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-----------------------------**PRACTICAL 08**-----------------------------

❖ <u>**AIM :**</u> To design a network using Routing Information Protocol (RIP) and Open Shortest Path First (OSPF) Protocol.

❖ <u>**Scenario :**</u>

Design a network having 10 routers. Among them the 4 routers are used in a company's network and others are used to provide the connectivity to the outer networks. Use RIP and OSPF routing protocols in the design. Make sure all the devices are able to communicate with each other. Also make sure that the routers utilized outside the organization are using Classless Inter-Domain Routing (CIDR). So, assign the IP addresses accordingly.

✓ **Procedure :**

1. **Design network accordingly :**
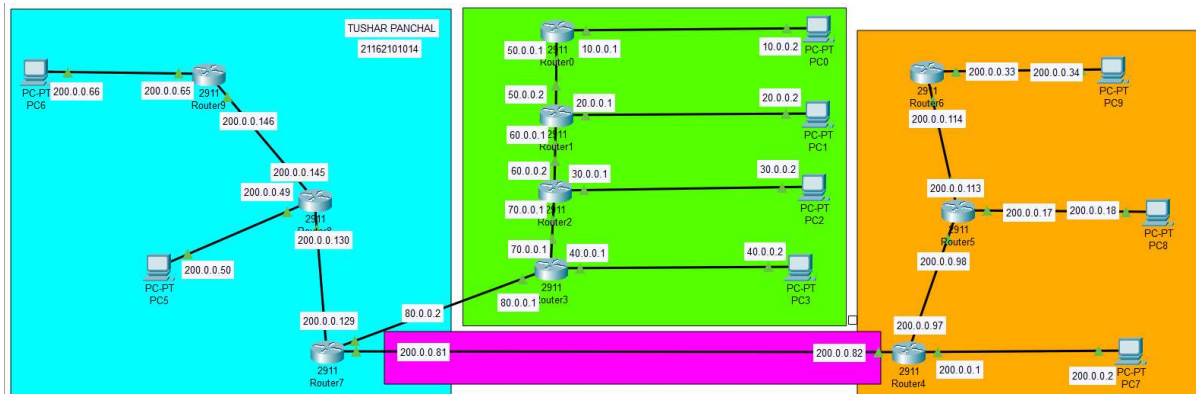
2. **Assign IP address and perform RIP routing :**
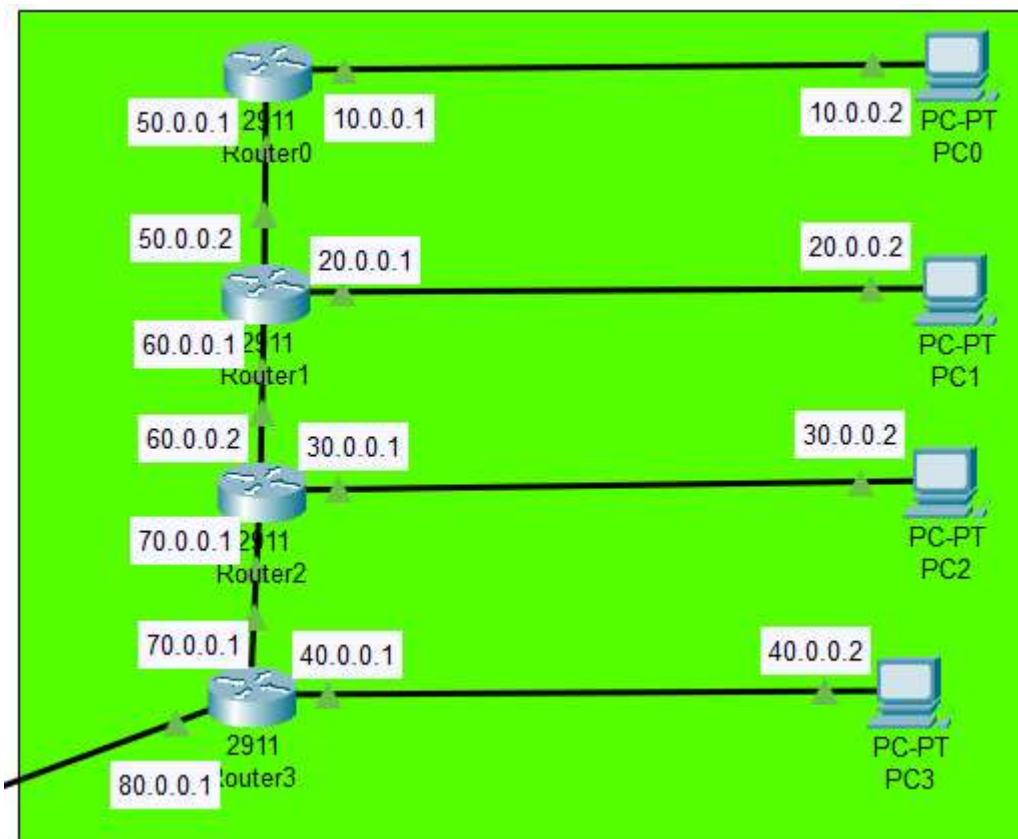
» Perform RIP routing 7 :

```
Router(config)#router rip
Router(config-router)#network 10.0.0.0
Router(config-router)#network 20.0.0.0
Router(config-router)#network 30.0.0.0
Router(config-router)#network 40.0.0.0
Router(config-router)#network 50.0.0.0
Router(config-router)#network 60.0.0.0
Router(config-router)#network 70.0.0.0
```
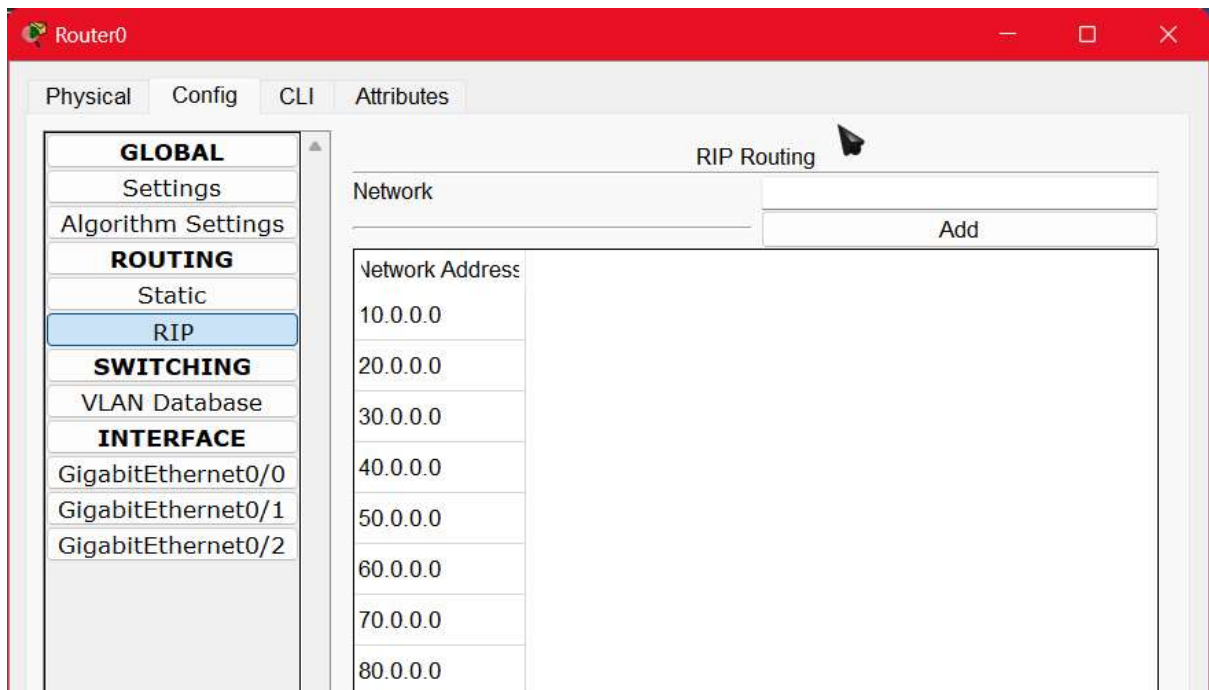

» Packet transfer successful :

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
●	Successful	PC0	PC1	ICMP	■	0.000	N	0	(edit)	(delete)

3. ASSIGN IP ADDRESS AND PERFORM OSPF ROUTING :
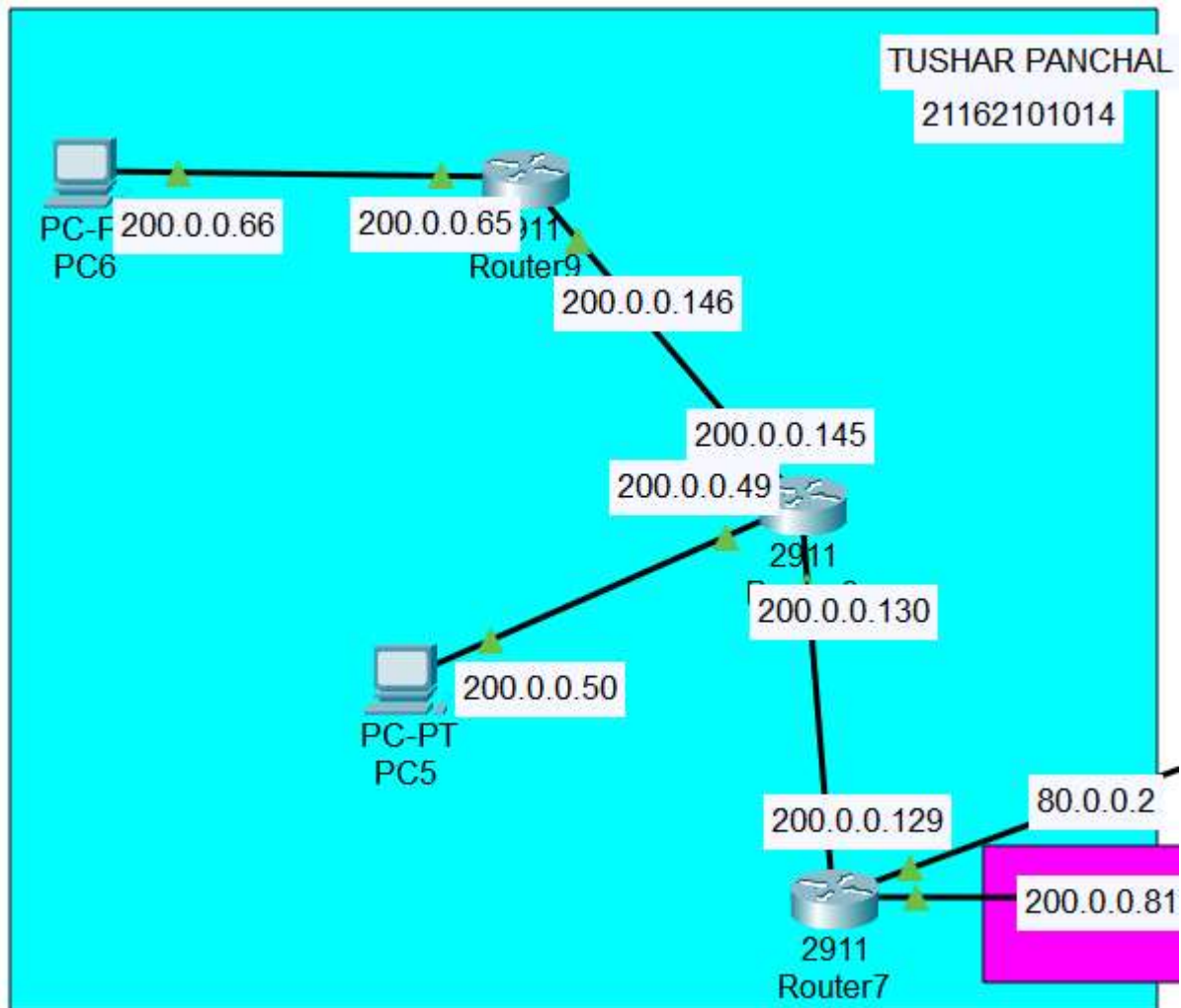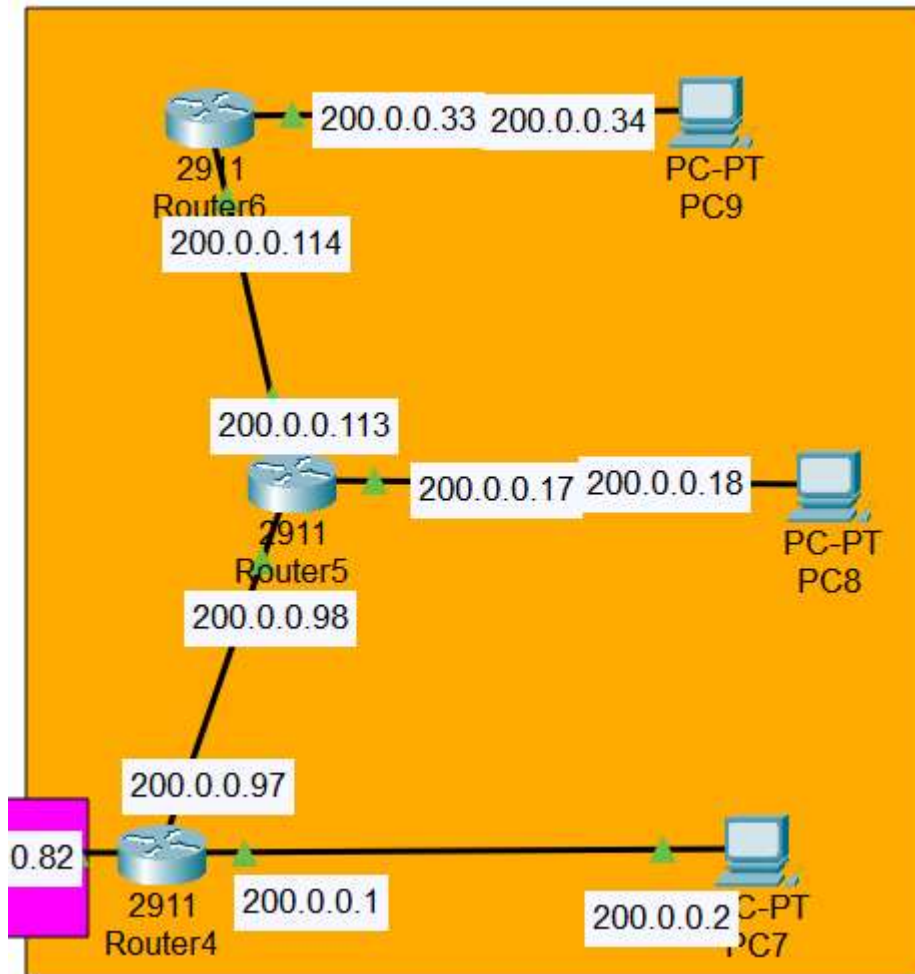
≫ LET US ASSUME WE REQUIRE 10 PC :

Req <= 2^n -2

10 <= 16 -2 taking n=4

10 <= 14

Old Subnet Mask : 255.255.255.0

New Subnet Mask : 255.255.255.240 DEP A

NIP:200.0.0.0

FIP:200.0.0.1

LIP:200.0.0.14

BIP:200.0.0.15

DEP B

NIP:200.0.0.16

FIP:200.0.0.17 LIP:200.0.0.30

BIP:200.0.0.31

DEP C

NIP:200.0.0.32

FIP:200.0.0.33 LIP:200.0.0.46

BIP:200.0.0.47

DEP D

NIP:200.0.0.48 FIP:200.0.0.49 LIP:200.0.0.62

BIP:200.0.0.63

DEP E

NIP:200.0.0.64

FIP:200.0.0.65 LIP:200.0.0.78

BIP:200.0.0.79

ROUTER 1

NIP:200.0.0.80

FIP:200.0.0.81 LIP:200.0.0.94

BIP:200.0.0.95

ROUTER 2

NIP:200.0.0.96

FIP:200.0.0.97

LIP:200.0.0.110 BIP:200.0.0.111

ROUTER 3

NIP:200.0.0.112

FIP:200.0.0.113 LIP:200.0.0.126

BIP:200.0.0.127

ROUTER 4

NIP:200.0.0.128

FIP:200.0.0.129 LIP:200.0.0.142

BIP:200.0.0.143

ROUTER 5

NIP:200.0.0.144

FIP:200.0.0.145 LIP:200.0.0.158

BIP:200.0.0.159

PERFORM OSPF

```
Router(config-if)#exit
Router(config)#router ospf 1
Router(config-router)#network 200.0.0.32 0.0.0.15 area 0
Router(config-router)#network 200.0.0.112 0.0.0.15 area 0
Router(config-router)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#wr mem
Building configuration...
```

```
Router(config)#router ospf 2
Router(config-router)#network 200.0.0.112 0.0.0.15 area 0
Router(config-router)#network 200.0.0.16 0.0.0.15 area 0
Router(config-router)#network 200.0.0.1 0.0.0.15 area 0
00:20:33: %OSPF-5-ADJCHG: Process 2, Nbr 200.0.0.114 on GigabitEthernet0/1 frnetwork
200.0.0.112 0.0.0.15 area 0
Router(config-router)#network 200.0.0.96 0.0.0.15 area 0
Router(config-router)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#wr mem
```

» Packet transfer successful :

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
●	Successful	PC6	PC9	ICMP	▮	0.000	N	0	(edit)	(delete)
●	Successful	PC7	PC5	ICMP	▮	0.000	N	1	(edit)	(delete)

4. TO TRANSFER PACKETS BETWEEN RIP AND OSPF WE NEED TO CONFIGURE ROUTER :

```
Router(config)#router rip
Router(config-router)#redistribute ospf 4 metric 1
Router(config-router)#exit
```

```
Router(config)#router ospf 4
Router(config-router)#redistribute rip metric 1
% Only classful networks will be redistributed
Router(config-router)#exit
```

» Packet transfer successful :

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
●	Successful	PC5	PC0	ICMP	▮	0.000	N	0	(edit)	(delete)
●	Successful	PC1	PC8	ICMP	▮	0.000	N	1	(edit)	(delete)

Conclusion :

In conclusion, you successfully designed and configured a network with both RIP and OSPF routing protocols. You addressed IP address assignment using CIDR, ensuring efficient utilization of IP addresses. The network is capable of facilitating communication between devices within the organization and with external networks. This practical exercise showcased your ability to design and implement network solutions using different routing protocols.