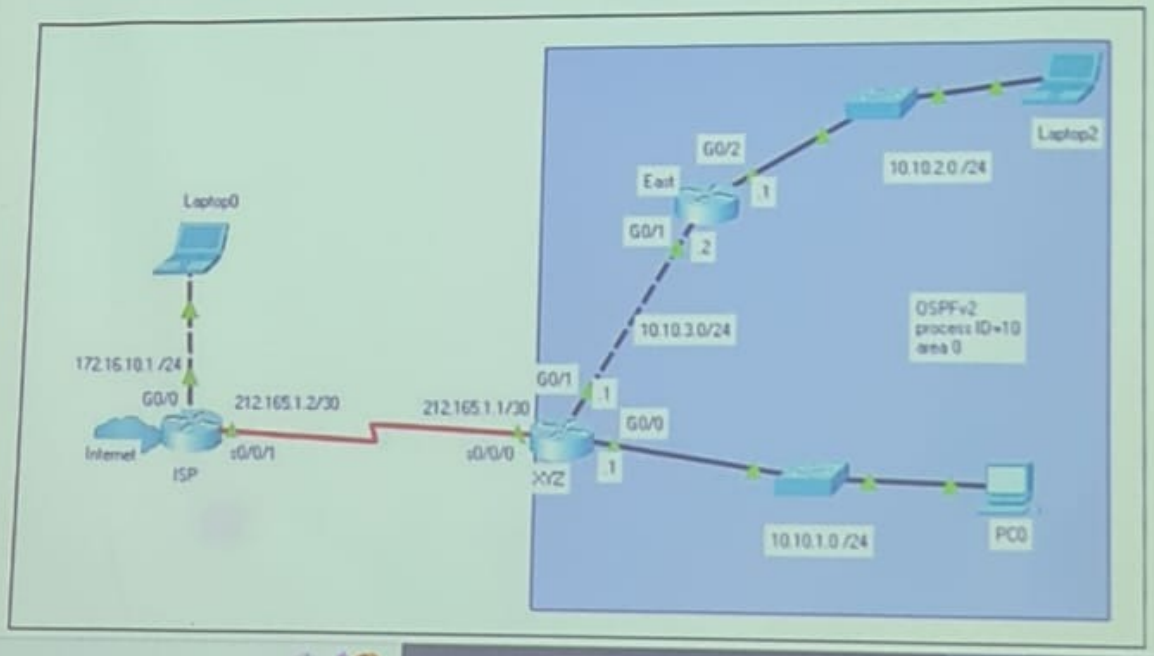
BMIT3094 ADVANCED COMPUTER NETWORK

Question 1

With reference to the network topology shown in Figure 1, write the configurations in the respective routers for connectivity among PC0, Laptop2, Laptop0 and the Internet to function properly.



a) Standard static routes using the next hop IP (Internet Protocol) addresses in the respective router. Which router to configure the standard static routes? (10 marks)

b) A Default route using the next hop IP addresses in the respective router. Which router to configure the default route? (5 marks)

c) (i) OSPFv2 (Open Shortest Path First v2) configurations for the XYZ and East routers using network commands with process ID 10 and area 0 for connectivity among PC0, Laptop2, Laptop0 and the Internet. (15 marks)

(ii) Propose the passive interface configurations for respective routers shown in Figure 1. (6 marks)

d) From the network topology in Figure 1, answer the following questions:

(i) Draw and label an extra serial connection from East to ISP routers with the network address 212.1.1.0 and subnet mask /30. Make assumption for the serial numbering and the IP addresses from 212.1.1.0 /30 to be assigned for the serial connections. (5 marks)

(ii) Based from Q1d)(i), suggest a Floating default route as a backup path using an exit interface. Justify the needs of a floating default route. (9 marks)

[Total: 50 marks]

a.

ISP router

ip route 10.10.2.0 255.255.255.0 212.165.1.1
ip route 10.10.1.0 255.255.255.0 212.165.1.1

if need to forward all the network, then have to include this command as well:
ip route 10.10.3.0 255.255.255.0 212.165.1.1

b.

XYZ

ip route 0.0.0.0 0.0.0.0 212.165.1.2

c.

XYZ

router ospf 10
network 10.10.1.0 0.0.0.255 area 0
network 10.10.3.0 0.0.0.255 area 0
default-information originate
passive-interface g0/0
** passive-interface s0/0/0

East

router ospf 10
network 10.10.2.0 0.0.0.255 area 0
network 10.10.3.0 0.0.0.255 area 0
passive-interface g0/2

d.

(i) draw it out
/30 = 4 host (2 usable host - .1 is for network address and .4 is broadcast address)
ISP - s0/0/0 (212.1.1.2)
Edge - s0/0/1 (212.1.1.3)

(ii)

ip route 0.0.0.0 0.0.0.0 s0/0/1 88
A floating default route is to be used as a backup default route if the primary default route fails.
A higher administrative distance has to be specified.

Question 2

a) (i) Consider an online banking system in which users provide a password and account number for account access. Give examples of confidentiality, integrity and availability requirements associated with the online banking system. (6 marks)

(ii) Suggest and briefly explain **TWO (2)** types of security attacks that may affect the online banking system. (6 marks)

b) (i) Analyze Figure 2-1 and write an access list numbered 5 to allow PC-B to telnet into Router R2. Deny all other telnet traffic to R2. Use suitable keyword(s) in your ACL (Access Control List). Indicate the router, interface and direction to apply the ACL. (10 marks)

a.
(i)
C - encryption algorithms
I - hashing algorithms
A - alternative server

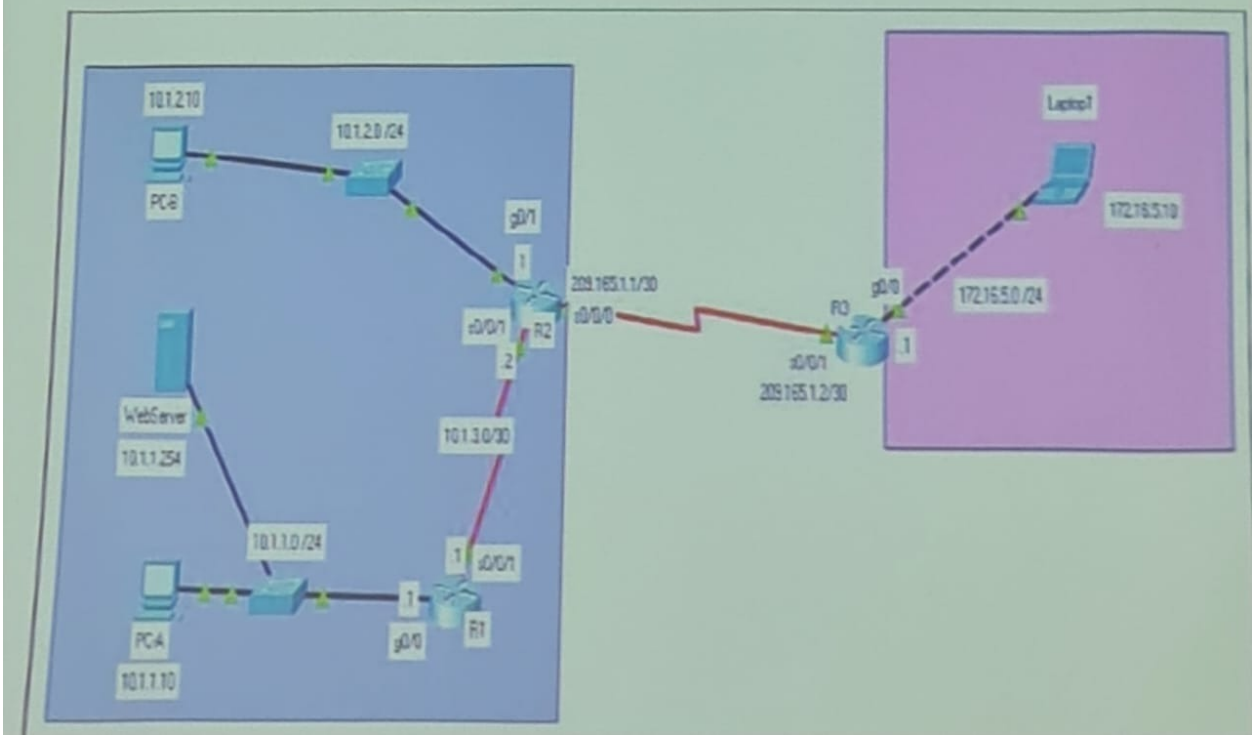
(ii)
DDos - Flood and interrupt the network services to user, device and applications. For example, the threat actor sends an enormous quantity of data at a rate that the network, host, application cannot handle. This causes transmission and response time to slow down or even clash the device and service.
Ransomware - denies user access by encrypting the files until user pay the random, normally in cryptography (Bitcoin) in order to regain access to the computer files

b.
(i)
Router - R2
Interface - line vty 0 4
Direction - In

access-list 5 permit host 10.1.2.10
access-list 5 deny any

line vty 0 4
access-class 5 in

(ii) Analyze Figure 2-1 and write an extended access list called **Web** to allow Laptop1 to access the WebServer via HTTP. Laptop1 is allowed to ping lower half of the 10.1.2.0/24 network. Deny all other traffic from Laptop1. Use suitable keyword(s) in your ACL. Indicate the router, interface and direction to apply the ACL. **(16 marks)**



Router 3
g0/0
in

ip access-list extended Web
permit tcp host 172.16.5.10 host 10.1.1.254 eq 80
permit icmp host 172.16.5.10 10.1.2.0 0.0.0.127
deny ip any any

int g0/0
ip access-group Web in

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Question 2 (Continued)

c) Analyze Figure 2-2 and write an extended access list numbered 105 to block PC2 from receiving information from first 63 usable addresses from 172.50.25.0/24 network. Permit all other traffic. Use suitable keyword(s) in your ACL. Indicate the router, interface and direction to apply the ACL.
(12 marks)

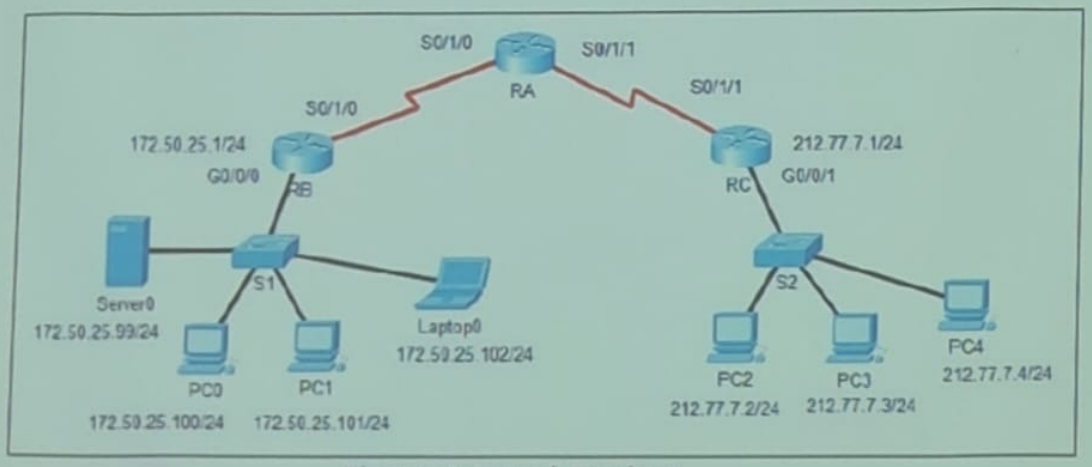

Figure 2-2: Network Topology

[Total: 50 marks]

access-list 105 deny ip 172.50.25.0 0.0.0.63 host 212.77.7.2
access-list 105 permit ip any any

int g0/0/0
ip access-group 105 in

router - RB
g0/0/0
in