

WARNING

This material has been reproduced and communicated to you by or on behalf of *Charles Darwin University* in accordance with section 113P of the *Copyright Act 1968 (Act)*.

The material in this communication may be subject to copyright under the Act.
Any further reproduction or communication of this material by you may be the subject of copyright protection under the Act.

Do not remove this notice



Family Name					
Given Name/s					
Student Number					
Teaching Period	Semester 1, 2019				

HIT374 – Enterprise Network Engineering	DURATION	
	Reading Time:	10 minutes
	Writing Time:	180 minutes
INSTRUCTIONS TO CANDIDATES		
The examination has 2 sections		
Section A:	Short Answer Questions: Answer ALL 18 questions	
Suggested Time:	110 minutes (30 marks)	
Section B:	Case Study: Answer ALL 2 questions	
Suggested Time:	70 minutes (20 marks)	
<p>Answer all questions in the booklet provided. Note that questions ARE NOT of equal value. Read ALL questions carefully. Do not commence writing until instructed to do so.</p>		
EXAM CONDITIONS		
<u>You may begin writing from the commencement of the examination session.</u> The reading time indicated above is provided as a guide only.		
This is a RESTRICTED OPEN BOOK examination		
No calculators are permitted		
One A4 sheet of handwritten double-sided notes permitted		
No dictionaries are permitted		
ADDITIONAL AUTHORISED MATERIALS	EXAMINATION MATERIALS TO BE SUPPLIED	
Lecture Textbook/s (Annotated Permitted)	1 x 20 Page Book 1 x Scrap Paper	

**THIS EXAMINATION IS PRINTED
DOUBLE-SIDED.**

**THIS PAGE HAS BEEN INTENTIONALLY
LEFT BLANK.**

Section A

Short Answer Questions

Total No of Marks for this section: 30

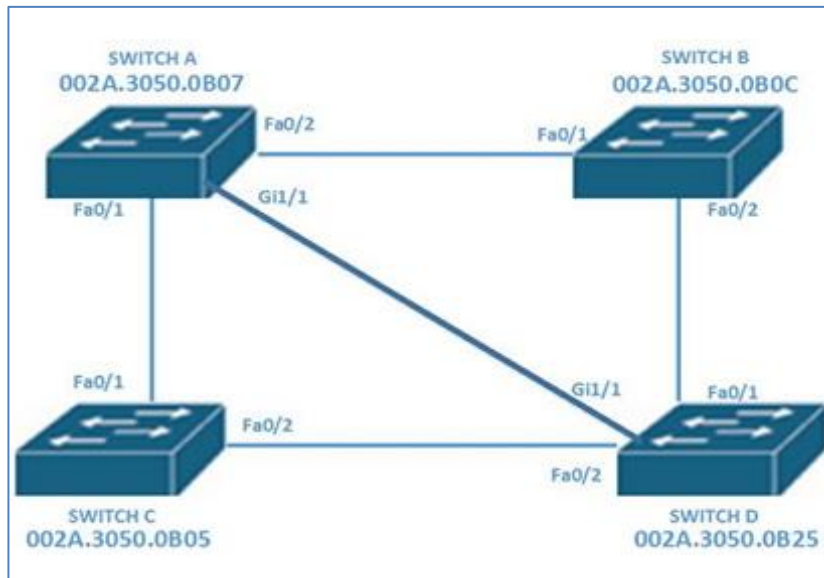
This section should be answered in the Answer Booklet provided.

Marks for each question are indicated.

Suggested Time allocation for Section A: 110 mins

Question 1

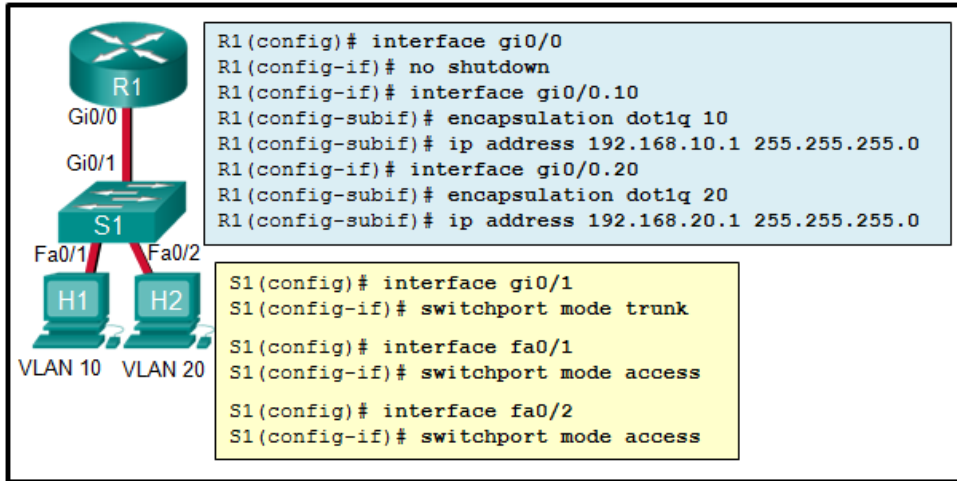
Refer to the figure below. Which ports will be the root switch, root ports and blocking ports if all the switches are operating at the same priority?



(3 marks)

Question 2

Refer to the figure below. The configuration shows commands entered by a network administrator for inter-VLAN routing. However, host H1 cannot communicate with H2. What could be the problem and what must be done to allow H1 to communicate with H2?



(2 marks)

Question 3

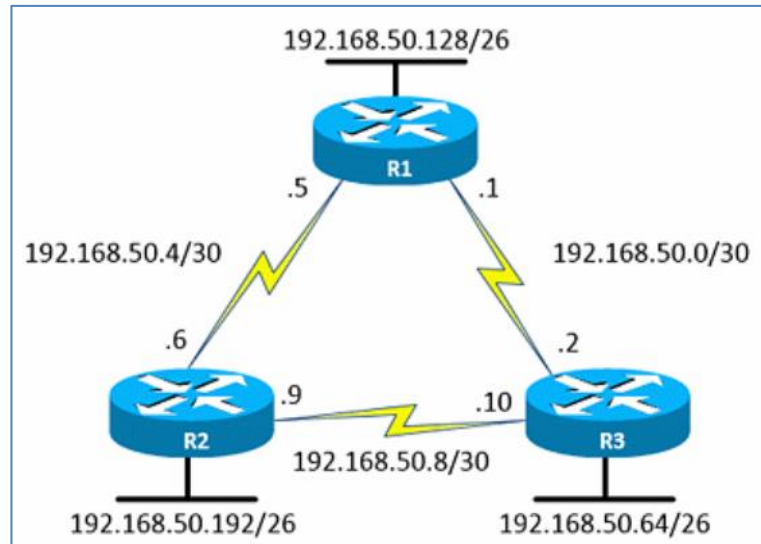
A Layer 2 Ethernet switch with 12 ports, where all ports belong to the same VLAN, has how many collision domains and how many broadcast domains?

No. of collision domains: _____

No. of broadcast domains: _____

(1 mark)

Question 4



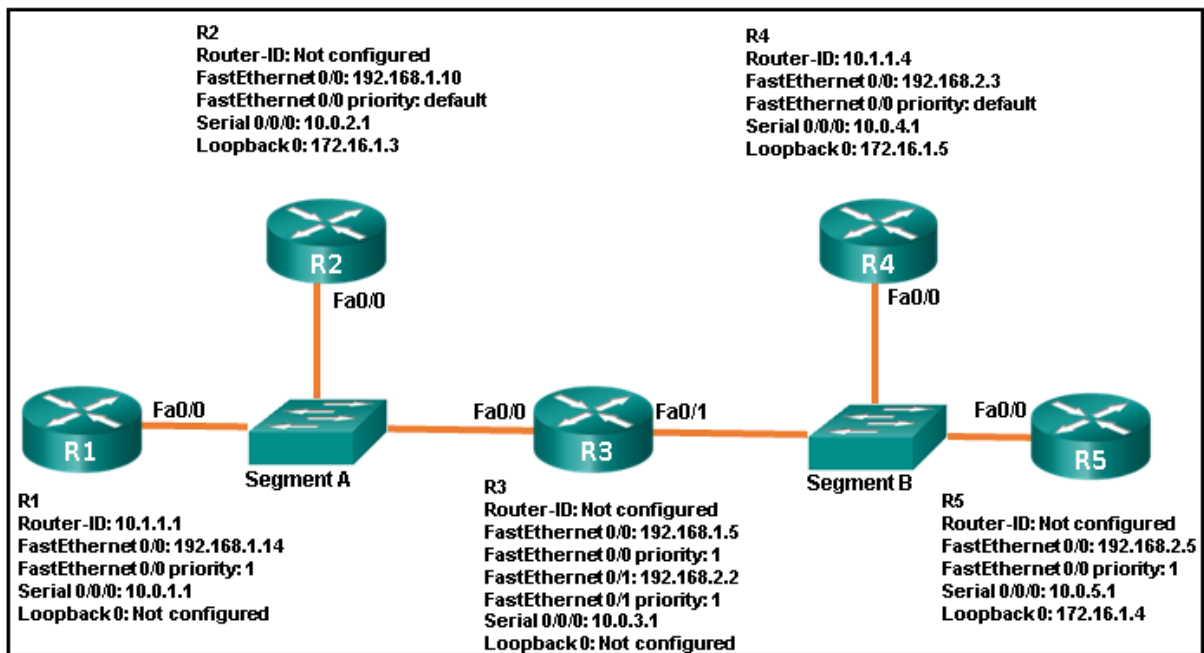
```
R3# sh ip route
Gateway of last resort is not set
  192.168.50.0/24 is variably subnetted, 6 subnets, 2 masks
C    192.168.50.64/26 is directly connected, FastEthernet0/0
C    192.168.50.8/30 is directly connected, Serial0/1
C    192.168.50.0/30 is directly connected, Serial0/0
D    192.168.50.4/30 [90/21024000] via 192.168.50.9, 02:52:16, Serial0/1
      [90/21024000] via 192.168.50.1, 02:52:16, Serial0/0
D    192.168.50.192/26 [90/20537600] via 192.168.50.9, 02:52:16, Serial0/1
D    192.168.50.128/26 [90/20537600] via 192.168.50.1, 02:52:17, Serial0/0
```

In the network diagram above, which path will packets take when travelling from host 192.168.50.126 to host 192.168.50.5?

(2 marks)

Question 5

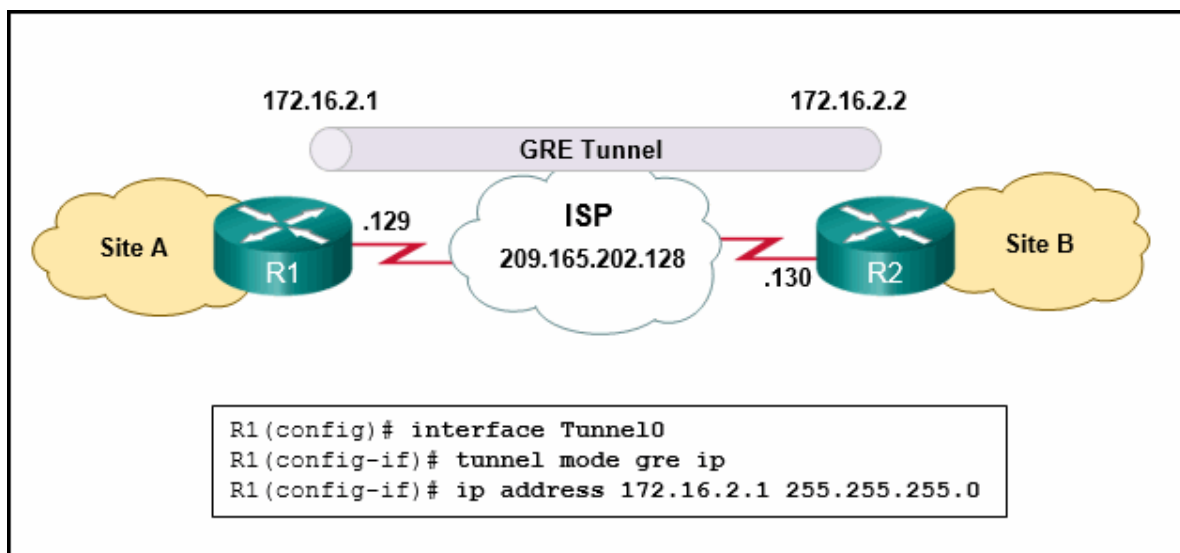
Refer to the figure below. For the given topology, what are the results of the OSPF DR and BDR elections?



(2 marks)

Question 6

Refer to the figure below. What two commands are needed to complete the GRE tunnel configuration on router R1?



(1 mark)

Question 7

Refer to the figure below. Considering how packets are processed on a router that is configured with ACLs, what is the correct order of the statements?

- A** The packet is encapsulated by a Layer 2 protocol and forwarded out the interface to the next device.
- B** If the destination is an entry in the routing table, the packet is switched to the outgoing interface; otherwise, the packet is dropped.
- C** The router checks to see whether the destination Layer 2 address matches the receiving interface Layer 2 address.
- D** If an ACL exists on the outgoing interface, the packet is tested against the statements in the list.

(1 mark)

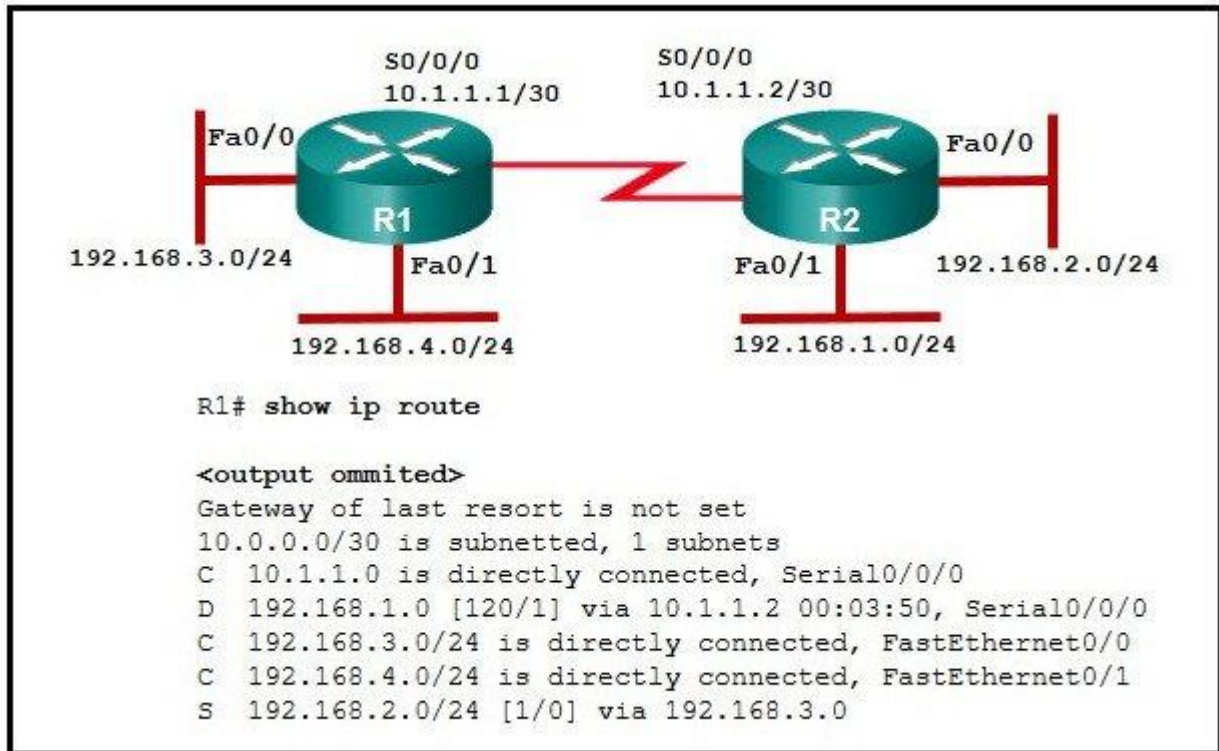
Question 8

What are two approaches to prevent packet loss due to congestion on an interface?

(1 mark)

Question 9

Refer to the figure below. A ping from R1 to 10.1.1.2 is successful, but a ping from R1 to any address in the 192.168.2.0 network fails. What is the cause of this problem and how can you solve this problem?



(2 marks)

Question 10

Refer to the figure below. Which SNMP authentication password must be used by the member of the ADMIN group that is configured on router R1?

```
R1# config t
R1(config)# enable secret cisco98765
R1(config)# username ADMIN secret cisco54321
R1(config)# ip access-list standard PERMIT-ADMIN
R1(config-std-nacl)# permit 192.168.1.0 0.0.0.255
R1(config-std-nacl)# exit
R1(config)# snmp-server view SNMP-RO iso included
R1(config)# snmp-server group ADMIN v3 priv read SNMP-RO
access PERMIT-ADMIN
R1(config)# snmp-server user MIKE ADMIN v3 auth sha
cisco123456 priv aes 128 cisco654321
R1(config)# end
R1#
```

(1 mark)

Question 11

What is the range of assignable IP addresses for a subnet containing an IP address of 172.16.1.10 /19?

(2 marks)

Question 12

What are two techniques for mitigating VLAN attacks?

(1 mark)

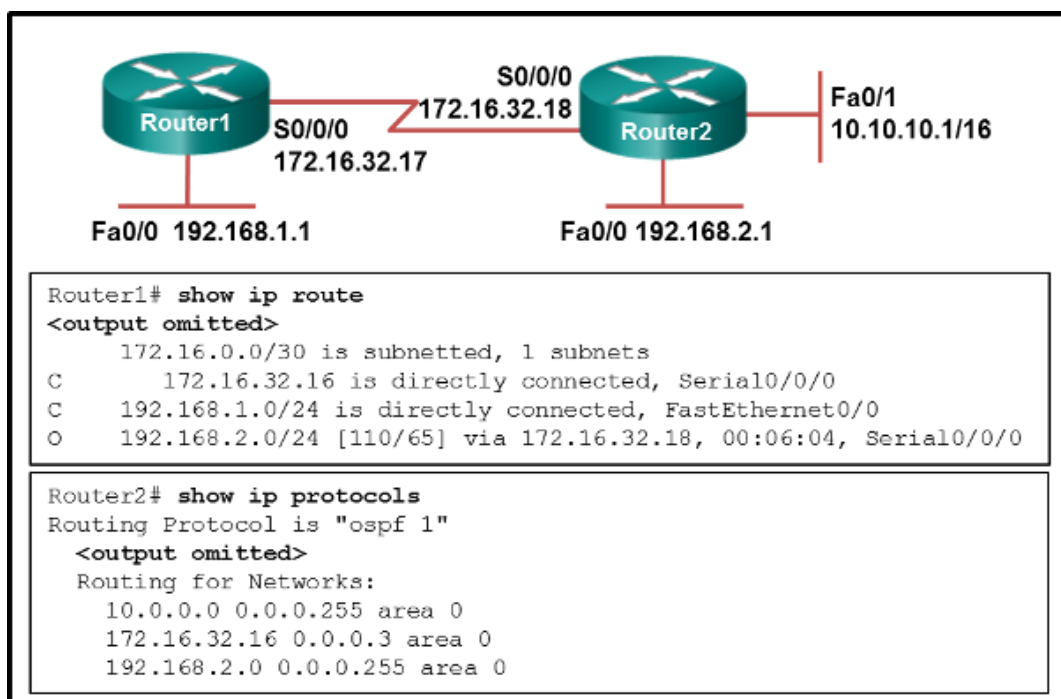
Question 13

When would the use of PAP be preferable to the use of CHAP?

(1 mark)

Question 14

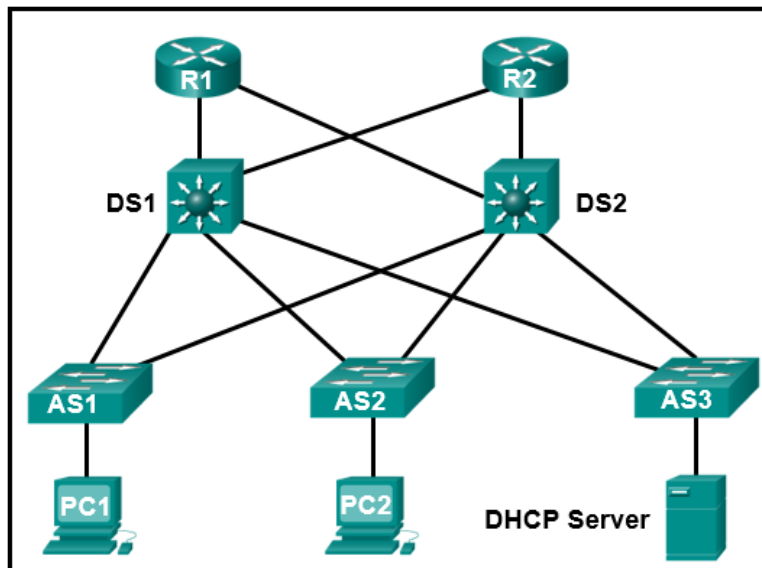
Refer to the exhibit. A network administrator is troubleshooting the OSPF network. The 10.10.0.0/16 network is not showing up in the routing table of Router1. What is the probable cause of this problem? What should be done?



(2 marks)

Question 15

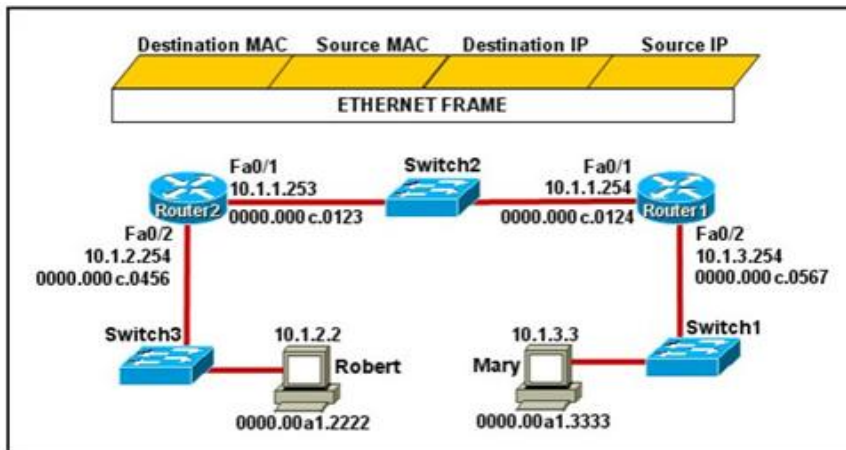
Refer to the figure below. PC1 and PC2 should be able to obtain IP address assignments from the DHCP server. How many ports among switches should be assigned as trusted ports as part of the DHCP snooping configuration?



(1 mark)

Question 16

Refer to the figure below.

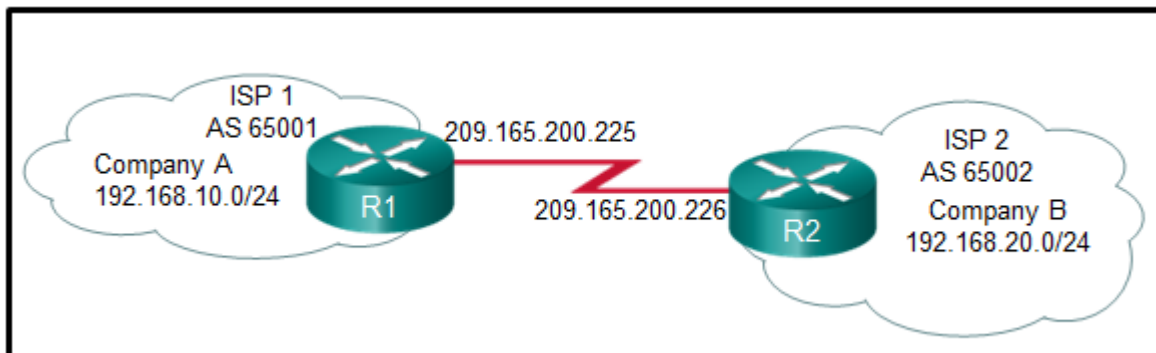


Mary is sending an instant message to Robert. The message will be broken into a series of packets that will traverse all network devices. What address will populate these packets as they are forwarded from Router 1 to Router 2? Write down the destination MAC, source MAC, destination IP and source IP addresses.

(2 marks)

Question 17

Refer to the figure below. Write down the configurations for both R1 and R2 so that a neighbour relationship can be established between them.



(2 marks)

Question 18

When would you consider EIGRP over OSPF?

(3 marks)

Section B

Case Study

Total No of Marks for this section: 20

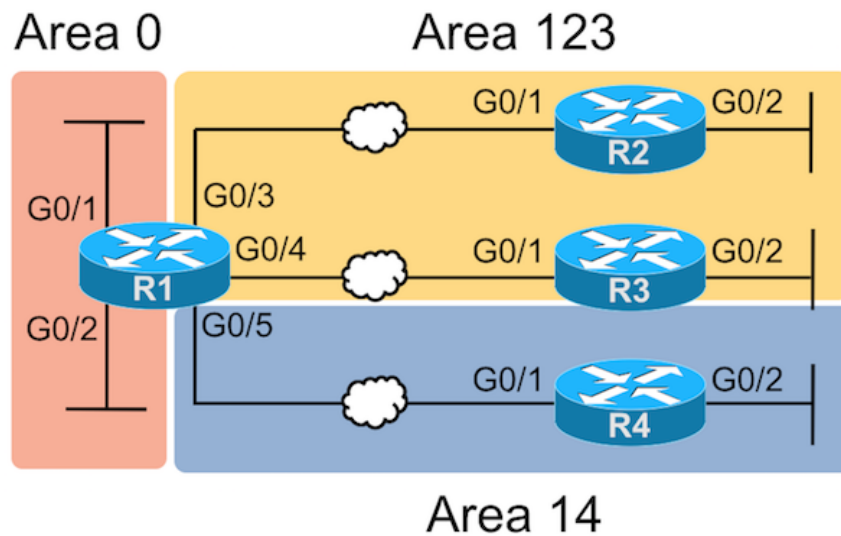
This section should be answered in the Answer Booklet provided.

Marks for each question are indicated.

Suggested Time allocation for Section A: 70 mins

Question 1

The figure below shows the design for this question.



Each of the four routers has an initial configuration that includes IPv4 addresses, working interfaces, and OSPFv2 configured with a router ID as shown in the next 4 figures.

```

1 int g0/1
2 ip addr 172.17.1.1 255.255.255.0
3 no shut
4 !
5 int g0/2
6 ip addr 172.17.2.1 255.255.254.0
7 no shut
8 !
9 int g0/3
10 ip addr 172.17.99.1 255.255.255.252
11 no shut
12 !
13 int g0/4
14 ip addr 172.17.99.41 255.255.255.248
15 no shut
16 !
17 int g0/5
18 ip addr 172.17.99.81 255.255.255.240
19 no shut
20 !
21 router ospf 1
22 router-id 1.1.1.1
23 ! Need network Commands Here

```

Router R1 Initial Configuration

```

1 !
2 int g0/1
3 ip addr 172.17.99.2 255.255.255.252
4 no shut
5 !
6 int g0/2
7 ip addr 172.17.4.2 255.255.252.0
8 no shut
9 !
10 !
11 router ospf 1
12 router-id 2.2.2.2
13 ! Need network Commands Here

```

Router R2 Initial Configuration

```

1 !
2 int g0/1
3 ip addr 172.17.99.43 255.255.255.248
4 no shut
5 !
6 int g0/2
7 ip addr 172.17.8.3 255.255.248.0
8 no shut
9 !
10 !
11 router ospf 1
12 router-id 3.3.3.3
13 ! Need network Commands Here

```

Router R3 Initial Configuration

```

1 !
2 int g0/1
3 ip addr 172.17.99.84 255.255.255.240
4 no shut
5 !
6 int g0/2
7 ip addr 172.17.20.4 255.255.240.0
8 no shut
9 !
10 router ospf 1
11 router-id 4.4.4.4
12 ! Need network Commands Here

```

Router R4 Initial Configuration

To complete the configuration, you need to enable OSPF on all the interfaces shown in the figure so that each router will learn the routes to all subnets shown in the figure. However, you have the following restrictions:

- R1 – Subnet wildcard: On router R1, use wildcard masks so that each network command would match all addresses in a single subnet. (5 marks)
- R2 – Network wildcard: On router R2, use wildcard masks so that each network command would match all addresses in a single classful network (that is, in a single class A, B, or C network.) (1 mark)
- R3 – Address wildcard: On router R3, use wildcard masks so that each network command would match one specific IP address. (2 marks)
- R4 – Subnet wildcard: Same rules as router R1. (2 marks)

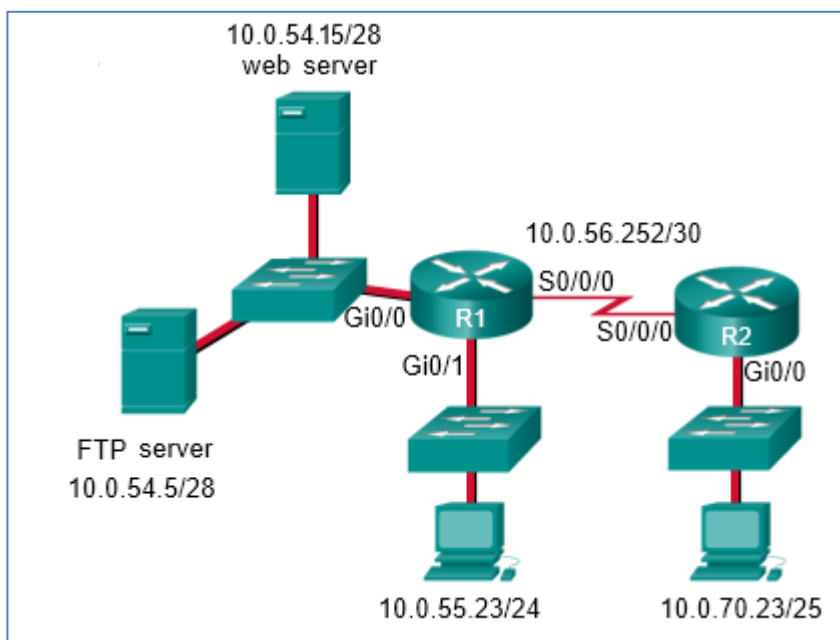
Question 2

Refer to the figure below. The network administrator that has the IP address of 10.0.70.23/25 needs to have access to the corporate FTP server (10.0.54.5/28). No other traffic should be allowed to this FTP server.

The web server (10.0.54.15/28) should only be accessible to all internal employees on networks within the 10.x.x.x address.

All other traffic should be allowed.

Which extended ACL would be used to filter this traffic, and how would this ACL be applied? You should only apply this extended ACL onto a single interface of a router. Write down the necessary commands.



(10 marks)