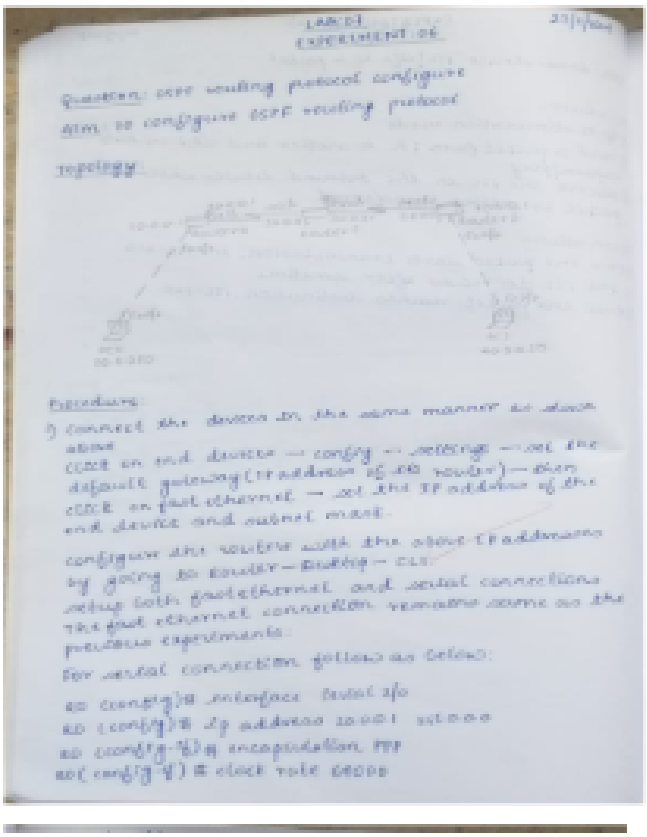
EXPERIMENT-7

Question 7:

Configure OSPF routing protocol

Observation :



R1(config-if)# no shutdown

exit.

clock rate command must be written only if the serially connected port shows a (clock) symbol.

Here we write clock rate command for R0 serial 2/0, R1 serial 2/0.

After these steps all the connections must have turned green.

5) To enable IP routing by configuring OSPF routing protocol in all the routers

Router R0—CLI

R0(config)# router ospf 1

R0(config-router)# router-id 1.1.1.1

R0(config-router)# network 10.0.0.0 0.255.255.255 area 0

R0(config-router)# network 20.0.0.0 0.255.255.255 area 0

R0(config-router)# exit

Router R1—CLI

R1(config)# router ospf 1

R1(config-router)# router-id 2.2.2.2

R1(config-router)# network 20.0.0.0 0.255.255.255 area 0

R1(config-router)# network 30.0.0.0 0.255.255.255 area 0

R1(config-router)# exit.

Router R2—CLI

R2(config)# router ospf 1

R2(config-router)# router-id 3.3.3.3

R2(config-router)# network 30.0.0.0 0.255.255.255 area 0

R2(config-router)# network 40.0.0.0 0.255.255.255 area 0

R2(config-router)# exit

6) Once the setting up of networking area is done we configure loopback address to router

R0(config-if)# interface loopback0
R0(config-if)# ip add 192.16.2.252 255.255.0.0
R0(config-if)# no shutdown

R1 (config-if)# interface loopback0
R1 (config-if)# ip add 192.16.1.253 255.255.0.0
R1 (config-if)# no shutdown

R2 (config-if)# interface loopback0
R2 (config-if)# ip add 192.16.1.254 255.255.0.0
R2 (config-if)# no shutdown

3) On checking routing table of R2 using show ip route we can see that R2 does not know about area 3 gateway of last resort is not set

O IA 10.0.0.0/8 [110/128] via 30.0.0.1 serial 2/0
C 40.0.0.0/8 is directly connected, fastethernet 0/0
C 30.0.0.0/8 is directly connected, serial 2/0

Since R2 doesn't know about area 3 we have to create a virtual link between R0 and R1

4) Creating virtual link between R1, R0

In Router R0
R0(config)# router ospf 1
R0(config-router)# area 1 virtual-link 2.2.2.2
R0(config-router)# exit

In Router R1
R1 (config)# router ospf 1
R1 (config-router)# area 1 virtual-link 1.1.1.1
R1 (config-router)# exit

5) Now check routing table for R2

Once all these steps are completed, the message can be pinged from 1 end device to other.

Observations

1. In R2
show ip route
O IA 20.0.0.0/8 [110/129] via 30.0.0.1 00:17:21 serial 2/0
C 40.0.0.0/8 is directly connected, fastethernet0/0
O IA 10.0.0.0/8 [110/129] via 30.0.0.1 00:17:21 serial 2/0
C 30.0.0.0/8 is directly connected, serial 2/0
C 192.16.0.0/16 is directly connected, loopback0

Similarly output for R0 and R1

2. Ping output
from PC0 to PC1
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=11ms TTL=125
Reply from 40.0.0.10: bytes=32 time=1ms TTL=125
Reply from 40.0.0.10: bytes=32 time=22ms TTL=125
Reply from
Pinging statistics for 40.0.0.10
Packets: sent=4, Received=3, lost=1 (25% loss)

Screenshot of the output:

```
C    10.0.0.0/8 is directly connected, FastEthernet0/0
     20.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       20.0.0.0/8 is directly connected, Serial2/0
C       20.0.0.2/32 is directly connected, Serial2/0
O    30.0.0.0/8 [110/128] via 20.0.0.2, 00:05:09, Serial2/0
O IA 40.0.0.0/8 [110/129] via 20.0.0.2, 00:05:09, Serial2/0
C    172.16.0.0/16 is directly connected, Loopback0
```

```
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=6ms TTL=125
Reply from 40.0.0.10: bytes=32 time=7ms 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 times in milli-seconds:
    Minimum = 6ms, Maximum = 9ms, Average = 7ms
```