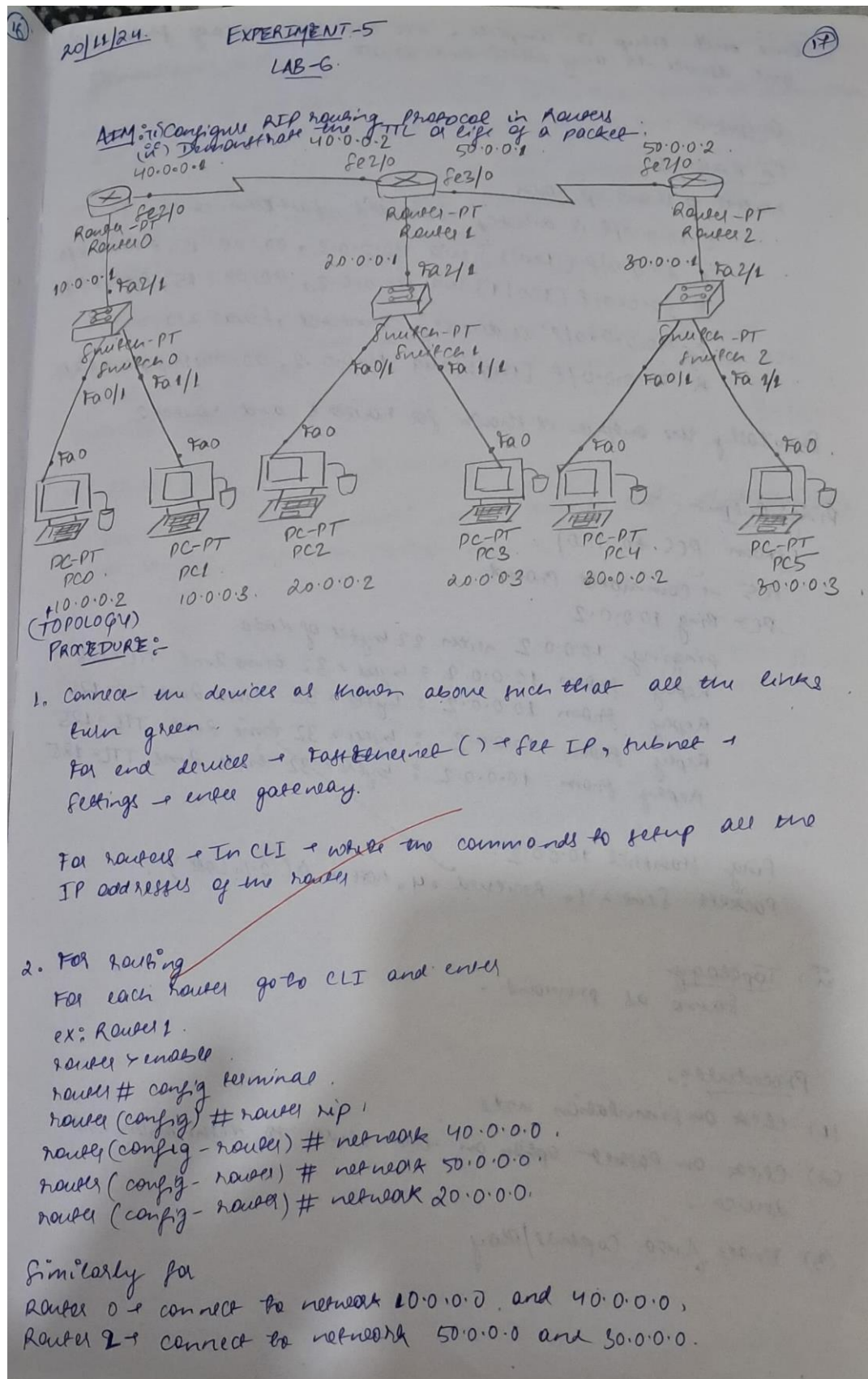# Program 6

Aim: (I) Configure RIP routing Protocol in Routers.
(II) Demonstrate the TTL/ Life of a Packet.

Topology, Procedure and Observation:

20/11/24.   EXPERIMENT-5
                      LAB-6.

AIM:- i) Configure RIP routing Protocol in Routers.
      ii) Demonstrate the TTL or life of a packet.

(TOPOLOGY)

PROCEDURE:-

1. Connect the devices as shown above such that all the links turn green.
   For end devices → FastEthernet () → set IP, subnet → settings → enter gateway.

   For routers → In CLI → write the commands to setup all the IP addresses of the router.

2. For routing
   For each router go to CLI and enter
   ex: Router 1.
   router > enable
   router # config terminal.
   router (config) # router RIP.
   router (config-router) # network 40.0.0.0.
   router (config-router) # network 50.0.0.0.
   router (config-router) # network 20.0.0.0.

Similarly for
Router 0 → connect to network 10.0.0.0 and 40.0.0.0,
Router 2 → connect to network 50.0.0.0 and 30.0.0.0.

3. Once one's setup is complete, one can the message from one device to any other end device.

Output :-

In Rover 0
router # shows ip rows
C 10.0.0/8 is directly connected, fastEthernet 0/0,
R 20.0.0/8 [120/1] via 40.0.0.2, 00:00:15, serial 2/0
R 30.0.0/8 [120/1] via 40.0.0.2, 00:00:15, serial 2/0
C 40.0.0.0/8 is directly connected, serial 2/0.
R 50.0.0.0/8 [120/1] via 10.0.0.2, 00:00:15, serial 2/0.

Similarly the output is shown for router 1 and router 2.

Ping Output
(from PC5 to PC0).
PC5 → command prompt
PC> Ping 10.0.0.2.
pinging 10.0.0.2 with 32 bytes of data.
Reply from 10.0.0.2 : bytes = 32 time 2ms TTL=125
Reply from 10.0.0.2 : bytes = 32 time 2ms TTL=125
Reply from 10.0.0.2 : bytes = 32 time 2ms TTL=125
Reply from 10.0.0.2 : bytes = 32 time 2ms TTL=125

Ping statistics 10.0.0.2
Packets sent = 4, Recieved = 4, host = 0 (0% Loss).

(ii) Topology.
Same as previous -

Procedure :-

(1) Click on simulation node

(2) Click on Packet option on the source to destination end device.

(3) Enter Auto capture/play.

(Time to leave)

Demonstrate a TTL as life of a packet

(4) We can see the packet movement from the source to destination and then acknowledgement flow back to the source.

(5) At each point, we can click on the packet and view the OSI model, Inbound POV details, outbound POV details.

Output :-

(1) We can observe that the TTL starts with 255 and gradually as the packet is being transferred, the TTL reduces finally to 125.

(2) At the end, TTL reduces to 125.

(3) In the simulation panel, under event list, clicking line, we can see where the packet was.

27/10/24

Screen Shots:
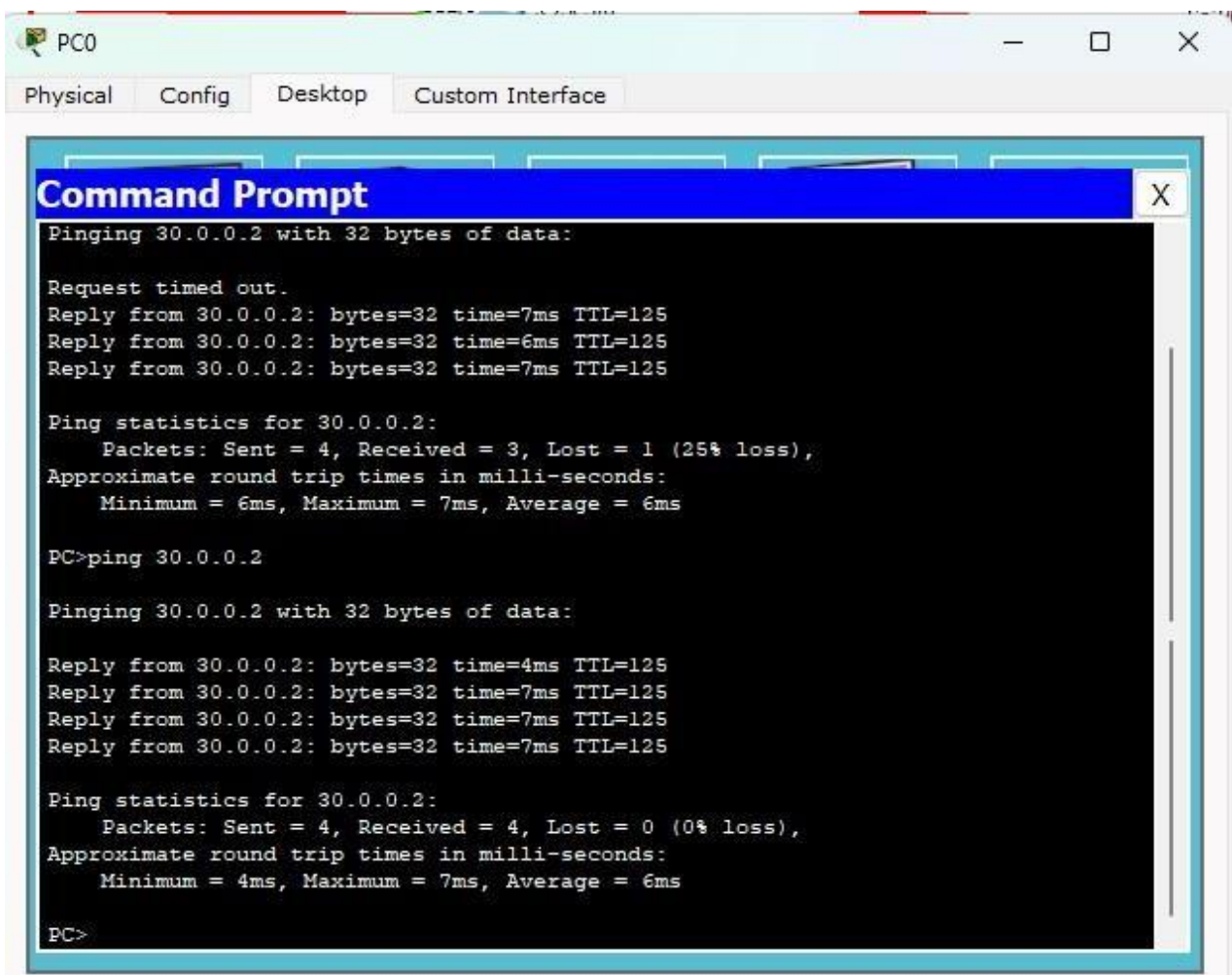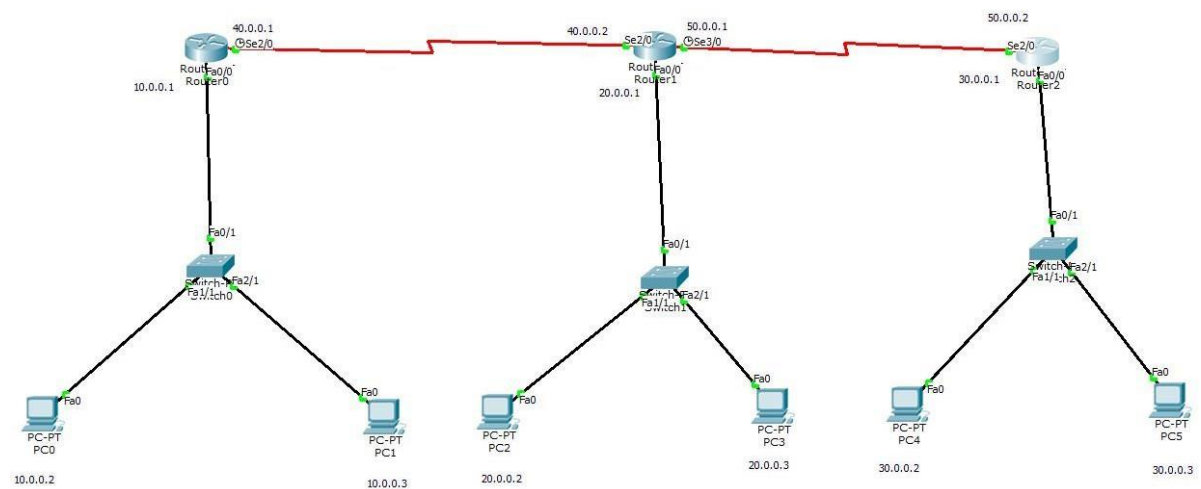
PDU Information at Device: Router0

OSI Model | Inbound PDU Details | Outbound PDU Details

At Device: Router0
Source: PC0
Destination: PC3

In Layers

Layer7
Layer6
Layer5
Layer4
Layer 3: IP Header Src. IP: 10.0.0.2, Dest. IP: 20.0.0.3 ICMP Message Type: 8
Layer 2: Ethernet II Header 000A.41E3.E33A >> 0010.11A0.4697
Layer 1: Port FastEthernet0/0

Out Layers

Layer7
Layer6
Layer5
Layer4
Layer 3: IP Header Src. IP: 10.0.0.2, Dest. IP: 20.0.0.3 ICMP Message Type: 8
Layer 2: HDLC Frame HDLC
Layer 1: Port(s): Serial2/0

1. FastEthernet0/0 receives the frame.

Challenge Me | << Previous Layer | Next Layer >>

PDU Information at Device: Router0

OSI Model | **Inbound PDU Details** | Outbound PDU Details

PDU Formats

Ethernet II

0	4	8	14	19 Byt
PREAMBLE: 101010...1011		DEST MAC: 0010.11A0.4697	SRC MAC: 000A.41E3.E33A	
TYPE: 0x800	DATA (VARIABLE LENGTH)			FCS: 0x0

IP

0	4	8	16	19		31 Bits
4	IHL	DSCP: 0x0		TL: 28		
ID: 0xa			0x0	0x0		
TTL: 255		PRO: 0x1		CHKSUM		
SRC IP: 10.0.0.2						
DST IP: 20.0.0.3						
OPT: 0x0				0x0		
DATA (VARIABLE LENGTH)						

ICMP

0	8	16	31 Bits
TYPE: 0x8	CODE: 0x0	CHECKSUM	

PDU Information at Device: Router0

OSI Model | Inbound PDU Details | **Outbound PDU Details**

PDU Formats

HDLC

0	8	16	32	32+x	48+x	56+

FLG: 0111 1110	ADR: 0x8f	CONTROL: 0x0	DATA: (VARIABLE LENGTH)	FCS: 0x0	FLG: 0111 1110

IP

0   4   8   16   19   31 Bits

4	IHL	DSCP: 0x0	TL: 28	
ID: 0xa			0x0	0x0
TTL: 254		PRO: 0x1	CHKSUM	
SRC IP: 10.0.0.2				
DST IP: 20.0.0.3				
OPT: 0x0			0x0	
DATA (VARIABLE LENGTH)				

ICMP

0   8   16   31 Bits

TYPE: 0x8	CODE: 0x0	CHECKSUM
ID: 0x5		SEQ NUMBER: 10