DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF TECHNOLOGY
B.TECH. SEMESTER V [INFORMATION TECHNOLOGY]
SUBJECT: (IT 505) COMPUTER AND COMMUNICATION NETWORK

Examination	**: Second Sessional**	**Seat No.**	**: _____**
Date	**: 02/09/2015**	**Day**	**: Wednesday**
Time	**: 12 :00 to 1:15**	**Max. Marks**	**: 36**

INSTRUCTIONS:
1. Figures to the right indicate maximum marks for that question.
2. The symbols used carry their usual meanings.
3. Assume suitable data, if required & mention them clearly.
4. Draw neat sketches wherever necessary.

Q.1 Do as directed.(No Marks Without Justification)

(a) Two computers Cl and C2 are configured as follows. Cl has IP address 203.197.2.53 and netmask 255.255.128.0. C2 has IP address 203.197.75.201 and netmask 255.255.192.0.which one of the following statements is true? **[2]**
(A) Cl and C2 both assume they are on the same network
(B) C2 assumes Cl is on same network, but Cl assumes C2 is on a different network
(C) Cl assumes C2 is on same network, but C2 assumes Cl is on a different network
(D) Cl and C2 both assume they are on different networks.

(b) In an IPv4 datagram, the M bit is 0, the value of IHL is 10, the value of total length is 400 and the fragment offset value is 300. The position of the datagram, the sequence numbers of the first and the last bytes of the payload, respectively are **[2]**
(A) Last fragment, 2400 and 2789 (B) First fragment, 2400 and 2759
(C) Last fragment, 2400 and 2759 (D) Middle fragment, 300 and 689

(c) A Host P sends a datagram to Host Q over a network. Which of the following field(s) of an IP header may be different from that of the original datagram? (1) Checksum (2) Source address (3) Time to Live (TTL) (4) Total Length (5) Fragment Offset **[2]**
(A) 1 & 2(B) 2 only (C) 1,3,4 & 5 (D) 1 ,3 & 5

(d) In a packet switching network, packets are routed from source to destination along a single path having two intermediate nodes. If the message size is 24 bytes and each packet contains a header of 3 bytes, then the optimum packet size is: **[2]**
(A) 4 (B) 6 (C) 7 (D) 9

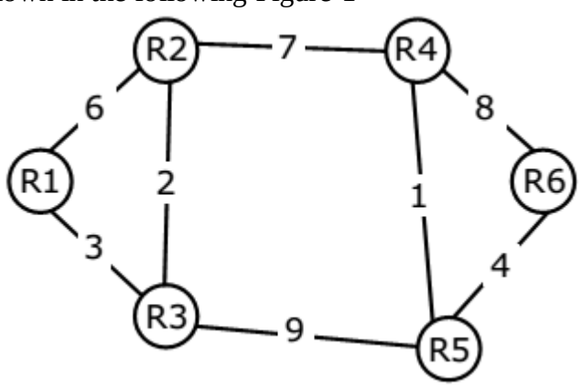
(e) Give differences between virtual circuit subnet and datagram subnet. **[2]**

(f) Distinguish between ARP and RARP. **[2]**

Q.2 Attempt ***Any Two*** from the following questions. **[12]**

(a) **(1)**Suppose that instead of using 16bits for the network part of a class B, 20bits had been used. How many class B network would there have been? **[2]**
(2) In the network 200.20.11.144/27, What is the last IP address of the network which can be assigned to a host? **[2]**
(3) A company has a class C network address of 204.204.204.0. It wishes to have three subnets, one with 100 hosts and two with 50 hosts each. Which one of the following options represents a feasible set of subnet address/subnet mask pairs? **[2]**
(A) 204.204.204.128/255.255.255.192 204.204.204.0/255.255.255.128 204.204.204.64/255.255.255.128
B) 204.204.204.0/255.255.255.192 204.204.204.192/255.255.255.128 204.204.204.64/255.255.255.128
(C) 204.204.204.128/255.255.255.128 204.204.204.192/255.255.255.192 204.204.204.224/255.255.255.192
(D) 204.204.204.128/255.255.255.128 204.204.204.64/255.255.255.192 204.204.204.0/255.255.255.192

(b) Consider a network with 6 routers R1 to R6 connected with links having weights as shown in the following Figure-1



All the routers use the distance vector based routing algorithm to update their

routing tables. Each router starts with its routing table initialized to contain an entry for each neighbor with the weight of the respective connecting link.
(1) After all the routing tables stabilize, how many links in the network will never be used for carrying any data? **[3]**
(2) Suppose the weights of all unused links in the previous question are changed to 2 and the distance vector algorithm is used again until all routing tables stabilize. **[3]**
How many links will now remain unused?

(c) An IPv4 datagram has arrived with the following information in the header in hexadecimal **[6]**
45 00 00 54 00 03 58 50 20 06 00 00 7C 4E 03 02 B4 0E 0F 02
(1) What is source IP address? **(2)**What is total length of packet? **(3)** How many more routers can the packet travel to? **(4)** Are there any options? **(5)** What is the identification number of the packet? **(6)** What is the size of the data?

Q.3 (a) Consider a network with five nodes, N1 to N5, as shown Figure-2
The network uses a Distance Vector Routing protocol. Once the routes have stabilized, the distance vectors at different nodes are as following
N1: (0,1,7,8,4) N2 : (1,0,6,7,3) N3: (7,6,0,2,6) N4 : (8,7,2,0,4) N5 : (4,3,6, 4,0)
(1) The cost of link N2-N3 reduces to 2 in (both directions). After the next round of Updates, what will be the new distance vector at node, N3? **[3]**
(2) After the update in the previous question, the link N1-N2 goes down. N2 will Reflect this change immediately in its distance vector as cost, ∞. After the NEXT ROUND of update, what will be the cost to N1 in the distance vector of N3? **[3]**

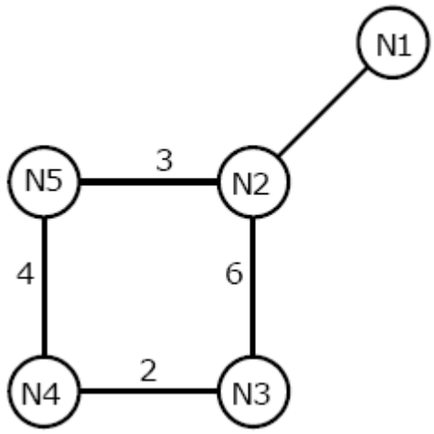


Figure-2

(b) Explain in detail congestion control in virtual circuit and datagram subnet. **[6]**

OR

Q.3 (a) Consider the following routing table at an IP router:

Network No.	**Next Hop**
128.96.170.0/23	Interface 0
128.96.168.0/23	Interface 1
128.96.166.0/23	R2
128.96.164.0/22	R3
Default	R4

For each IP address in Group I identify the correct choice of the next hop from Group II using the entries from the routing table above.

Group I	**Group II**
(1)128.96.171.92	(a)Interface 0
(2)128.96.167.151	(b)Interface 1
(3)128.96.163.151	(c)R2
(4)128.96.165.121	(d)R3
	(e)R4

[1]
[1]
[2]
[2]

(b) Consider sending a 2400 byte datagram into a link that has an MTU of 700 bytes. **[2]**
Suppose the original datagram is stamped with the identification number 422. **[2]**
(1) How many fragments are generated? **(2)**What is the size of all fragments? **[2]**
(3) What are the offset value, flag value and identification number of all fragments?