



MALAYSIAN INSTITUTE OF INFORMATION TECHNOLOGY

**FINAL EXAMINATION
JANUARY 2016 SEMESTER**

SUBJECT CODE : INB23604
SUBJECT TITLE : ROUTING PROTOCOLS AND CONCEPTS
LEVEL : BACHELOR
TIME / DURATION : 2.00 pm – 4.30 pm
(2 1/2 HOURS)
DATE : 22 May 2016

INSTRUCTIONS TO CANDIDATES

1. Please read the instructions given in the question paper CAREFULLY.
2. This question paper is printed on both sides of the paper.
3. This question paper consists of ONE SECTION: SECTION A.
4. Answer ALL questions in SECTION A.
6. Please write your answers on the answer booklet given.
7. Answer all questions in English.

THERE ARE 9 PAGES OF QUESTIONS, INCLUDING COVER PAGE.

SECTION A (Total: 100 marks)**INSTRUCTION: Answer ALL questions.****Please use the answer booklet provided.****Question 1:**

- a. State **THREE (3)** network devices used in setting up a LAN. (3 marks)
- b. Write an appropriate configuration commands that will configure interface F0/0 of the router with two subinterfaces to provide inter-VLAN routing using 802.1q encapsulation. Use 10.10.10.0/24 for VLAN 10 and 20.20.20.0/24 for VLAN 20. (4 marks)
- c. i. Define the type of link on a switch is a member of only one VLAN. (2 marks)
- ii. You want to change from the default of VLAN 1 to VLAN 4 for untagged traffic. State the command that you use. (2 marks)
- iii. Describe how Cisco Switch trunking provide for network connectivity. (2 marks)

d. For Question d(i) to d(iv), refer to Figure 1.

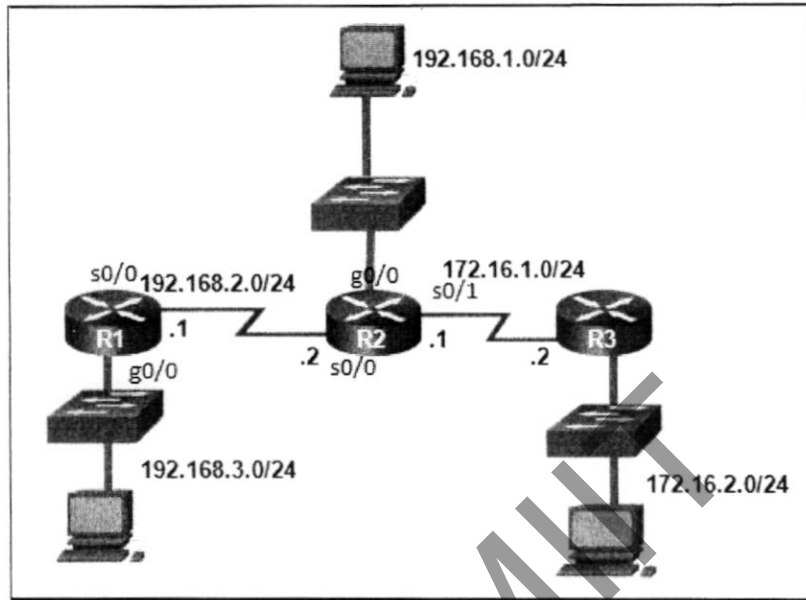


Figure 1 : Network Topology

- i. Write the contents of the routing table for R1. (5 marks)
- ii. List the network/s that is/are directly connected to the R2 (3 marks)
- iii. Write the command used to configure a static route to network 172.16.2.0 by specifying the next-hop IP address on R1. (2 marks)
- iv. State another name representing network 192.168.1.0/24 (2 marks)

[25 marks]

Question 2:

- a. For Question a(i) to a(iii) refer to Figure 2 which illustrates the routing between routers on the Internet using OSPF.

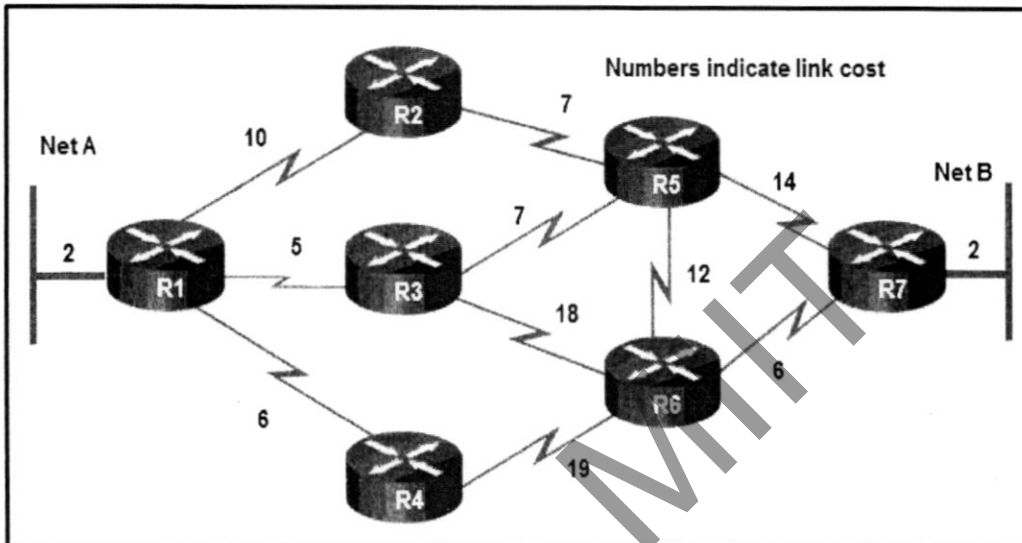


Figure 2: Network Topology

- i. State the advantage of using OSPF as the routing protocol. (2 marks)
 - ii. Identify the path that will be chosen by OSPF to send data packets from Net A to Net B. (2 marks)
 - iii. In the event R6 down, which route OSPF will use to forward packet from Net A to Net B. (2 marks)
- b. A router can learn about remote network in 2 ways which by dynamically and statically (manual).
- i. List **TWO (2)** conditions which are advisable to use static route. (4 marks)
 - ii. List **TWO (2)** advantages of configuring Static route in a network. (4 marks)

- c. For question c(i) to c(iii) refer to Figure 3.

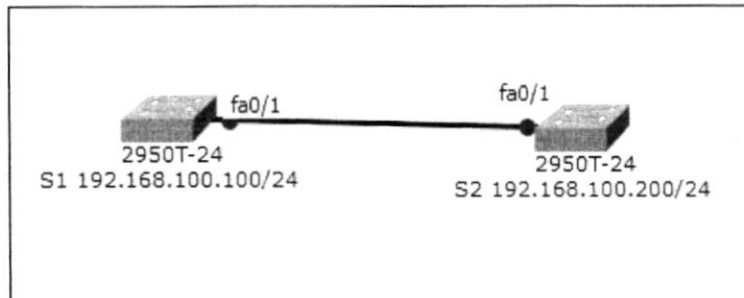


Figure 3: Network Topology

Azmi is configuring two old version switches (S1 and S2) connecting each other via FastEthernet0/1 interfaces using UTP straight cable. The IP address of S1 is 192.168.100.100/24 and the IP address of S2 is 192.168.100.200/24. When PING command is issued from S1 to S2, the result shows that S2 is unreachable.

- i. Write the command used to ping from S1 to S2. (2 marks)
 - ii. Give **ONE (1)** possible factor that causes the S2 to be unreachable. (2 marks)
 - iii. Identify the updated technology implemented by Cisco to solve possible problem mentioned in answer c(ii). (2 marks)
- d. Differentiate between the function of switch and router. (4 marks)
- e. List **ONE (1)** service that can be used to remotely access a switch using CLI. (1 mark)

[25 marks]

Question 3:

- a. For question a(i) to a(iii) refer to Figure 4.

```
<output omitted>
!
interface GigabitEthernet0/0
  no ip address
  duplex auto
  speed auto
!
interface GigabitEthernet0/0.15
  encapsulation dot1Q 15
  ip address 172.16.15.254 255.255.255.0
!
interface GigabitEthernet0/0.30
  encapsulation dot1Q 30
  ip address 172.16.3.254 255.255.255.0
!
interface GigabitEthernet0/0.45
  encapsulation dot1Q 45
  ip address 172.16.45.254 255.255.255.0
!
<output omitted>
```

Figure 4 : Router Configuration

- i. Figure 4 shows the router is using router on stick protocol to create the VLANs. Give **ONE (1)** advantage of using Router on Stick. (2 marks)
- ii. State the number of VLANs has been created in the router configuration. (2 marks)
- iii. List the VLANs created in answer a(ii). (3 marks)
- b. List **THREE (3)** advantages of VLAN. (6 marks)

- c. Inter-VLAN routing is a process of forwarding network traffic from one VLAN to another using router.
- i. Suggest **ONE (1)** device that can be used to replace router to do inter-VLAN routing. (2 marks)
 - ii. State the advantage of using the device mentioned in c(i). (2 marks)
 - iii. Inter-VLAN routing can be configured in **THREE (3)** methods. List ALL of them. (3 marks)
- d. For Question d(i) to d(iii) refer to Figure 5.

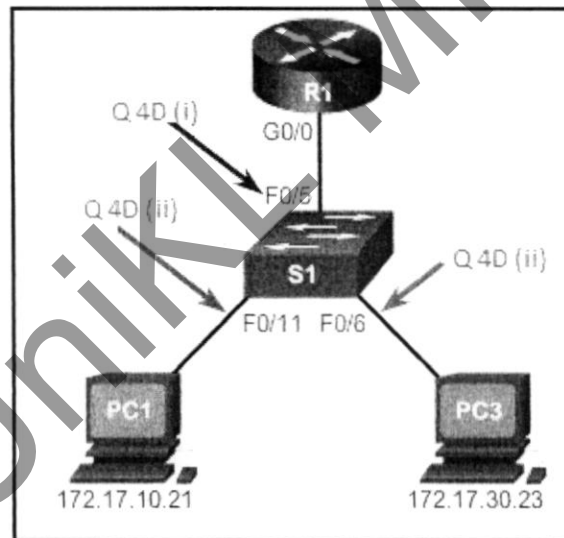


Figure 5 : Network Topology

- i. Determine the trunking protocol should be configured on F0/5 on S1 to enable communication between PC1 and PC3. (2 marks)
- ii. Write the S1 configuration switchport mode should be set for interface F0/6 and Fa0/11 on S1. (2 marks)
- iii. Write a command to test connectivity from PC1 to PC3. (1 mark)

[25 marks]

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Question 4:

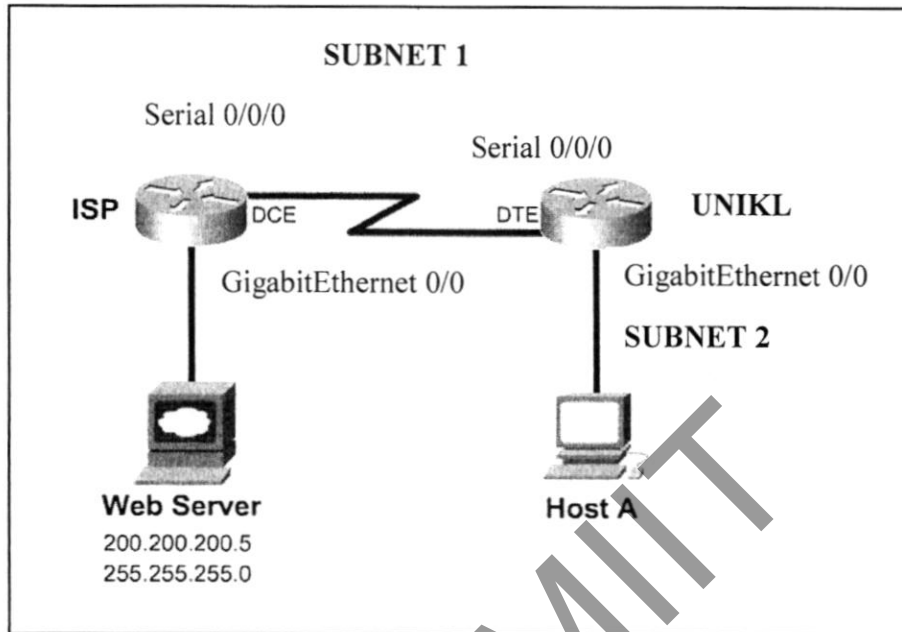


Figure 6: Network Topology

Scenario

Referring to the Figure 6, read very carefully the following statement.

Given a 100.100.100.0/24 address provide four subnets to support at least 20 hosts. The current network requires two of the networks and the other two will be used in the future. Use OSPF and connect to a web server with the IP address of 200.200.200.5. The 200.200.200.0 network is not to be advertised by the ISP router. Use a static route to reach this network.

All routers need to be configured with a hostname and password for console, enables secret and telnet access. Security to the web server hosted by the ISP must be provided. Allow all users access to the HTTP service on the web server. Host A belongs to the web administrator and will need full access including the ability to ping the web server. Deny all users from other networks access to the web server.

By referring to network topology in Figure 6 and the scenario given, you are required to answer all the following questions below:

- a. List all the cables used to attach devices as shown in Figure 6. (2 Marks)

- b. For router UNIKL, write the command to configure the following: (6 Marks)
- Hostname
 - Set enable secret passwords to "miit"
 - Enable telnet access to the routers and use the password "unikl"
- c. The organization has been assigned a class C address, 100.100.100.0 and the network requires four subnets supporting 28 hosts per subnet. List all network address and subnet mask. Show your calculation steps. (6 Marks)
- d. Assign the first usable subnet to the serial link between UNIKL and the ISP. (6 Marks)
- Write the configuration command at interface Serial 0/0/0 on the ISP router with the first usable IP address.
 - Write the configuration command at interface Serial 0/0/0 on UNIKL with the second usable IP address.
 - Assign the second usable subnet to the local network. Write the configurations of Host A with the fifth usable IP address and also the configuration at interface GigabitEthernet 0/0 on UNIKL with the first usable IP address.
- e. Enable the routing protocol. (5 Marks)
- Write the configuration command to enable routing between UNIKL and the ISP using OSPF as the routing protocol. Do not advertise the 200.200.200.0 network on the ISP router.
 - Write the static route configuration on router UNIKL in order to provide connectivity to the web server.

[25 marks]

END OF QUESTIONS