INSTITUTE OF TECHNOLOGY

BLANCHARDSTOWN

Year	Year 3
Semester	January, Semester 1
Date of Examination	
Time of Examination	

Prog Code	BN013	**Prog Title**	Bachelor of Science in Computing in Information Technology	**Module Code**	COMP H3028
Prog Code	BN302	**Prog Title**	Bachelor of Science in Computing in Information Technology	**Module Code**	COMP H3028
Prog Code	BN104	**Prog Title**	Bachelor of Science (Honours) in Computing	**Module Code**	COMP H3028

Module Title	Advanced Switching and Routing

Internal Examiner(s): **Michael O'Donnell**
External Examiner(s): **Dr. Richard Studdert,**

Instructions to candidates:

1) **Attempt ALL PARTS of Question 1 and any TWO other questions**
2) **Question 1 is worth 40 marks and all other questions are worth 30 marks each.**

DO NOT TURN OVER THIS PAGE UNTIL YOU ARE TOLD TO DO SO

Question 1 (Mandatory)

(a) List **two** common problems in the configuration of Inter-VLAN Routing and indicate how they might be resolved.

(8 marks)

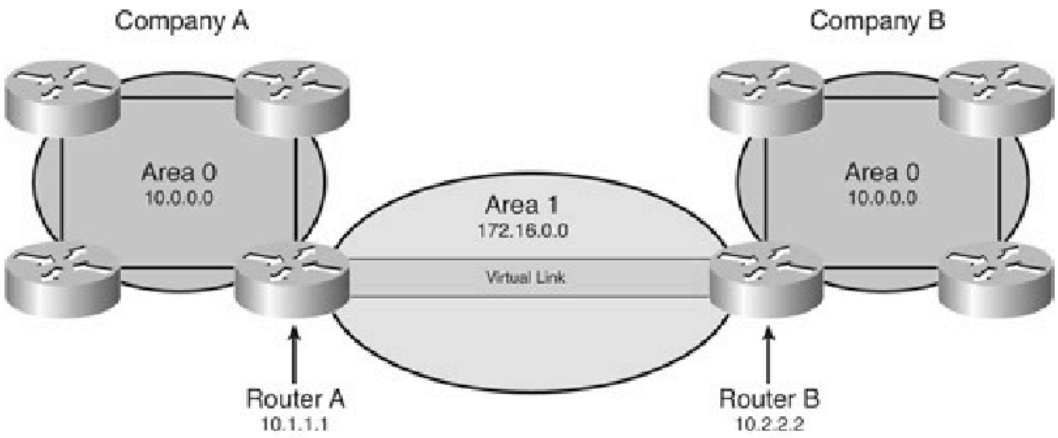
(b) Outline the main situations where the route redistribution of Interior Gateway Protocols would be appropriate.

(8 marks)

(c) Outline the main benefits of using EtherChannel in LAN switch-to-switch implementations.

(8 marks)

(d)



In the topology above, area 0 is discontiguous. A virtual link is used as a backup strategy to temporarily connect area 0. Area 1 is used as the transit area. Router A builds a virtual link to Router B, and Router B builds a virtual link to the Router A.

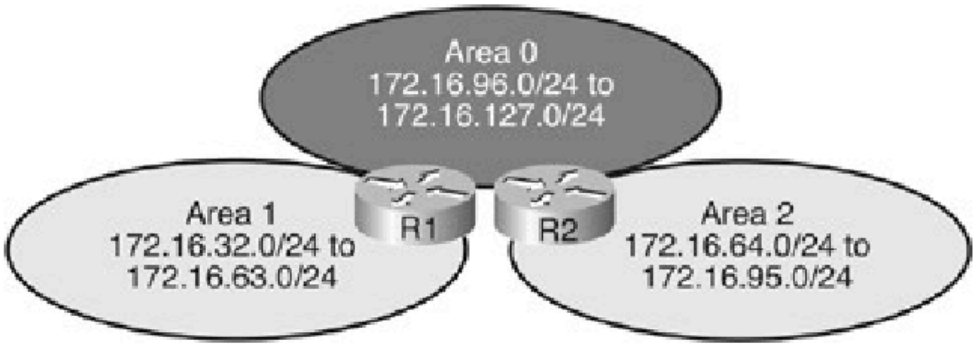
What configuration is needed on Router A to allow this to happen?

(8 marks)

Question 1 (Contd. on next page)

Question 1 (Contd.)

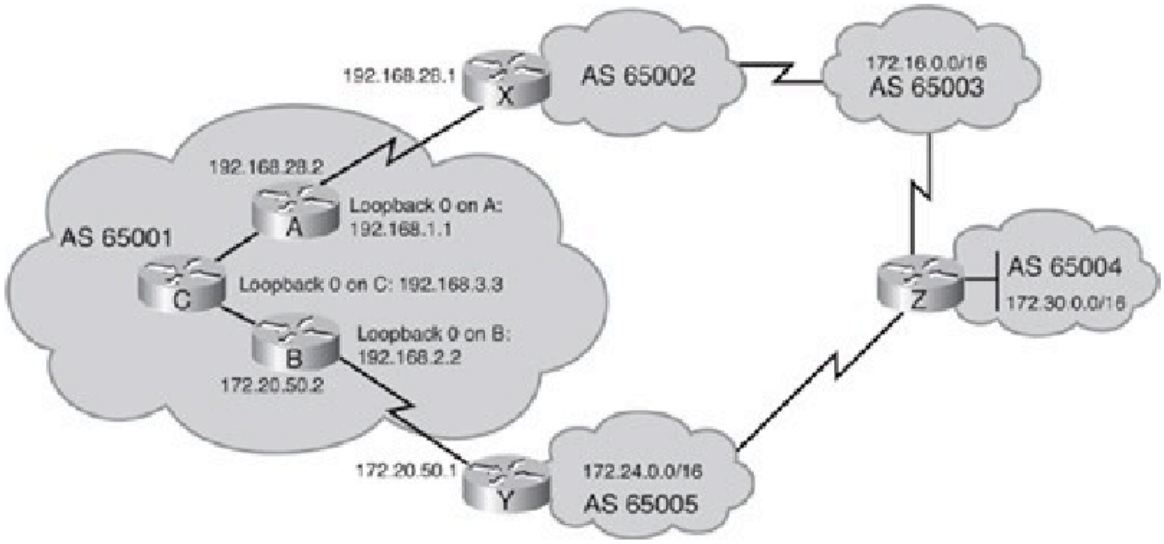
(e)



What configuration on R1 is needed to configure OSPF and summarise the networks in both Area 0 and Area 1 in the topology above.

(8 marks)

Question 2



In the topology above, Routers A, B and C are running IBGP between them and Router A and Router B is running eBGP with all of the other autonomous systems. Assume also that Routers A, B and C are using their Loopback addresses to form neighbor relationships with each other.

Question 2 (Contd. on next page)

Question 2 (Contd.)

(a) Assuming that Router C **cannot** reach the next hop address of 192.168.29.1 on Router X and next hop of 172.20.50.1 on Router Y, what extra configuration is needed to solve this problem?

(6 marks)

(b) To reach Network 172.30.0.0/16 off Router Z, Router C will choose the path:

Router B ⟶ Router Y ⟶ Router Z

because this is currently the shortest AS Path.

Use the Weight Attribute on an appropriate router to change this path so that now Router C will reach the 172.30.0.0/16 using the path:

Router A ⟶ Router X ⟶ AS 65003 ⟶ Router Z

(8 marks)

(c) Configure the Local Preference attribute and a Route Map on Router B so that Router B will choose the path

Router B ⟶ Router Y ⟶ Router Z ⟶ AS 65003 to reach the

172.16.0.0/16 network in AS 65003 and Router A will choose the path

Router X ⟶ AS 65003 ⟶ Router Z

to reach the network 172.30.0.0./16 off Router Z.

(12 marks)

(d) Would the configuration of the MED attribute be appropriate in the topology above? Give a reason for your answer.

(4 marks)

Question 3

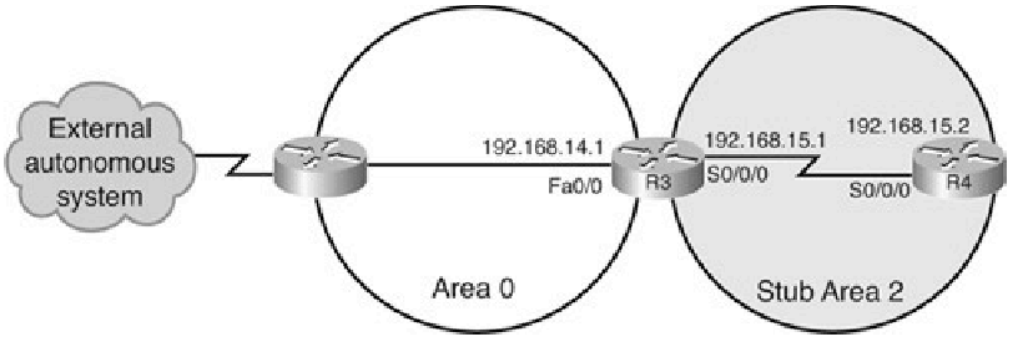
(a) OSPF uses **six** types of Link State Advertisements (LSAs) to describe the topology of an OSPF Area or network.

Describe the main characteristics of each of these **six** types.

(18 marks)

(b)

(i) Describe the effects of making Area 2 a Stub Area in the topology below.



(6 marks)

(ii) In what type of situation could Area 2 be made into a Not So Stubby Area (NSSA)?

(6 marks)

Question 4

(a) Briefly describe Switch Virtual Interfaces (SVIs) as used in Multi-Layer switches.

(6 marks)

(b) Give an overview of the Cisco Express Forwarding (CEF) technology as used in Multi-Layer switches under the following headings:

(i) Forward Information Base (FIB)

(ii) Adjacency Tables.

(12 marks)

(c) With the aid of a diagram, describe how Host A sends packets to Host B on a different network. Make reference to ARP Throttling and Packet Rewrite in your answer.

(12 marks)