

## A. TEST (Thu)

### I. Final exam (TTX system)

Question 1:

- a. Draw a network diagram for a 6-storey building, 4 rooms/floor, 1 network every 2 floors, with Wifi connection support.  
The building's network has 2 internet connections. Assign IP addresses to each Network and network cards of each router?
- b. Write down the Routing Table contents of each Router?

Question 2:

- a. What problem does overloading NAT solve? What problem does overloading NAT solve? Draw an illustration.
- b. What are the applications of VPN?
- c. What is the difference between non-persistent and persistent HTTP?

Question 3:

- a. Describe the operating principle of CSMA/CD method?
- b. Give an example to illustrate the algorithmic idea of a Distance Vector routing protocol?

Question 4:

- a. Tell me how to stay anonymous on the Internet?
- b. What is the function of Firewall? How is Firewall different from Proxy? Does Firewall have virus scanning function? or not?
- c. What are the protocols for sending/receiving mail?

Question 5:

- a. Explain the meaning of the numbers and letters in the names of the following LAN technologies: 10Base2, 10Base5, 100BaseTXm 1000BaseTX, 100BaseFX?
- b. Describe how to crimp UTP cables according to T568A and T568B standards, and show how to use the two standards. press that wire?
- c. Explain the difference between Hub and Switch?

Question 6:

- a. What is the idea of TCP to solve the problem of packet damage and packet loss?
- b. Given an 8-bit data string: 10111111, calculate the checksum of that bit string?

II. Midterm exam 2020 - 2021

Question 1: Divide the address 203.162.48.128/26 into 6 subnets?

Question 2: When should we write network applications using TCP and when should we write network applications using UDP?

Question 3: Draw a diagram of name resolution to IP address: [www.mathdept.mit.edu.vn](http://www.mathdept.mit.edu.vn)?

Question 4: What is the principle of overcoming the blocking of access to a website?

Question 5: What are the uses of Switch and Router?

Question 6: Describe the meaning of the two sublayers LLC and MAC of the Data Link layer?

## III. Final exam 20 – 21 (90 minutes)

Question 1: (2 points)

- a. Give an example of a sequence of 18 bits of data and calculate the checksum for that sequence of bits? b. According to the checksum method, how does the receiver know if the received sequence of bits is correct or incorrect? Illustration equal to the 18 bit string and checksum in part a?
- c. Describe the characteristics and functions of Repeater, Modem, Hub, Bridge, Switch, Router? d. State the functions of specific protocols in the TCP/IP model.

Question 2: (2 points)

- a. Describe the functions of the components in Mail Server? b. What is the difference between POP and IMAP?
- c. Why do DHCP and DNS use UDP?
- d. Describe the principle of DNS service configuration, give an example, with subdomain?

Question 3: (2 points)

- a. Describe the function of each layer in the OSI model and what problems it solves in a process. media?
- b. Indicate the delay in sending packets from a machine in network 1 to network 2, 2 networks These are connected by 2 routers (illustration)?
- c. What is the function of Firewall? Distinguish between soft and hard Firewall? Difference between Firewall and Proxy?

Question 4: (2 points)

Draw a network diagram for a company that satisfies the following conditions:

- There are 2 buildings, each building is a network, each building has 6 floors.
- Each floor has 5 rooms, each room has 20 computers.
- Each building's network has its own Firewall.
- Have Internet connection.
- Supports wifi connection.
- The company has 2 servers that allow direct access to the Internet - Assign IP addresses to networks and servers?

How many collision domains and broadcast domains does the network have?

Question 5: (2 points)

a. Give an example of a network system with 8 networks and 6 routers. Write down the routing table contents of the 6 networks.

That router allows 8 networks to communicate?

b. Describe the operating principles of CDistance Vector and Link State routing?

#### IV. Final exam 19-20 (60 minutes)

Question 1: (1.5 points)

a. Indicate what problems each layer in the OSI model solves in the communication process.

network?

b. Describe the correlation between each layer in the TCP/IP protocol model and the OSI model?

Question 2: (1.5 points)

a. Divide 172.29.64.0/21 into 2 subnets with 500 IPs, 1 subnet with 100 IPs, 2 subnets with 50 IPs? b. Divide

203.168.30.0/25 into 2 subnets with 30 IPs, 1 subnet with 20 IPs, 2 subnets with 10 IPs?

Question 3: (1.5 points)

a. What protocol does Gmail use to send and receive mail? b. What

are the advantages and disadvantages of using Gmail and mail client software like MS Outlook to receive mail?

send email?

Question 4: (1.5 points)

a. Describe the process of resolving [www.fit.mit.edu.vn](http://www.fit.mit.edu.vn) into an IP address on the computer. b. What is the

reason for refusing access to a blocked website? Show how to overcome the ban.

there?

Question 5: (1.5 points)

a. What is the idea of TCP to solve the problem of packet damage and packet loss? b.

What are the characteristics of network applications that should use UDP?

Question 6: (1.5 points)

a. What problem does Overloading NAT (outgoing NAT) solve? Draw a picture to illustrate an example of Overloading.

NAT, which records the IP address, port of the packets and connects to the NAT table?

b. What problem does Overlapping NAT solve? Draw an example to illustrate Overlapping.

NAT, which records the IP address, port of the packets and connects to the NAT table?

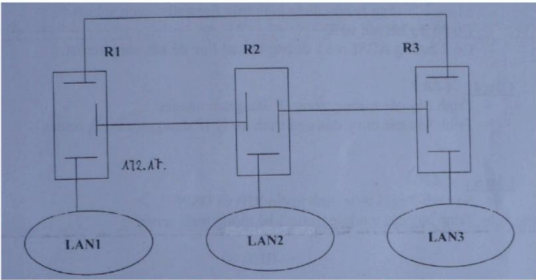
Question 7: (1 point)

Draw a network diagram with 6 networks, using 4 routers and 6 switches. Assign IP addresses to the networks and router?

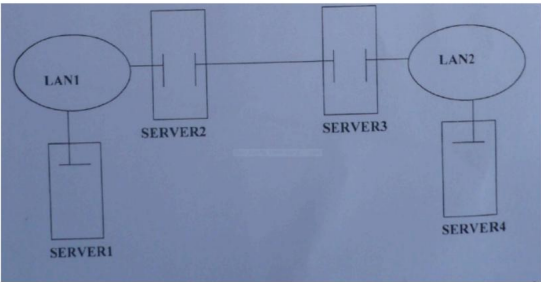
V. Final exam 1 (90 minutes)

Question 1: (2 points)

Set IP address and write routing table content of each router R1, R2, R3



Question 2: (2 points)



- a. Set your own IP address and write packet filter rules to prohibit machines in LAN1 from accessing the web. fpt, mailserver at SERVER4.
- b. Still keeping the packet filter rules as in question 1, propose a solution for SERVER1 to access the web and mail. server at SERVER4.

Question 3: (2 points)

Draw a network diagram for a company according to the following needs:

- There are 2 buildings A and B. Building A has 5 floors, B has 4 floors. Each floor has 5 rooms. Each room has 20 machines.

The company has 3 servers.

- Each building is a separate network.
- This company's network uses firewall screen subnet architecture.
- Supports wifi connection/ -

Has 2 ADSL lines and 1 leased line to connect to the internet.

Question 4: (2 points)

- Display the fields in the IP datagram header
- Describe the steps of IP datagram processing in a router.

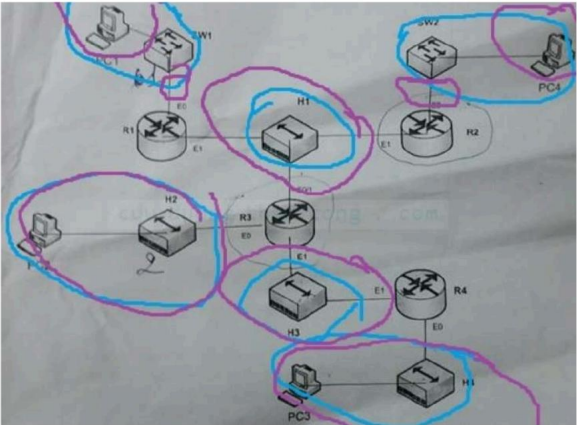
Question 5: (2 points)

- Compare the two routing protocols RIP and OSPF? b.

Describe the modules in a mail server system?

VI. Final exam 2 (90 minutes)

Question 1: (3 points)



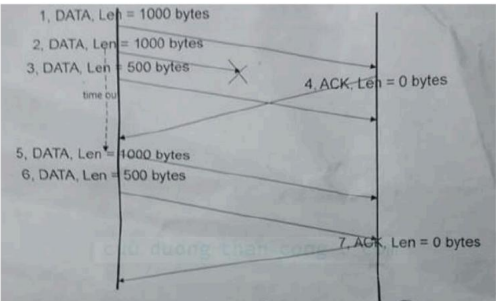
- a. Set IP addresses for computers and routers' network cards yourself (redraw the network diagram with the IP address on exam paper)?
- b. Write down the routing table contents of routers R1, R2, R3, R4 so that all PC1, PC2, PC3 and PC4 connected?
- c. How many collision domains and broadcast domains does the above network system have?

Question 2: (2 points)

- a. Divide 178.90.64.0/21 into 2 subnets with 500 IPs, 1 subnet with 100 IPs, 2 subnets with 50 IPs?
- b. Divide 192.48.24.0/25 into 2 subnets with 30 IPs, 1 subnet with 20 IPs, 2 subnets with 10 IPs?

Question 3: (1 point)

Host A exchanges data with host B as shown below (note: 1, 2, 3, 4, 5, 6, 7 is the order of packets)



Knowing that at the time A sent packet number 1 to B, A had sent data up to the 152nd byte and received up to the 4th byte. 34 from B sent; B sent data up to byte 34 and received data from A up to byte 152. Please indicate the Seq Number, ACK Number parameters in each packet?

Question 4: (2 points)

- a. What problem does Overloading NAT (outgoing NAT) solve? Draw a picture to illustrate an example of Overloading.

NAT, which records the IP address, port of the packets and connects to the NAT table?

- b. What problem does Overlapping NAT solve? Draw an example to illustrate Overlapping.

NAT, which records the IP address, port of the packets and connects to the NAT table?

Question 5: (2 points)

Take the network diagram in question 1 with routers R1 – R4 now being Windows server 2003 machines. use network cards and are also named E0 and E1. The network diagram is addressed as in part a of question 1.

- a. Write down packet filter rules on router R1 (must determine on which network card E0 or E1, inbound or ourbound) to prohibit PC1 from accessing web server and ftp server services on PC4?
- b. Keeping the same packet filter rule as question 1, please indicate the solution so that PC1 can access get web server service on PC4? Explain why?



## VII. Final exam number 3 (120 minutes)

Question 1: (2 points)

Draw a network diagram for a 6-storey building with the following requirements:

- Each floor is a network - Internet connection using ADSL - Each floor has 6 rooms, 20 computers, rooms - The building supports wifi connection
- Firewall applied
- Automatically assign IP addresses to machines

Question 2: (2 points)

- a. Partition the address 103.48.0.0/16 into 6 subnets?
- b. Partition the address 190.29.64.0/255.255.192.0 into 6 subnets?
- c. Describe the steps to resolve the name [www.fit.mit.edu](http://www.fit.mit.edu) to an IP address.
- d. Describe the concepts of DNS Forwarder and Catching

Question 3: (1.5 points)

- a. Describe the structure of Ethernet Frame? b. Draw a diagram and explain the CSMA/CD transmission line access method

Question 4: (1.5 points)

- a. Describe the IP datagram processing process in a router?
- b. What is a routing protocol? What are the two ways to classify IP routing protocols?

Question 5: (1.5 points)

- a. Describe the procedure for closing and opening a TCP connection? b. Describe the flow control mechanism of TCP, draw an illustration?

Question 6: (1.5 points)

Describe 3 basic firewall architectures. State the advantages and disadvantages of each architecture.

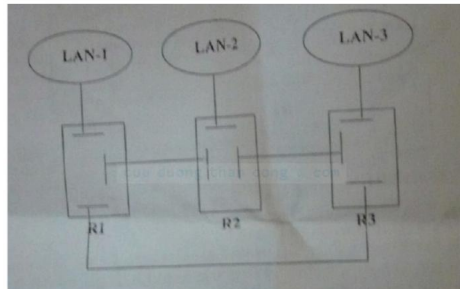
c.

## VIII. Final exam 4 (90 minutes)

Question 1: (2 points)

Given the network diagram as shown:

- Automatically assign IP addresses to networks and each network card in routers.
- Write down the routing table content in each router to ensure all networks are connected?



Question 2: (2 points)

- a. Describe the IP datagram processing process in a router? b.

Describe the 3 basic firewall architectures?

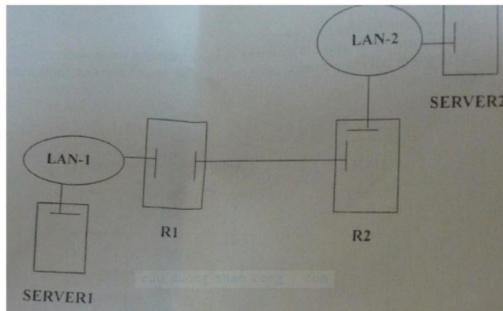
Question 3: (2 points)

Design a network diagram for a building of a unit according to the following requirements:

- The building has 6 rooms/floor, 20 PCs/room. There are 3 servers, SERVER1 is DNS and mail server; SERVER2 is a web server; SERVER3 is a file and database server.
- 6 floors divided into 3 networks, 2 floors/network and has 1 perimeter network.
- Connect to the internet with 2 ADSL lines and wifi connection support.
- Has firewall.

Question 4: (2 points)

For the network system as shown:



Automatically assign IP addresses to each network card.

- a. Write down packet filter rules on R1 to prevent machines in LAN1 from accessing web services.  
mail and DNS on SERVER2, except machine R1.
- b. How should R2 be configured so that SERVER1 can access the web service on SERVER2?  
Do not omit the rules in sentence a.

Question 5: (2 points)

- a. Present solutions to connect SHIPS that are far apart?
- B. Describe the basic steps for configuring a client-to-gateway VPN?