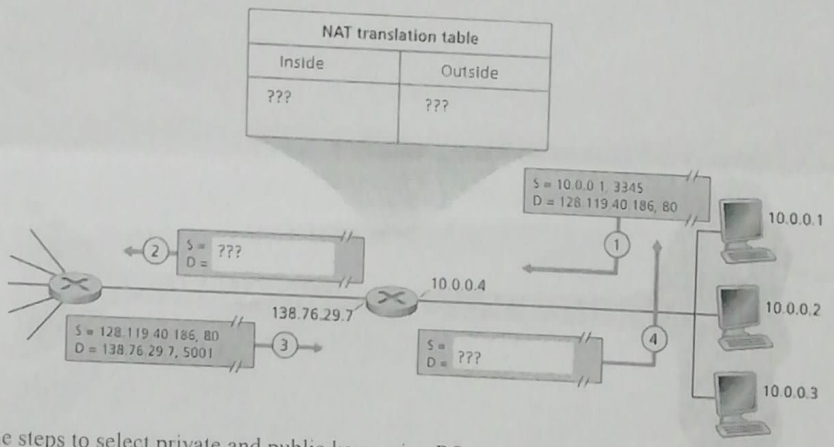
Group B (answer ALL the questions)

Q4 Answer any TEN **10*1**

a. Abbreviate the IPv6 address- FDEC:0074:0000:0000:0000:B0FF:0000:FFF0
b. Give example of a physical address.
c. Which types of LAN standard/ specifications are defined by IEEE 802.11?
d. What is an access point?
e. Write a site-local address.
f. Name different types of Cipher.
g. What is proxy ARP?
h. Find the Caesar cipher text for the word "CSE".
i. How many host bit is there in the network 172.16.9.15/27 ?
j. Fill in the blank: RIP sends periodic updates every _____ seconds.
k. Correct the sentence: *Open Shortest Path First* is a path vector routing protocol.
l. What is the size of message digest in SHA-1?
m. What is the purpose of ***tracert*** command?
n. What is a jitter in a network?
o. What is a one-password?

Q5. Answer any FOUR

a. What does NAT do? Assume the following scenario of four consecutive messages of a transmission. Construct the following NAT table and fill up the question marks with proper addresses. Please draw the whole figure to answer your question. **4*5** 1+4



b. Write the steps to select private and public keys using RSA algorithm. Assume John wants to send the plain text "5" to Bill using asymmetric key encryption. John chooses p = 11 , q = 7, e= 13 and d = 37. Find the cipher text using RSA algorithm. 3+2
c. Find out the network address, gateway address, broadcast address, subnet mask and available host address range of the following IPv4 address : 192.16.5.5/25 5*1
d. What is weighted fair queuing? Name two techniques for shaping traffic to improve QoS. Find the aggregated Network address for the following networks: 192.18.10.0/22, 192.18.14.0/26 and 192.18.8.0/25 1+2+2
e. What is the access method of wireless LAN? Differentiate between circuit-switched network and packet-switched network. 1+4
f. i. What is VLAN? Write the loop-back address. Why ***ping*** and ***ifconfig*** commands are used? 1+2
ii. Determine the type of following Ethernet addresses:
1) 4A:30:10:21:10:1A and 2) 47:20:1B:2E:08:EE

Q6 Answer any TWO **2*10**

a. i. What is VPN? Which encapsulation and encryption methods are used to apply static VPN? 4
ii. What are the techniques for transition from IPv4 to IPv6? 2
iii. Write short note on any two from the following: i) HTTP ii) DNS iii) FTP 4
b. i. Define the following attacks: Dictionary attack and man-in-middle attack. 3
ii. How salting is applied on fixed password? 3
iii. What is message digest? What are the main criteria for hash function? 4
c. i. Describe ICMP query messages in brief. 6
ii. List all types of IGMP messages. Change the multicast IP address 238.212.14.7 to an Ethernet multicast physical address. [Hint: An Ethernet multicast physical address is in the range from 01:00:5E:00:00:00 01:00:5E:7F:FF:FF] 2+2