



EXAMINATIONS 2011 / 2012 ARHOLIADAU 2011 / 2012

Semester 2

FACULTY OF: Applied Design and Engineering
School of Applied Computing

NAME OF COURSE/PROGRAMME: B.Sc. (Hons) Computer Networks

YEAR OR LEVEL: Level 6

**NAME OF MODULE/UNIT/EXAM
PAPER:** Advanced Routing

MODULE NO: M3X8634

DATE OF EXAMINATION: 30th May 2012

EXAMINATION TIMES:

START TIME: 12:00pm

FINISH TIME: 2:00pm

TIME ALLOWED: 2 hours

INSTRUCTIONS TO CANDIDATES:

Answer three out of the four questions. Each question carries equal marks.

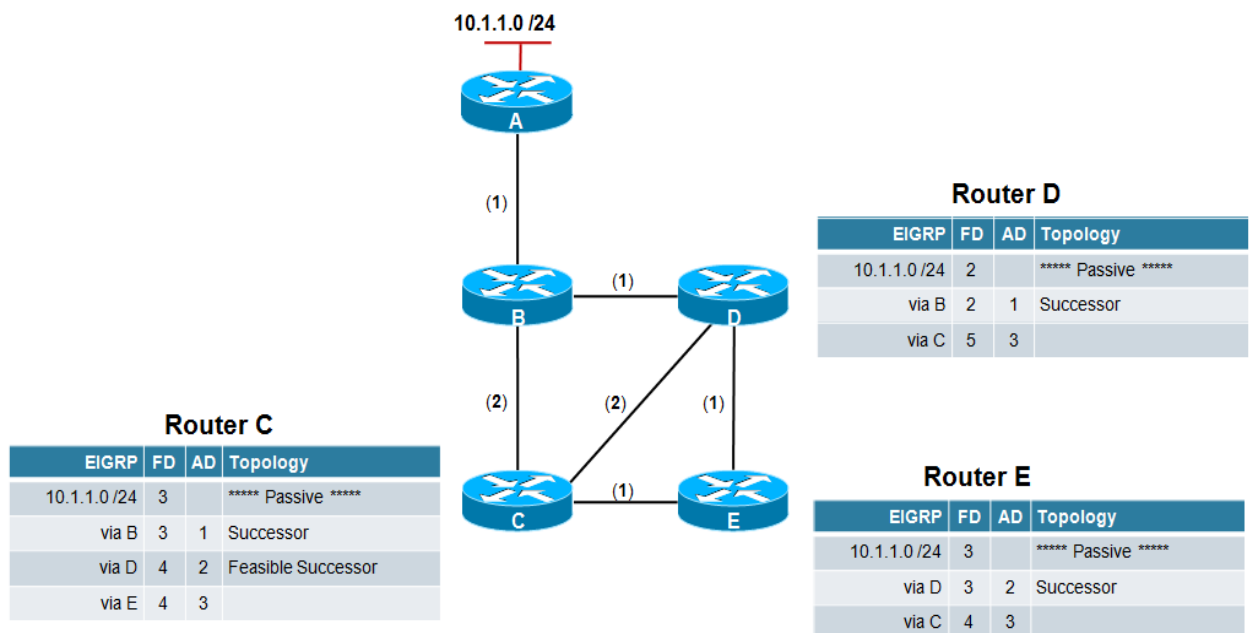
Candidates are not permitted to bring calculators, dictionaries; text books/case studies or any other reference materials into the exam room.

QUESTION ONE

- (a) Explain Distance vector and Link-state routing protocols. (4 marks)
- (b) Compare classful and classless routing protocols (10 marks)
- (c) Explain floating static route and give an example. (6 marks)
- (d) What is routing within the ECNM? (5 marks)

QUESTION TWO

- (a) What are the features of EIGRP? (5 marks)
- (b) What metrics are used for EIGRP metric calculation? (3 marks)
- (c) The network shown in diagram is fully converged. The link between Router B and Router D failed. With diagram explain DUAL operation for the network to be converged again. (10 marks)



- (d) Explain MD5 authentication in EIGRP. (7 marks)

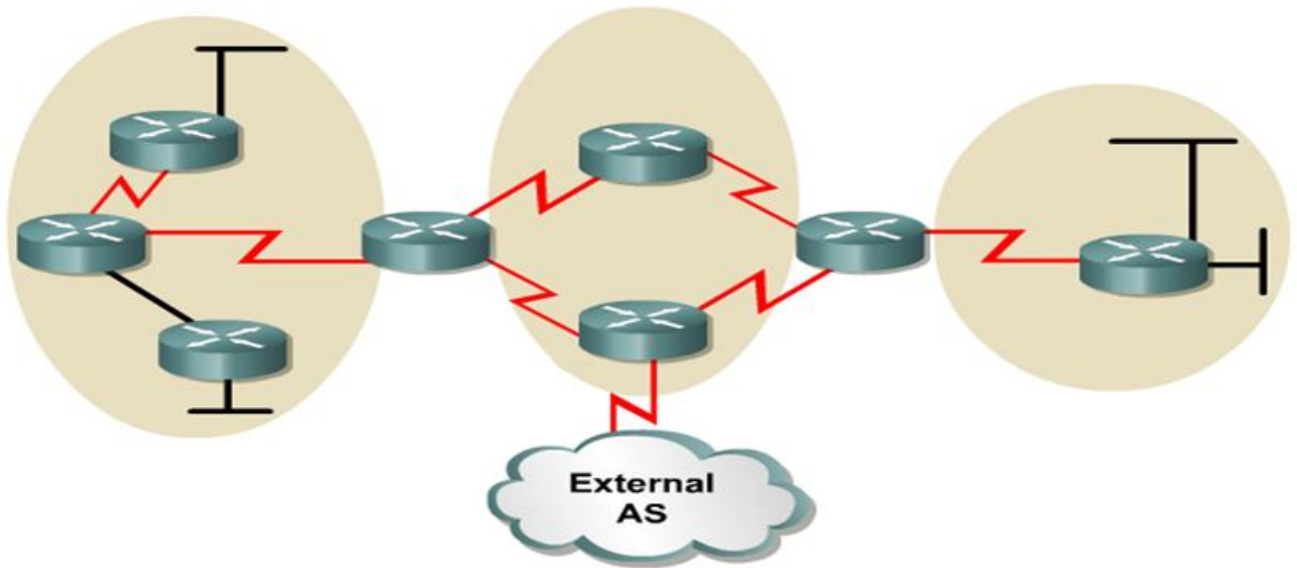
QUESTION THREE

(a) Describe OSPF router tables/databases.

(9 marks)

(b) With aid of the diagram shown below explain two-layer hierarchy and router types in OSPF.

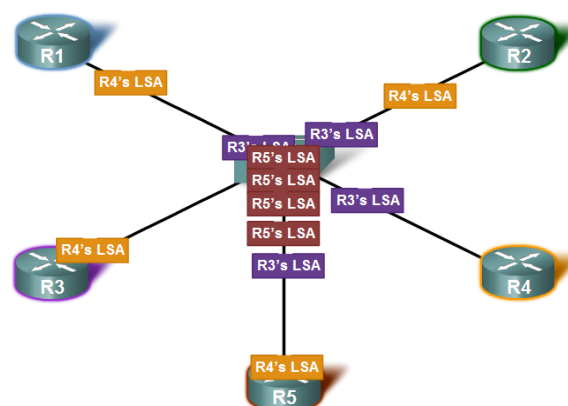
(10 marks)



(c) Extensive LSAs consume lots of bandwidth and create chaotic traffic. What solution does OSPF offer to solve this problem?

(6 marks)

LSA Flooding Scenario



QUESTION FOUR

- (a) An autonomous system can be between 1 to 65,535. List the range reserved for private use and RIR managed AS.

(2 marks)

- (b) From the exhibit shown below what letters do i and ? denote?

(2 marks)

```
R1# show ip bgp
BGP table version is 24, local router ID is 172.16.1.2
Status codes: s suppressed, d damped, h history, * valid, > best, i -
internal
Origin codes: i - IGP, e - EGP, ? - incomplete

   Network          Next Hop           Metric  LocPrf  Weight  Path
*> 192.208.10.0      192.208.10.5           0             0 300 i
*> 172.16.1.0        0.0.0.0                0          32768  i
<output omitted>
```

```
R1# show ip bgp
<output omitted>

   Network          Next Hop           Metric  LocPrf  Weight  Path
*> 10.1.1.0/24       0.0.0.0              0          32768  ?
*> 192.168.1.0/24    10.1.1.2             84         32768  ?
*> 192.168.2.0/24    10.1.1.2             74         32768  ?
<output omitted>
```

- (c) Router R1 and R2 are not able to reach Router R4. The routing tables of all routers are shown below. What is the solution to fix this connectivity issue?

(6 marks)

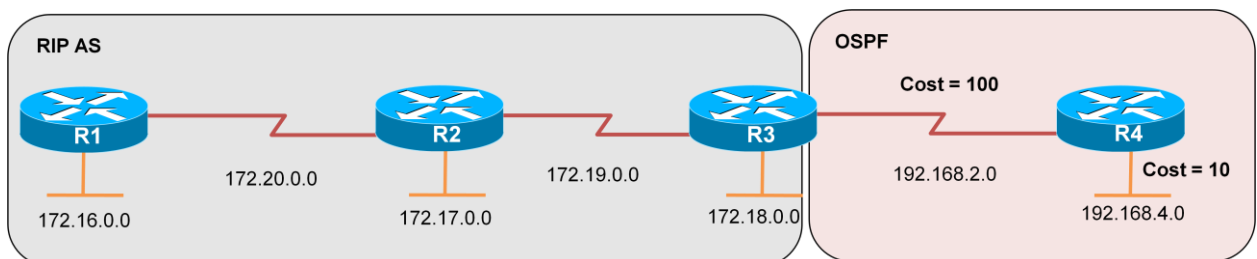


Table R1

```

C 172.16.0.0
C 172.20.0.0
R [120/1] 172.17.0.0
R [120/1] 172.19.0.0
R [120/2] 172.18.0.0

```

Table R2

```

C 172.17.0.0
C 172.19.0.0
C 172.20.0.0
R [120/1] 172.16.0.0
R [120/1] 172.18.0.0

```

Table R3

```

C 172.18.0.0
C 172.19.0.0
R [120/1] 172.17.0.0
R [120/1] 172.20.0.0
R [120/2] 172.16.0.0
C 192.168.2.0
O [110/110] 192.168.1.0

```

Table R4

```

C 192.168.1.0
C 192.168.2.0

```

(d) R1 in AS 65102 is dual-homed with R2 in AS 65101. A problem can occur if R1 only uses a single **neighbor** statement pointing to 192.168.1.18 on R2. If the link fails, the BGP session between these AS is lost and no packets pass from one AS to the next, even though another link exists. A solution to this is to configure two neighbor statements on R1 pointing to 162.168.1.18 and 192.168.1.34. However this doubles the BGP updates from R1 to R2. What is the ideal solution for this problem?

(15 marks)

