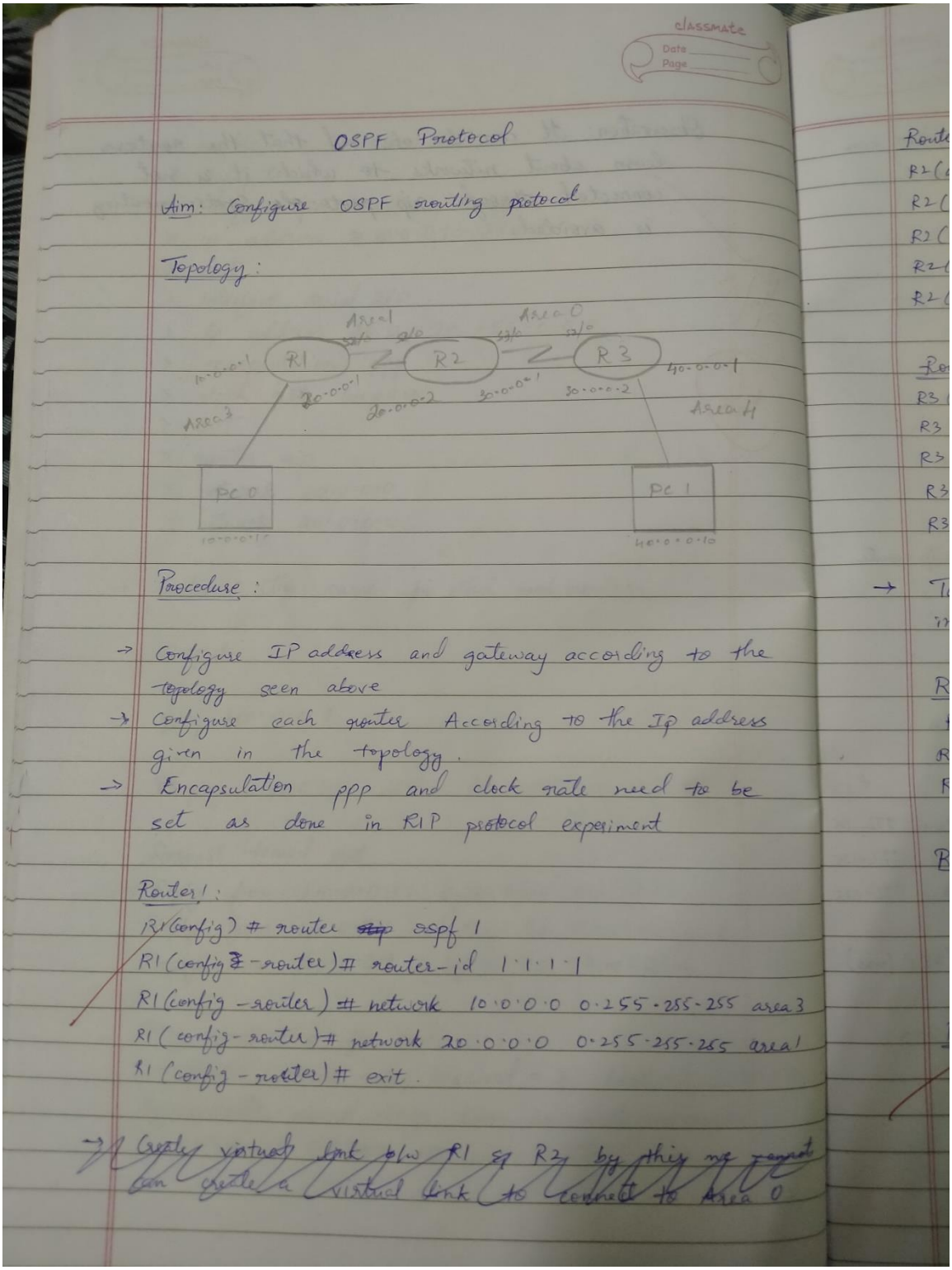
Experiment 6:

OSPF Routing protocol



OSPF Protocol

Aim: Configure OSPF routing protocol

Topology:

Procedure:

→ Configure IP address and gateway according to the topology seen above

→ Configure each router According to the Ip address given in the topology.

→ Encapsulation ppp and clock rate need to be set as done in RIP protocol experiment

Router1:

R1(config)# router ospf 1

R1(config-router)# router-id 1.1.1.1

R1(config-router)# network 10.0.0.0 0.255.255.255 area 3

R1(config-router)# network 20.0.0.0 0.255.255.255 area 1

R1(config-router)# exit.

→ Create virtual link b/w R1 & R2 by this we can create a virtual link to connect to Area 0

Router 2:

R2(config)# router ospf 1
R2(config-router)# router-id 2.2.2.2
R2(config-router)# network 20.0.0.0 0.255.255.255 area 1
R2(config-router)# network 30.0.0.0 0.255.255.255 area 0
R2(config-router)# exit.

Router 3:

R3(config)# router ospf 1
R3(config-router)# router-id 3.3.3.3
R3(config-router)# network 30.0.0.0 0.255.255.255 area 0
R3(config-router)# network 40.0.0.0 0.255.255.255 area 2
R3(config-router)# exit

→ To keep the routers Active we have to configure interface loopback

Router 1:

R1(config-if)# interface loopback 0
R1(config-if)# ip address 172.16.1.252 255.255.255.0
R1(config-if)# no shutdown

Router 2:

R2(config-if)# interface loopback 0
R2(config-if)# ip address 172.16.1.253 255.255.255.0
R2(config-if)# no shutdown.

Router 3:

R3(config-if)# interface loopback 0
R3(config-if)# ip address 172.16.1.254 255.255.255.0
R3(config-if)# no shutdown

→ Create a virtual link b/w R1, R2 by this we can create a virtual link to connect to area 0.

Router R1:

R1(config)# router ospf 1
R1(config-router)# area 1 virtual-link 2.2.2.2

Router R2:

R2(config)# router ospf 1
R2(config-router)# area 1 virtual-link 1.1.1.1
R2(config-router)# exit

Finally, After creating virtual link, show ip route for all routers.

Result:

PC> ping 40.0.0.10

pinging 40.0.0.10 with 32 bytes of data

Request timed out
Reply from 40.0.0.10: bytes=32 time=10ms TTL=125
Reply from 40.0.0.10: bytes=32 time=2ms TTL=125
Reply from 40.0.0.10: bytes=32 time=9ms TTL=125

ping statistics for 40.0.0.10:
Packets: Sent=4, Received=3, Lost=1 (25% loss),
Approximate round-trip in milli seconds
Minimum = 2ms, Maximum = 10ms, Average = 7ms.

→ Create a virtual link b/w R1, R2 by this we can create a virtual link to connect to area 0.

Router R1:

R1(config)# router ospf 1
R1(config-router)# area 1 virtual-link 2.2.2.2

Router R2:

~~R2(conf)~~
R2(config)# router ospf 1
R2(config-router)# area 1 virtual-link 1.1.1.1
R2(config-router)# exit

Finally, After creating virtual ~~##~~ link, show ip route for all routers.

Result:

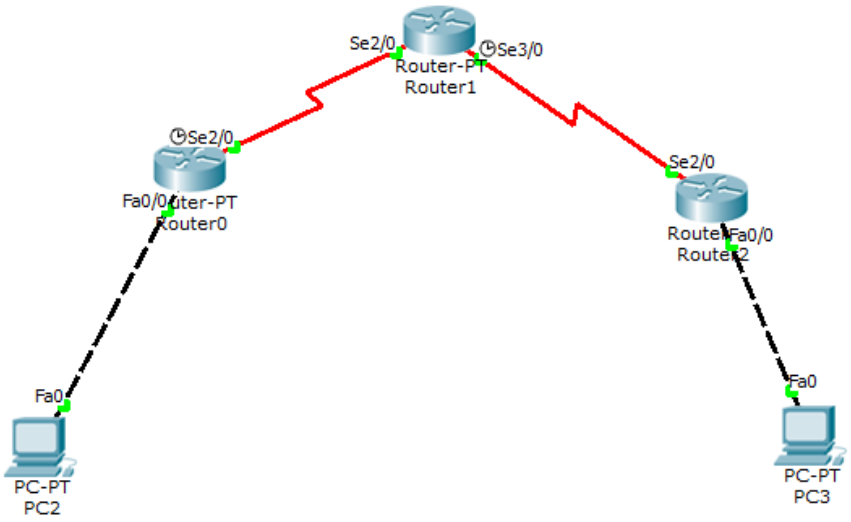
PC> ping 40.0.0.10

pinging 40.0.0.10 with 32 bytes of data

Request timed out
~~Re~~ Reply from 40.0.0.10: bytes = 32 time = 10ms TTL=125
Reply from 40.0.0.10: bytes = 32 time = 2ms TTL=125
Reply from 40.0.0.10: bytes = 32 time = 9ms TTL=125

ping statistics for 40.0.0.10:
~~Pa~~ Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round ~~trip~~ in milli seconds
Minimum = 2ms, Maximum = 10ms, Average = 7ms.

Topology and output screenshots:




```
PC>ping 40.0.0.10

Pinging 40.0.0.10 with 32 bytes of data:

Reply from 40.0.0.10: bytes=32 time=9ms TTL=125
Reply from 40.0.0.10: bytes=32 time=2ms TTL=125
Reply from 40.0.0.10: bytes=32 time=2ms TTL=125
Reply from 40.0.0.10: bytes=32 time=2ms TTL=125

Ping statistics for 40.0.0.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 9ms, Average = 3ms
```