Department of Computer Science and Engineering
Institute of Technical Education & Research, SOA, Deemed to be University

WEEK-END ASSIGNMENT-03

Computer Networking Workshop (CSE 4541)

Publish on: 24-03-2023 **Submission on:** 30-03-2023
Course Outcome: CO_1 **Program Outcome:** PO_1, PO_3 **Learning Level:** L_4

Working with classful IPV4 address configuration

1. Determine the operating mode of the ports, either half-duplex or full-duplex, in the following situations;
   (a) With a connection from a switch to a host
   (b) With a connection from a switch to a switch
   (c) With a connection from a host to a host
   (d) With a connection from a switch to a router
   (e) With a connection from a router to a router
   (f) With a connection from a router to a host
   (g) With a connection from a hub to a host
   (h) With a connection from a switch to a hub
   (i) With a connection from a router to a hub
   (j) With a connection from a hub to a hub

Answer	Remark
(a) FULL DUPLEX	☐
(b) FULL DUPLEX	☐
(c) HALF DUPLEX	☐
(d) FULL DUPLEX	☐
(e) FULL DUPLEX	☐
(f) FULL DUPLEX	☐
(g) HALF DUPLEX	☐
(h) HALF DUPLEX	☐
(i) HALF DUPLEX	☐
(j) HALF DUPLEX	☐

2. Find the class of each IP address.
   (a) 10000001 00001011 00001011 11101111
   (b) 0000001 10000011 00011011 11111111
   (c) 14.23.120.8
   (d) 252.5.15.111

Answer	Remark
(a) CLASS - A	☐
(b) CLASS - A	☐
(c) CLASS - A	☐
(d) CLASS - D	☐

3. Find the network address of the given IP addresses.
   (a) 23.56.7.91
   (b) 132.6.17.85
   (c) 192.23.120.8
   (d) 200.5.15.111

Answer	Remark
(a) 23.0.0.0	☐
(b) 132.6.0.0	☐
(c) 192.23.120.0	☐
(d) 200.5.15.0	☐

4. Determine the class from the given network addresses

   (a) 10.0.0.0

   (b) 130.130.0.0

   (c) 200.200.200.0

   (d) 172.31.0.0

Answer	Remark
(a) CLASS-A	☐
(b) CLASS-B	☐
(c) CLASS-C	☐
(d) CLASS-B	☐

5. Find the netID and hostID of the following classful IP addresses.

   (a) 114.34.2.8

   (b) 132.56.8.6

   (c) 208.34.54.12

   (d) 10.10.10.10

Answer	Remark
(a) 114, 34.2.8	☐
(b) 132.56, 8.6	☐
(c) 208.34.54, 12	☐
(d) 10, 10.10	☐

6. Determine default mask for the given IP addresses

   (a) 10.0.0.5

   (b) 130.130.0.5

   (c) 200.200.200.5

   (d) 172.31.0.5

Answer	Remark
(a) 255.0.0.0	☐
(b) 255.255.0.0	☐
(c) 255.255.255.0	☐
(d) 255.255.0.0	☐

7. You are the Cisco administrator for your company. A new branch office is opening and you are selecting the necessary hardware to support the network. There will be two groups of computers, each organized by department. The Sales group computers will be assigned IP addresses ranging from 192.168.1.2 to 192.168.1.50. The Accounting group will be assigned IP addresses ranging from 10.0.0.2 to 10.0.0.50. What type of device should you select to connect the two groups of computers so that data communication can occur?

   (a) HUB

   (b) Switch

   (c) Router

   (d) Bridge

Answer	Remark
Router	☐
Justification: Type of device we should select connect the two group of computer so that data communication can occur. Computers are in different Subnet	

8. Suppose computers A and B have IP addresses **10.105.1.113** and **10.105.1.91** respectively and they both use the same netmask N. Which of the values of N given below should not be used if A and B should belong to the same network. **[GATE 2010]**

   (a) 255.255.255.0

   (b) 255.255.255.128

   (c) 255.255.255.192

   (d) 255.255.255.224

Answer	Remark
255.255.255.224	☐
Justification: value of N given should not be used if A & B are in same network.	

9. In the IPv4 addressing format, the number of networks allowed under Class C addresses is **[GATE 2012]**

(a) 2^{14} (c) 2^{21}

(b) 2^{7} (d) 2^{24}

Answer	Remark
2^{21}	☐
Justification:	

10. An Internet Service Provider (ISP) has the following chunk of CIDR-based IP addresses available with it: 245.248.128.0/20. The ISP wants to give half of this chunk of addresses to Organization A, and a quarter to Organization B, while retaining the remaining with itself. Which of the following is a valid allocation of addresses to A and B? **[GATE 2012]**

(a) 245.248.136.0/21 and 245.248.128.0/22

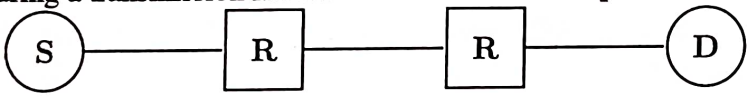
(b) 245.248.128.0/21 and 245.248.128.0/22

(c) 245.248.132.0/22 and 245.248.132.0/21

(d) 245.248.136.0/24 and 245.248.132.0/21

Answer	Remark
	☐
Justification:	
245.248.136.0 / 21	
and	
245.248.128.0/22	

11. Assume that source S and destination D are connected through two intermediate routers labeled R. Determine how many times each packet has to visit the network layer and the data link layer during a transmission from S to D. **[GATE 2012]**



(a) Network layer 4 times and Data link layer 4 times

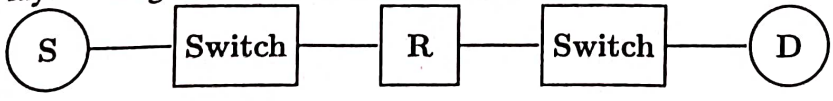
(b) Network layer 4 times and Data link layer 3 times

(c) Network layer 4 times and Data link layer 6 times

(d) Network layer 2 times and Data link layer 6 times

Answer	Remark
c) Network layer 4 times and Data link layer	☐
Justification: 6 times.	

12. Assume that source S and destination D are connected through as shown in the figure with R as Router. Determine how many times each packet has to visit the network layer and the data link layer during a transmission from S to D.



(a) Network layer 4 times and Data link layer 4 times

(b) Network layer 4 times and Data link layer 3 times

(c) Network layer 3 times and Data link layer 6 times

(d) Network layer 2 times and Data link layer 6 times

Answer	Remark
c)	☐
Justification:	
Network layer 3 times and Data link layer 6 times	

13. Suppose that instead of using 16 bits for the network part of a class B address originally, 20 bits had been used. How many class B networks would there have been?

Answer	Remark
2^{20} Networks	☐

14. Let us consider a routing table is given below. Find the interface on which the packet will move with the destination address 200.1.2.22

Network address	Subnet mask	Interface
200.1.2.0	255.255.255.192	a
200.1.2.64	255.255.255.192	b
200.1.2.128	255.255.255.192	c
200.1.2.192	255.255.255.192	d
0.0.0.0	0.0.0.0.0	e (default entry)

Answer	Remark
a) 200.1.2.0 ✗ 255.255.255.192 ⇓ network address = 2 200.1.2.0 and Interface a.	☐

Experiment:

To study the implication of Subnet mask in network using Cisco Packet Tracer (CPT)

1. Design the following network-1 using CPT and configure the **IP** and **subnet mask** of each node ($PC_{i,i=0..5}$). Send a simple PDU from source **PC0** to the destination **PC4** and observe how the PDU is moving from source to destination in both the modes of the simulator (i.e. realtime as well as simulation mode).

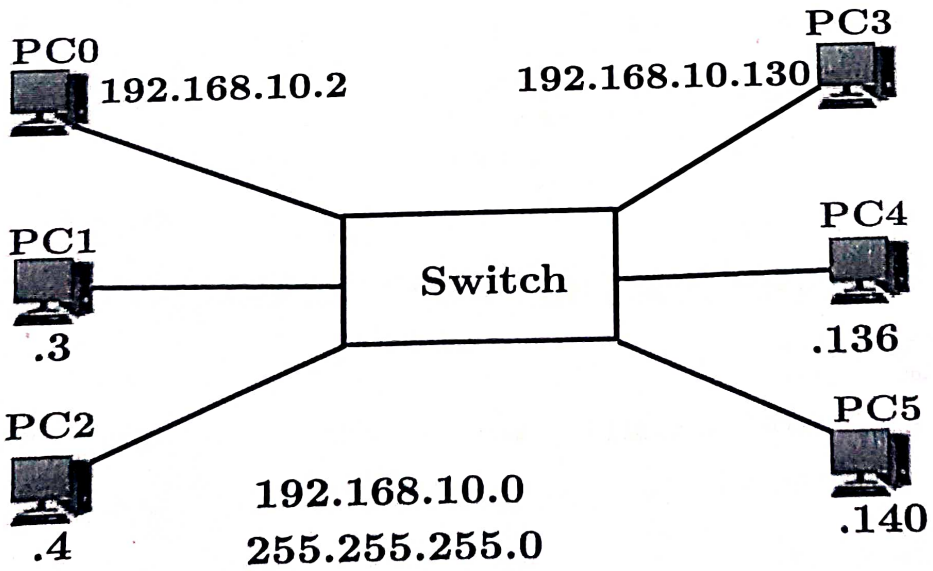
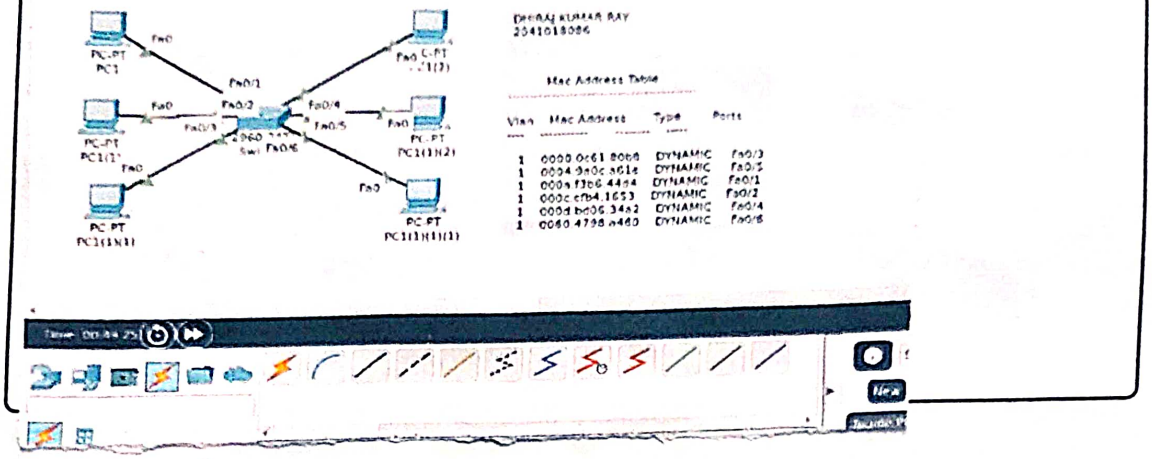


Figure 1: A Class C Switched Network

Specify your Solution for the above design problem

Paste Network Topology here | **Remark** ☐



Mention the configuration at PCs

Node/PC Name	IPv4 Address	Subnet Mask
PC0	192.168.10.2	255.255.255.0
PC1	192.168.10.3	255.255.255.0
PC2	192.168.10.4	255.255.255.0
PC3	192.168.10.130	255.255.255.0
PC4	192.168.10.136	255.255.255.0
PC5	192.168.10.140	255.255.255.0

Generate packet and forward from source to destination

	Status	Remark
(a) ICMP packet from source PC0 to PC1 in realtime mode	(a) Received	☐
(b) ICMP packet from source PC1 to PC4 in simulation mode	(b) Received	☐
(c) State the command to display MAC table	(c) Show mac address-table	☐
(d) If PC0 broadcast a packet, determine how many responses are returned to PC0	(d) 4	☐

2. To the above network shown in Figure-1, Change only the subnet mask from **255.255.255.0** to **255.255.255.128** without changing any IPV4 address of them. Again experiment the case; ***Generate packet and forward from source to destination***. State the conclusion of your observation.

	Status	Remark
(a) ICMP packet from source PC0 to PC1	(a) Received	☐
(b) ICMP packet from source PC0 to PC2	(b) Received	☐
(c) ICMP packet from source PC0 to PC3	(c) lost	☐
(d) ICMP packet from source PC0 to PC4	(d) lost	☐
(e) ICMP packet from source PC0 to PC5	(e) lost.	☐

Observartions:

State your answer

(a) Using default mask, **255.255.255.0**, in Question-1.

Here we are assigning 255.255.255.0, because we are designing to transfer the packets to all the PC's

(b) Using mask in **125.255.255.128** Question-2.

Here we are assigning 125.255.255.123, so here we can only transfer message from PC1 to PC2 & we can't transfer PC3, PC4, PC5 because they are out of range of the subnet mask

(c) Do you think that the class C network in Question-2 is broken into 2 parts? (Y/N) state your answer

Yes, due to the subnet mask, the network is broken into 2 parts

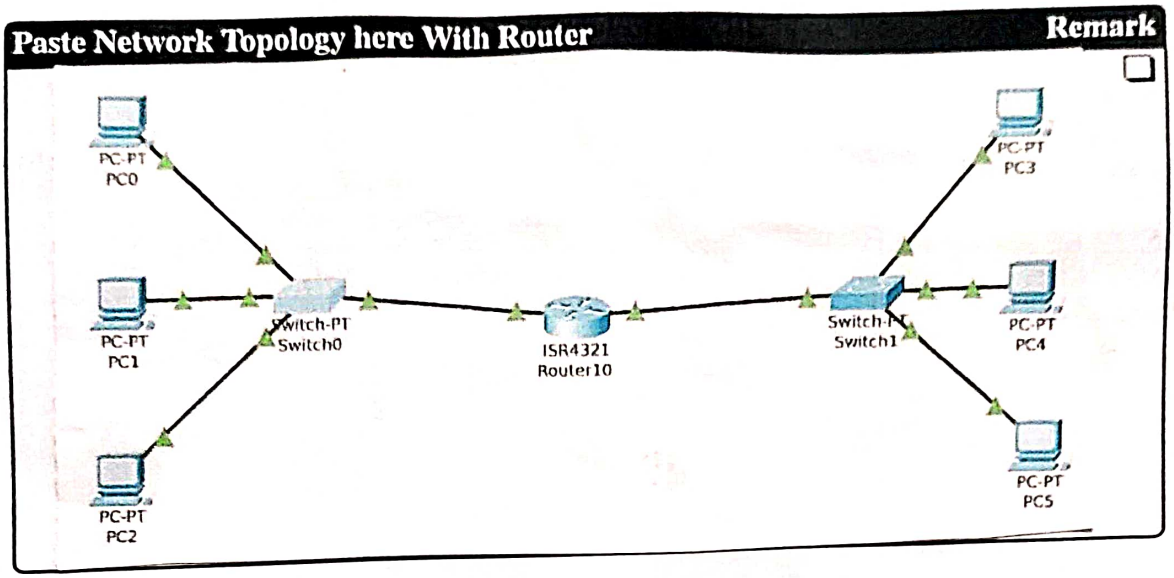
(d) Can a Switch interconnect two different networks? (Y/N) Justify your answer in favour of Y or N. If N how to connect two different networks.

yes, we can use VLAN for connecting 2 networks but it is preferable to use router for connecting two different network.

3. Modify the network shown in Figure-1 by adding a router in place of the switch. Configure Default Gateway at PCs and assign IP address art router interface configure.

Configuration & Observartions:

Paste Network Topology here With Router | **Remark**



Mention the configuration at PCs

Node/PC Name	IPv4 Address	Subnet Mask	Default Gateway
PC0	192.168.10.2	255.255.255.128	192.168.10.1
PC1	192.168.10. 3	255.255.255.128	192.168.10.1
PC2	192.168.10. 4	255.255.255.128	192.168.10.1
PC3	192.168.10.130	255.255.255.128	192.168.10.129
PC4	192.168.10.136	255.255.255.128	192.168.10.129
PC5	192.168.10.140	255.255.255.128	192.168.10.129

Observation with Router

Status	Remark
(a) Received	☐
(b) Received	☐
(c) lost	☐
(d) lost	☐
(e) lost .	☐

(a) ICMP packet from source PC0 to PC1

(b) ICMP packet from source PC0 to PC2

(c) ICMP packet from source PC0 to PC3

(d) ICMP packet from source PC0 to PC4

(e) ICMP packet from source PC0 to PC5

What do you mean by Subnet mask?

What is the role of Subnet mask?

⇒ A subnet mask is a number that distinguished the network address and the host address with in an IP address. It is smaller network within a network that requires a subnet mask.

⇒ A subnet mask is used to divide and IP address into two parts. One part host, other part identifies the network to which it belongs.