CONFIDENTIAL

MALAYSIAN INSTITUTE OF INFORMATION TECHNOLOGY

# FINAL EXAMINATION

# JANUARY 2016 SEMESTER

| | | |
|---|---|---|
| SUBJECT CODE | : | IKB20603 |
| SUBJECT TITLE | : | ADVANCED NETWORKING |
| LEVEL | : | BACHELOR |
| TIME / DURATION | : | ( 2 ½ HOURS ) 2.00 pm – 4.30 pm |
| DATE | : | 24 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 TWO (2) section, Section A and SECTION B.
4. Answer ALL questions in Section A. Answer THREE(3) questions only in SECTION B.
5. Please write your answers on answer booklet provided.
6. Answer all questions in English.



THERE ARE 8 PAGES OF QUESTIONS, EXCLUDING THIS PAGE.

**SECTION A (Total: 25 marks)**

**INSTRUCTION: Answer ALL questions.**

**Please use the answer booklet provided.**

**Question 1**

Based on Figure 1, answer the following questions.

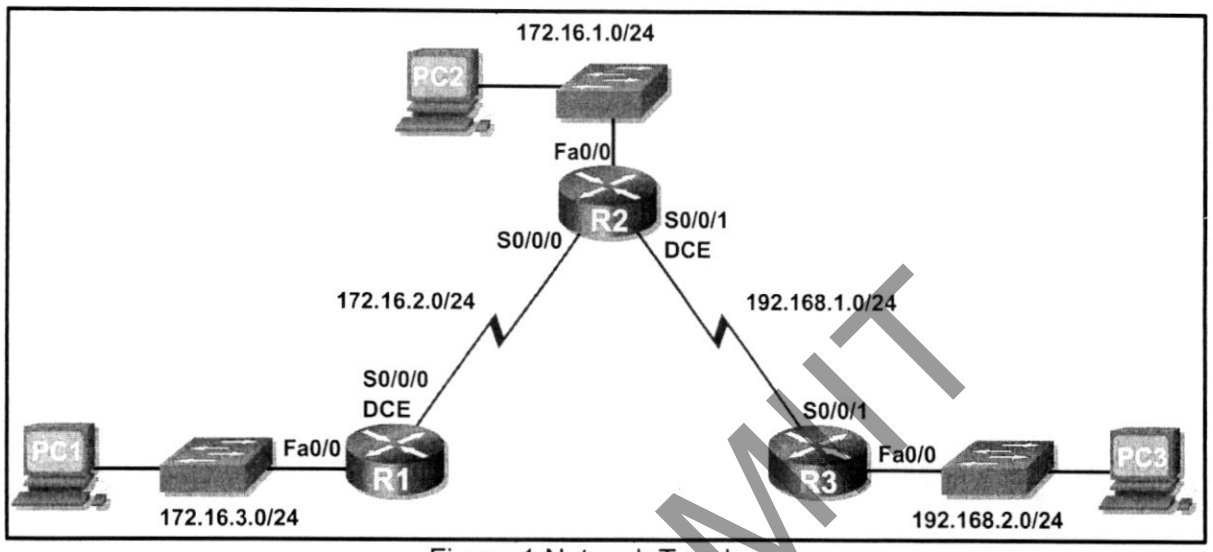


Figure 1 Network Topology

**Table 1 Addressing Table**

| Device | Interface | IP Address | Subnet Mask | Default Gateway |
|---|---|---|---|---|
| R1 | Fa0/0 | 172.16.3.1 | 255.255.255.0 | N/A |
| | S0/0/0 | 172.16.2.1 | 255.255.255.0 | N/A |
| R2 | Fa0/0 | 172.16.1.1 | 255.255.255.0 | N/A |
| | S0/0/0 | 172.16.2.2 | 255.255.255.0 | N/A |
| | S0/0/1 | 192.168.1.2 | 255.255.255.0 | N/A |
| R3 | FA0/0 | 192.168.2.1 | 255.255.255.0 | N/A |
| | S0/0/1 | 192.168.1.1 | 255.255.255.0 | N/A |
| PC1 | NIC | 172.16.3.10 | 255.255.255.0 | 172.16.3.1 |
| PC2 | NIC | 172.16.1.10 | 255.255.255.0 | 172.16.1.1 |
| PC3 | NIC | 192.168.2.10 | 255.255.255.0 | 192.168.2.1 |

(a) Write a series of command to perform basic router configuration on R2. Details are below:

i. Hostname : R2
ii. No ip domain lookup
iii. Enable password : student
iv. Secret password: cisco

v. Console password: cisco123
vi. Virtual terminal password: student123
vii. add logging synchronous command to console and virtual terminal lines
viii. Serial inteface, DCE 64000 and fastethernet interface
ix. Banner : AUTHORIZED PERSON ONLY (12 marks)

(b) Based on the following output, answer the following questions:

```
R2#show ip interface brief
Interface IP-Address OK? Method Status Protocol
FastEthernet0/0 172.16.1.1 YES manual up up
FastEthernet0/1 unassigned YES unset administratively down down
Serial0/0/0 172.16.2.2 YES manual up up
Serial0/0/1 192.168.1.2 YES manual up up
Vlan1 unassigned YES manual administratively down down
```

i. How many interfaces are activated on R1 and R3? (0.5 mark)
ii. There three activated interfaces on R2. Why? (0.5 mark)

(c) On the R3 router, write a command to configure a static route to the 172.16.1.0 network using R2 as exit interface. (2 marks)

(d) Define the purpose to configure logging synchronous in the terminal lines. (2 marks)

(e) On R1, write a series of command to set the interval "no timeout" that the EXEC command interpreter waits until user input is detected. (2 marks)

(f) Based on the following output, answer the following questions:

```
Output from R3:

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, * - candidate default
U - per-user static route, o - ODR
Gateway of last resort is not set
172.16.0.0/24 is subnetted, 1 subnets
S 172.16.1.0 [1/0] via 192.168.1.2
C 192.168.1.0/24 is directly connected, Serial0/0/1
C 192.168.2.0/24 is directly connected, FastEthernet0/0
```

With this route entered in the routing table, any packet that matches the first 24 left-most bits of 172.16.1.0/24 will be forwarded to the next-hop router at 192.168.1.2.

i. State interface that R3 will use to forward packets to the 172.16.1.0/24 network. (1 mark)

ii. Assume that the following packets have arrived at R3 with the indicated destination addresses. Will R3 discard the packet or forward the packet? If R3 forwards the packet, with what interface will R3 send the packet? Write in the following table and fill in the correct answer at Discard/Forward and Interface column. (5 marks)

| Packet | Destination IP | Discard or Forward? | Interface |
|---|---|---|---|
| 1 | 172.16.2.1 | | |
| 2 | 172.16.1.10 | | |
| 3 | 192.168.1.2 | | |
| 4 | 172.16.3.10 | | |
| 5 | 192.16.2.10 | | |

[Total: 25 marks]

SECTION B (Total: 75 marks)

INTRUCTION: **Answer THREE (3) questions ONLY.**

**Please use the answer booklet provided.**

**Question 2**

Based on Figure 2, answer the following questions.

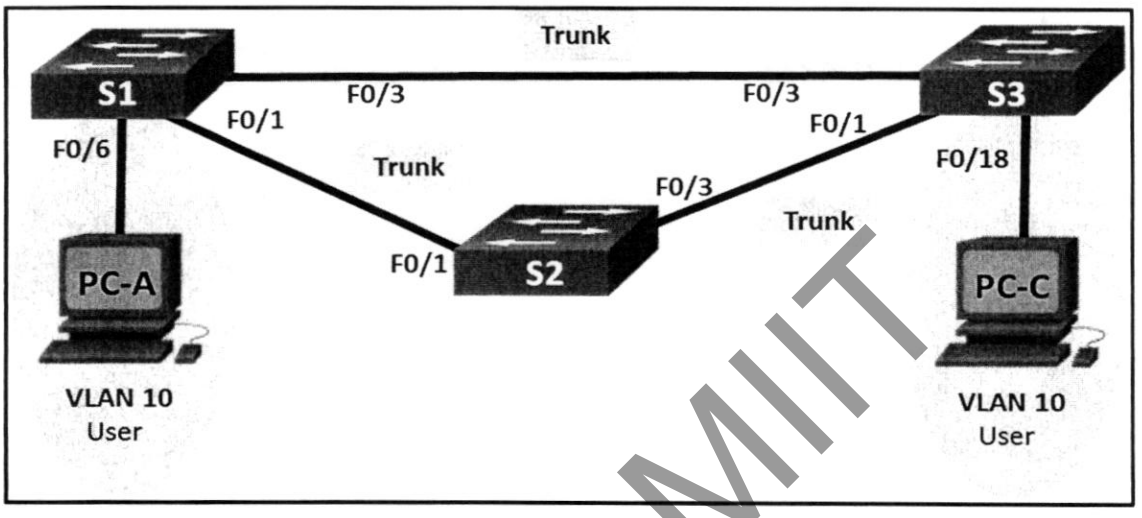


Figure 2 Network Topology

(a) Write a series of command to show the configuration of VLANs, Native VLAN, and Trunks at S1. Name VLAN 10 as User and VLAN 99 as Management. (4 marks)

(b) Write a series of command to enable user ports in access mode and assign VLAN 10 at S1 F0/6 and S3 F0/18. (7 marks)

(c) Write a series of command to configure the trunk ports and assign to native VLAN 99 for port F0/1 and F0/3 at S3. (6 marks)

(d) Define a broadcast storm. How does a broadcast storm develop? (3 marks)

(e) Explain a switching loop and the causes of a switching loop. (3 marks)

(f) By what method that you can mitigate broadcast storms and switching loops caused by introducing redundant switches to your network? (2 marks)

[Total: 25 marks]

**Question 3**

(a) Based on the given information below, design a complete network topology and place the devices at the appropriate levels of the Cisco three-layer hierarchical model design. Please label all the devices and cable. Details are below:

a. One 2911 series router

b. One 3560 switch

c. One 2960 switch

d. Four user workstations (PCs or laptops)

e. One printer (10 marks)

(b) Defined Converged Network. (2 marks)

(c) Describe VTP. (3 marks)

(d) State the benefit of using VTP. (4 marks)

(e) Define redundancy and list **TWO [2]** methods to implement it. (6 marks)

[Total: 25 marks]

**Question 4**

Based on Figure 3, answer the following questions.

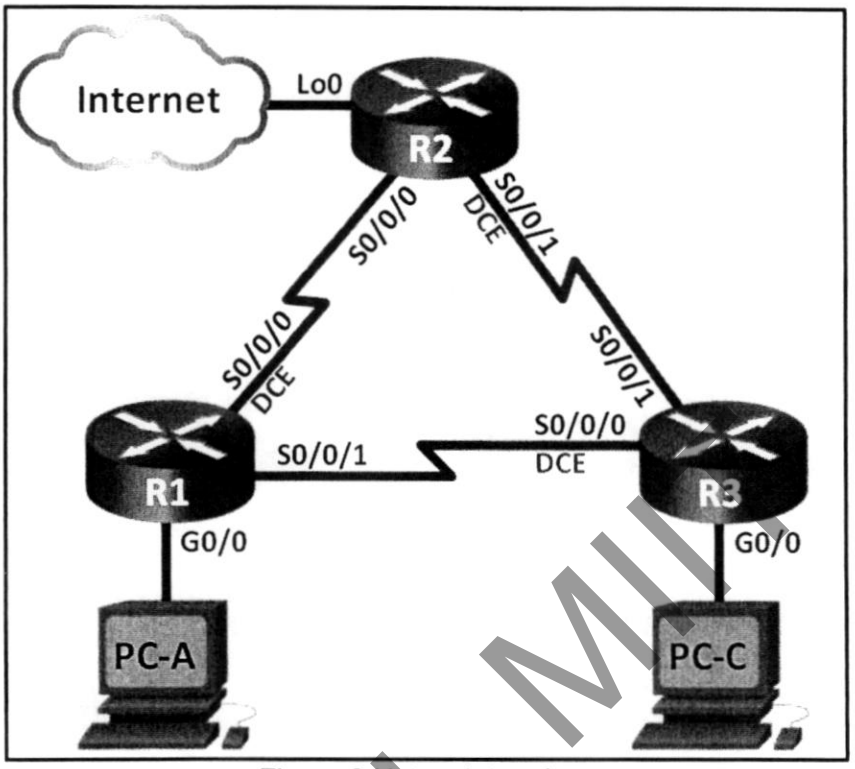


Figure 3 Network topology

**Table 2 Addressing Table**

| Device | Interface | IP Address | Subnet Mask | Default Gateway |
|---|---|---|---|---|
| R1 | G0/0 | 192.168.1.1 | 255.255.255.0 | N/A |
| | S0/0/0 (DCE) | 192.168.12.1 | 255.255.255.252 | N/A |
| | S0/0/1 | 192.168.13.1 | 255.255.255.252 | N/A |
| R2 | Lo0 | 209.165.200.225 | 255.255.255.252 | N/A |
| | S0/0/0 | 192.168.12.2 | 255.255.255.252 | N/A |
| | S0/0/1 (DCE) | 192.168.23.1 | 255.255.255.252 | N/A |
| R3 | G0/0 | 192.168.3.1 | 255.255.255.0 | N/A |
| | S0/0/0 (DCE) | 192.168.13.2 | 255.255.255.252 | N/A |
| | S0/0/1 | 192.168.23.2 | 255.255.255.252 | N/A |
| PC-A | NIC | 192.168.1.3 | 255.255.255.0 | 192.168.1.1 |
| PC-C | NIC | 192.168.3.3 | 255.255.255.0 | 192.168.3.1 |

(a) Write a series of command to assign 1 as the process ID for this OSPF process. Each router should be given the following router ID assignments:

- R1 Router ID: **1.1.1.1**

- R2 Router ID: **2.2.2.2**
- R3 Router ID: **3.3.3.3**

(3 marks)

(b) Write a series of command to configure OSPF network information on the R1,R2 and R3. (17.5 marks)

(e) Write a series of command to use the **bandwidth 128** interface command on all serial interfaces at R1 and R2. (4 marks)

(f) Write a command to view the default cost settings on the router interfaces.

(0.5 marks)

[Total: 25 marks]

**Question 5**

Based on Figure 4, answer the following questions.

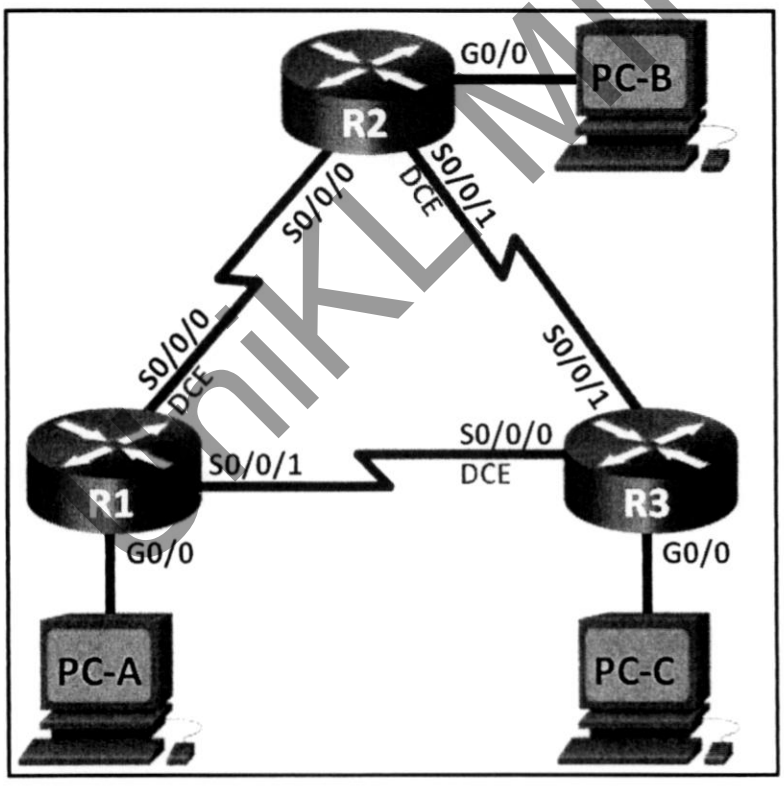


Figure 4 Network topology

**Table 3 Addressing Table**

| Device | Interface | IP Address | Subnet Mask | Default Gateway |
|---|---|---|---|---|
| R1 | G0/0 | 192.168.1.1 | 255.255.255.0 | N/A |
| | S0/0/0 (DCE) | 10.1.1.1 | 255.255.255.252 | N/A |
| | S0/0/1 | 10.3.3.1 | 255.255.255.252 | N/A |
| R2 | G0/0 | 192.168.2.1 | 255.255.255.0 | N/A |
| | S0/0/0 | 10.1.1.2 | 255.255.255.252 | N/A |
| | S0/0/1 (DCE) | 10.2.2.2 | 255.255.255.252 | N/A |
| R3 | G0/0 | 192.168.3.1 | 255.255.255.0 | N/A |
| | S0/0/0 (DCE) | 10.3.3.2 | 255.255.255.252 | N/A |
| | S0/0/1 | 10.2.2.1 | 255.255.255.252 | N/A |
| PC-A | NIC | 192.168.1.3 | 255.255.255.0 | 192.168.1.1 |
| PC-B | NIC | 192.168.2.3 | 255.255.255.0 | 192.168.2.1 |
| PC-C | NIC | 192.168.3.3 | 255.255.255.0 | 192.168.3.1 |

(a) Write a command to enable EIGRP routing on R1. Use AS number 10. (2 marks)

(b) Write a series of command to advertise the directly connected networks on R1 using the wildcard mask. (4.5 marks)

(c) Explain the purpose of using wildcard mask when advertising network. (3 marks)

(d) Write a series of command to configure G0/0 interface as passive on R1, R2 and R3. (4.5 marks)

[Total: 25 marks]



**END OF EXAMINATION PAPER**