53 (CS 815) TDIM

2017

TCP/IP-DESIGN AND IMPLEMENTATION

Paper : CS 815

Full Marks : 100

Time : Three hours

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

Question no. ***1*** *is* ***compulsory*** *and answer* ***any four*** *from the rest.*

1. Answer the following : 10×2=20

   (a) Physical address of machine is ——— bits long whereas length of a port address is ——— bits.

   (b) What do you mean by loopback address ?

(c) A host with IP address 108.67.18.20 sends a limited broadcast packet to all hosts in the same network. What are the source and destination IP address used in this case ?

(d) State the difference between subnetting and supernetting.

(e) A host with IP address 137.23.56.23/16 sends a packet to a host with IP address 142.3.6.9/24. Is the delivery direct or indirect ? Justify.

(f) Define IP fragmentation.

(g) In a block of addresses, we know the IP address of one host is 182.44.82.16/26. What is the first address (network address) and the last address (limited broadcast address) in this block ?

(h) What do you mean by universal port no. ?

(i) What is the port no. of TELNET and SMTP ?

(j) What do you mean by a socket ?

Answer ***any four*** *questions.*

2. *(a)* An ISP is granted a block of address starting with 150.80.0.0/16. The ISP wants to distribute these blocks to 2600 customers as follows : 10+2=12

   (i) The first group has 200 medium-size businesses ; each needs approximately 128 addresses.

   (ii) The second group has 400 small businesses ; each needs approximately 16 address.

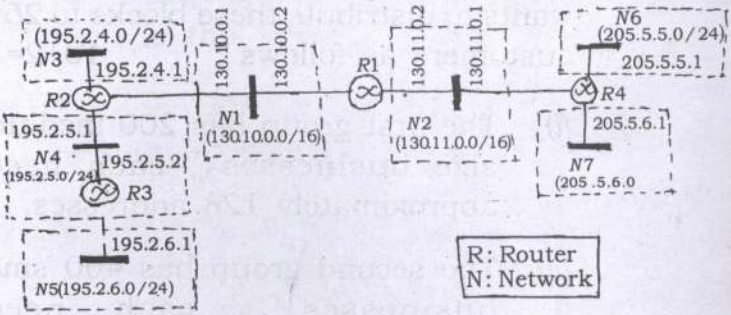
   (iii) The third group has 2000 households ; each needs 4 addresses.

   Design the subblocks and give the slash notation for each subblock. Find out how many addresses are still available after these allocations.

   (b) Compare link state routing and distance vector routing. Explain the count-to-infinity problem in brief. 4+4=8

3. *(a)* What do you mean by an autonomous system ? Define intradomain and interdomain routing. 2+4=6

(b) Figure below shows the diagram of an autonomous system consisting of routers and networks : 14



Using Routing Information Protocol, create the routing tables for the various routers, showing each step in details.

4. (a) Discuss OSPF protocol for a large autonomous system. Make use of an example network to show how a routing table is created by using OSPF. 15

(b) Explain Border Gateway Protocol in brief. 5

5. (a) Discuss the various fields in a TCP segment in brief. 10

(b) The following is a dump of a TCP segment header in hexadecimal format. $(05320017000000010000000500207F F00000000)_{16}$ 5

(i) What is the source port number ?

(ii) What is the destination port number ?

(iii) What is the sequence number ?

(iv) What is the acknowledgement number ?

(v) What is the window size ?

(c) List out some uses of UDP. 5

6. (a) Explain with diagram the three steps (connection establishment, data transfer and connection termination) required for a TCP connection. 10

(b) Discuss the IPv6 frame format with the help of a diagram. 10

7. Write short notes on : 4×5=20

(a) Remote Login

(b) DHCP

(c) FTP

(d) DNS