53 (IT 403) CPNW

2018

COMPUTER NETWORKS

Paper : IT 403

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions.*

1. *(a)* ARP cache entries timeout after 5 minutes. Describe the problems that can occur if the timeout value is too large or too small. 5

   (b) Assume that an organization has been assigned the 196.35.1.0/24 network address. The organization decides to create subnets that will support at least 20 hosts.

      (i) Specify the length of subnet address that will allow creation of at least 20 hosts on each subnet.

(ii) What is the maximum number of hosts that can be supported on one subnet?

(iii) What is the maximum number of subnets?

(iv) Write the subnet address in dotted decimal notation.

(v) What is the broadcast address of subnet 196.35.1.192? 15

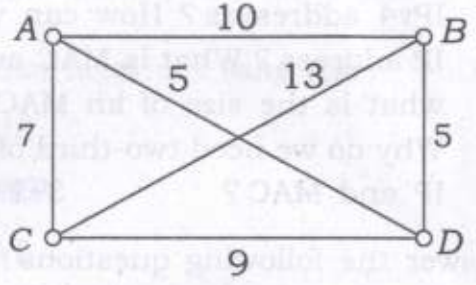
2. (a) Suppose a TCP message contains 2048 octets of data and 20 octets of TCP header. The message is passed through two IP networks N1 and N2. N1 has MTU size of 1024 octets and N2 has MTU size of 512 octets. Give the sizes and offsets of the sequence of fragments delivered to the destination. Assume IP headers to be 20 octets long. 10

(b) For the internetwork given in the following figure, give the distance vector of each node,

(i) when each router know the distances to its immediate neighbours only.

(ii) when A sends its distance vector to its neighbours.

(iii) when B sends its distance vector to its neighbours after step (ii) above.



10

3. What are the advantages of dynamic routing over static routing algorithms? What is Count to Infinity problem? Explain with an example. What are the solutions to Count to Infinity problem? Why does it not occur in case of Link-state routing? Give examples of *two* routing protocols. 3+5+6+4+2=20

4. (a) Why is TCP called connection-oriented protocol? How does TCP provide reliability? Compare and contrast TCP and UDP. 3+4+5=12

(b) Explain TCP congestion control mechanism with a diagram. 8

5. *(a)* Explain in details about advanced features present in IPv6 but not in IPv4. 6

(b) Can two machines have same IP address ? What is the total number of IPv4 addresses ? How can you get an IP address ? What is MAC address and what is the size of an MAC address ? Why do we need two-third of addresses IP and MAC ? 3+2+3+2+4=14

6. Answer the following questions : 2×10=20

(a) Express the IP address in binary form and identify its class 145.32.59.22.

(b) What is the difference between congestion control and flow control ?

(c) Mention *two* Application Layer Protocols.

(d) What is World Wide Web ?

(e) Define Jitter and Throughput.

(f) What is encryption and decryption ?

(g) Why IP is said to provide best effort service ?

(h) What is the function of presentation layer ?

(i) What is a port number ? What is the size of a port number ?

(j) What is TTL field in IP header ?

7. Write short notes on : ***(any two)*** 10×2=20

(a) DNS

(b) ICMP

(c) NAT.