



MALAYSIA INSTITUTE OF INFORMATION TECHNOLOGY

**FINAL EXAMINATION
JANUARY 2016 SEMESTER**

SUBJECT CODE : INB35605
SUBJECT TITLE : ADVANCED ROUTING
LEVEL : BACHELOR
TIME / DURATION : 2.00PM – 4.30PM
(2 ½ HOURS)
DATE : 26 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 (1) section. Section A.
4. Answer FOUR (4) questions ONLY.
5. Please write your answers on the answer booklet provided.
6. Answer all questions in English.

THERE ARE 9 PAGES OF QUESTIONS, INCLUDING THIS PAGE.

SECTION A (Total: 100 marks)**INSTRUCTION: Answer FOUR (4) questions ONLY.****Please use the answer booklet provided.****Question 1**

- (a) Contrast between EIGRP and OSPF in term of packet types, algorithm used and configuration (by given an example). (10 marks)
- (b) Describe about OSPF over Point-to-point Subinterfaces. (5 marks)
- (c) Refer to Figure 1. LabuSayung Corporation is a worldwide auction provider. The network uses EIGRP as its routing protocol throughout the corporation. The network administrator does not understand the convergence of EIGRP.

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R1#
IP EIGRP Topology table for AS(65001)/ID (172.17.10.1)

Codes: P-Passive, A-Active, U-Update, Q-Query, R-Reply,
r-reply Status, s-sia Status

P 172.17.3.128/25, 2 successors, FD is 30720
  via 172.17.10.2 (30720/28160), FastEthernet0/1
  via 172.17.3.2 (30720/28160), FastEthernet0/3
P 10.140.0.0/24, 1 successors, FD is 156160
  via 172.17.3.2 (156160/128256), FastEthernet0/3
  via 172.17.10.2 (157720/155160), FastEthernet0/1
P 172.17.10.0/24, 1 successors, FD is 28160
  via Connected, FastEthernet0/1
P 172.17.0.0/30, 1 successors, FD is 20514560
  via 172.17.1.1 (20514560/20512000), FastEthernet0/2
  via 172.17.10.2 (20516120/20513569), FastEthernet0/1
P 172.17.1.0/24, 1 successors, FD is 28160
  via Connected, FastEthernet0/2
P 172.17.2.0/24, 1 successors, FD is 30720
  via 172.17.10.2 (30720/28160), FastEthernet0/1
  via 172.17.3.2 (33280/30720), FastEthernet0/3
P 172.17.3.0/25, 1 successors, FD is 28160
  via Connected, FastEthernet0/3

R1#

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Figure 1: Router Ouput 1

Based on the information, answer the following questions;

- i. State the command used to view the output as shown in Figure 1. (2 marks)
 - ii. Differentiate between successors and feasible successor. (4 marks)
 - iii. Based on the output, identify **TWO (2)** networks that have feasible successors. (2 marks)
- (d) Write any **TWO (2)** commands used to verifying the OSPF operation. (Your answer should not include show running-config, show startup-config and show ip interface commands) (2 marks)

[Total: 25 marks]

Question 2

- (a) Elnino Sdn Bhd has hired you as their new network engineer. Your first task is to upgrade their network routing protocol from RIP into OSPF routing protocol. All the information needed as shown in the Figure 2. Basic configuration have been configure including default routing protocol.

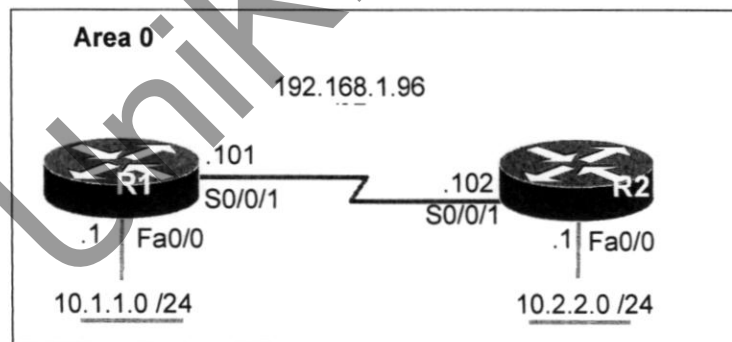


Figure 2: Network Topology 1

Based on Figure 2, answer the following questions:

- i. You have configured a loopback 1 interface on R1 earlier. The Ip address entered is 10.4.4.1/24. In order to advertise the network with the correct subnet, you need to change the network type on the loopback interface. Write the appropriate commands.

(3 marks)

- ii. For security purpose, you need to configure the OSPF interfaces with MD5 authentication. Write the appropriate commands at R1 to secure the link between R1 and R2. Password need to be set as **secret**.

(6 marks)

- (b) Study Figure 3 and answer the following questions;

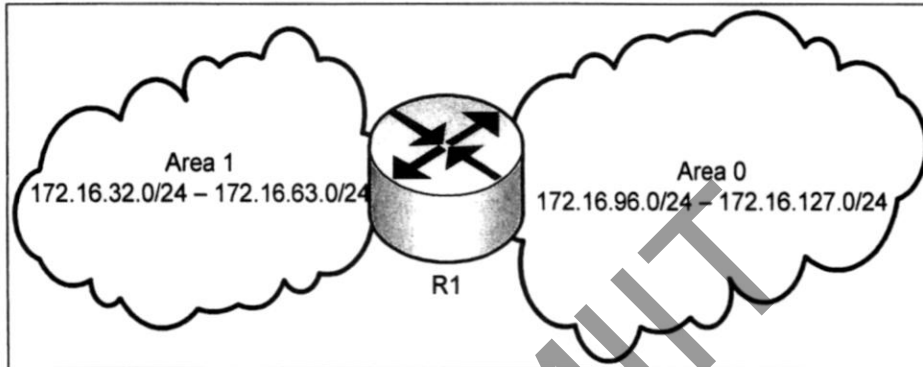


Figure 3: Network Topology 2

- i. Calculate the summary route. Show the calculation steps.
- ii. In order to summarize all routes from area 0 to area 1, write the network configuration command that can be used on the router?
- (c) State the protocol used by EIGRP for the delivery and reception of EIGRP packets.
- (d) "OSPF allows for the creation of multiple areas". Based on this statement, provide **TWO (2)** benefits of having multiple area in OSPF.

(6 marks)

(4 marks)

(2 marks)

(4 marks)

[Total: 25 marks]

Question 3

- (a) Study Figure 4 and answer the following questions.

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BGP neighbor is 10.0.0.1, remote AS 200, external link
  BGP version 4, remote router ID 10.1.1.1
  BGP state = Established, up for 00:20:47
  Last read 00:00:49, last write 00:00:41, hold time is 180,
  keepalive interval is 60 seconds
  Neighbor sessions:
    1 active, is not multisession capable (disabled)
  Neighbor capabilities:
    Route refresh: advertised and received(new)
    Four-octets ASN Capability: advertised and received
    Address family IPv4 Unicast: advertised and received
    Enhanced Refresh Capability: advertised and received
    Multisession Capability:
    Stateful switchover support enabled: NO for session 1
  Message statistics:
    InQ depth is 0
    OutQ depth is 0

                Sent          Rcvd
Opens:           1             1
Notifications:  0             0
Updates:         5             1
Keepalives:     15            17
Route Refresh:  0             0
Total:           21            19
Default minimum time between advertisement runs is 30 seconds

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Figure 4: Router Output 2

- i. Identify the command used to display the output shown in Figure 4. (2 marks)
- ii. Based on the output shown in Figure 4, what is the BGP state between this router with router connected to it? (1 mark)
- iii. How long has this connection been up? (1 mark)
- iv. State the message types that have been actively used in this exchange process. (3 marks)

- (b) The International Travel Agency (ITA) relies extensively on the internet sales. For this reason, the ITA has decided to create multihomed ISP connectivity solution and contracted with two ISP for Internet Connectivity with fault tolerance. Since the ITA is connecting to two different service providers, BGP need to be configured between the ITA boundary router and the two ISP routers. The proposed diagram is shown in Figure 5.

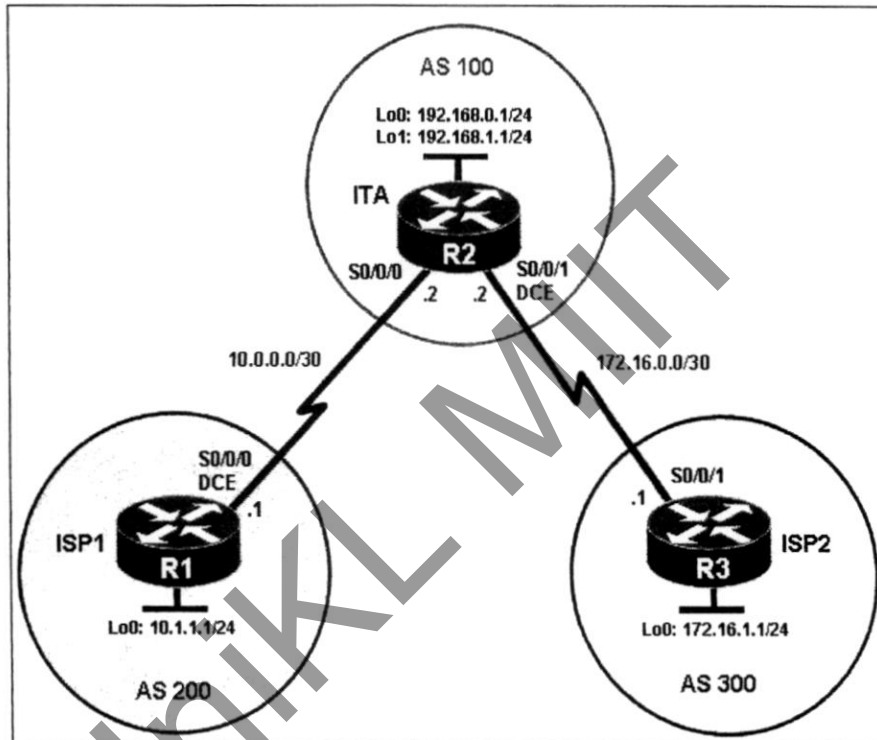


Figure 5: Network Topology 3

Based on the information given, answer the following questions;

- i. Describe multihoming. (4 marks)
- ii. At ISP2 router, write the appropriate configuration commands that will peer the BGP with ITA boundary router and advertise the ISP loopback network. (6 marks)
- iii. At ITA router, write the access list configuration commands that will advertises only ITA networks 192.168.0.0 and 192.168.1.0 to both providers. (3 marks)

- iv. At ITA router, write the appropriate configuration commands that will use static route to reflect the policy that ISP1 is the primary provider while ISP2 act as a back up. You need to specify a lower distance metric for the route to ISP1 is 210 compared to the back up route to ISP2 is 220.

(5 marks)

[Total: 25 marks]

Question 4

- (a) Route filtering is a method used to block only routes from being advertise. Explain the route filtering process. (8 marks)
- (b) Briefly describe about Distribution Lists. (9 marks)
- (c) Figure 4 shows the network of a hypothetical company. The network begins with two routing domains (autonomous systems) which, one domain is using EIGRP and the other one is using OSPF. The metric value used for redistributed into EIGRP routes are bandwidth of 10000, delay of 100, reliability of 255/255, load of 1/255 and a MTU of 1200. The link cost of the serial link to Router C is 50. The routes are redistributed as E2 routes.

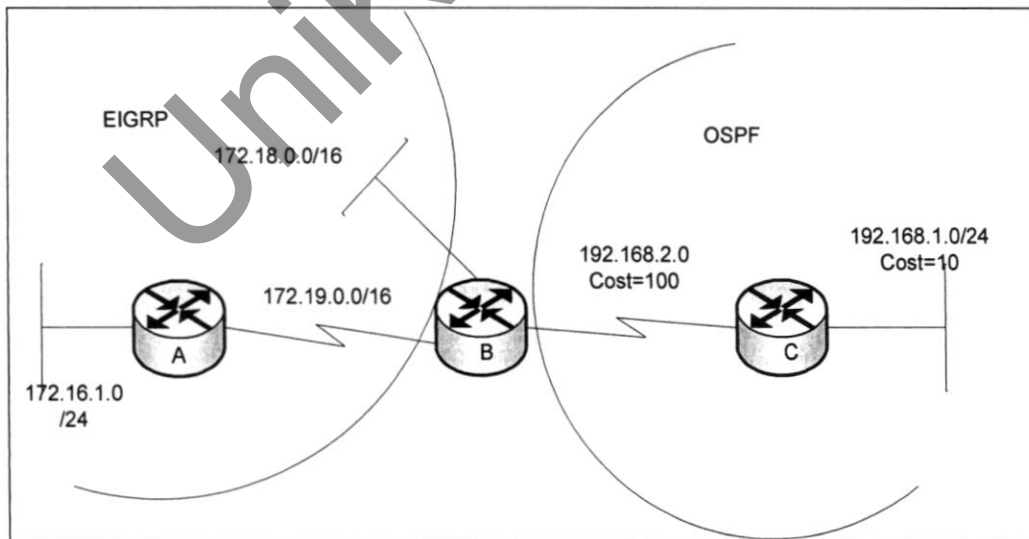


Figure 6: Network topology 4

Based on Figure 6, answer the following questions;

- i. Define Redistribution. (2 marks)
- ii. Identify which router is considered as boundary router? (1 mark)
- iii. At the boundary router, write appropriate commands that will advertise the networks to other routers. (5 marks)
- iv. At the boundary router, write appropriate commands that will redistribute all the OSPF routes into EIGRP domain. (5 marks)

[Total: 25 marks]

Question 5

- (a) Explain how the policy-based routing (PBR) operate. Draw a flow chart to support your answer. (10 marks)
- (b) Identify any **TWO (2)** methods that can be used to implement path control. (2 marks)
- (c) Al-Khawarizmi Bhd has hired you as their new network engineer. Your company is in the process of implementing IPv6 in their network. Currently the routing protocol used is EIGRP with IPv4 implementation. Your task is to enable IPv6 features so that the company network also supports IPv6 technology. Since the company are using CISCO devices, you decided to use the 6to4 tunnel technique as the transitioning technique from IPv4 to IPv6. All the information needed is shown in the Figure 7.

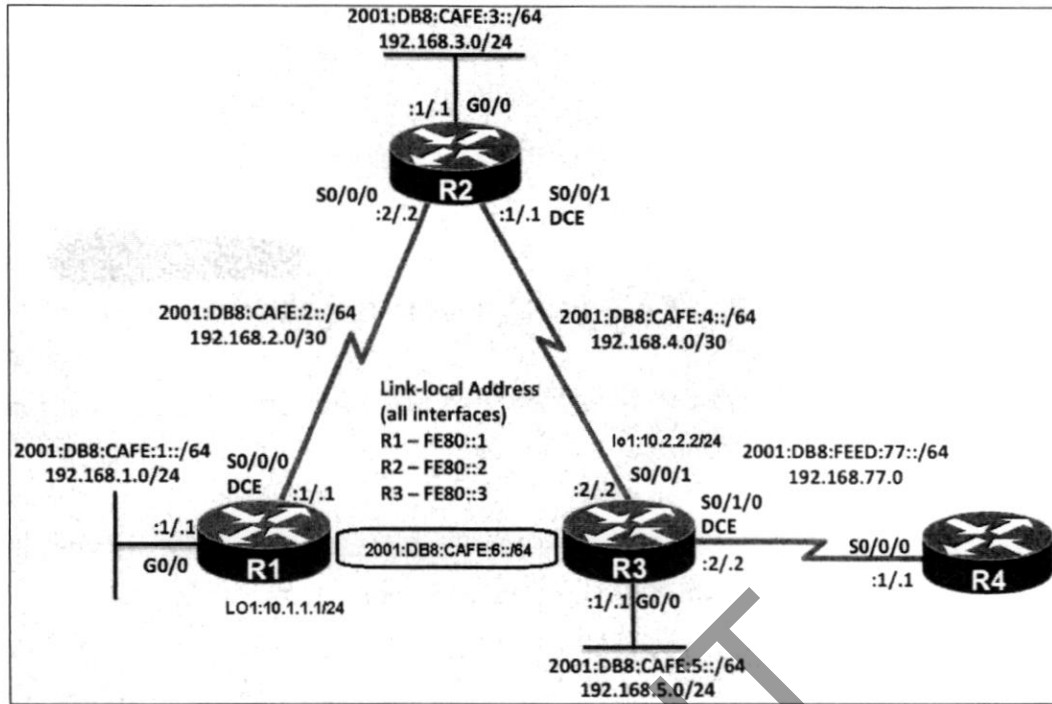


Figure 7: Network Topology 5

Based on the information provided, answer the following questions;

- i. Describe about 6to4 tunnels technique. (4 marks)
- ii. At R3, write appropriate configuration commands that will enable the 6to4 tunnel technique. The tunnel number is 0. (6 marks)
- iii. At R4, write appropriate configuration commands that will enable the IPv6 routing and EIGRP for IPv6 on the router. The autonomous system number for the EIGRP is 100. (3 mark)

[Total: 25 marks]

END OF EXAMINATION PAPER