January 2019

Coventry University

Faculty of Engineering, Environment and Computing

360CT

Advanced Network Management and Design

Instructions to candidates

Time allowed: **3** hours **0** minutes

This is a Closed Book Examination

Answer:

Any 4 Questions

The total number of questions in this paper: 6

All questions carry equal marks

Start each question on a new page and carefully identify your answers with the correct question number

For this examination you will be supplied with the following:

1 Answer Book/s

You may take this question paper away at the end of the examination.

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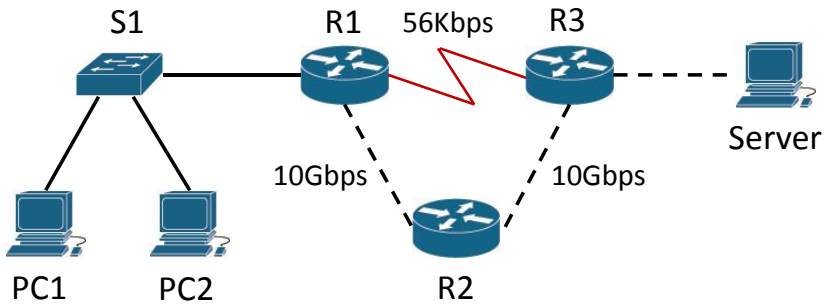
1. a) Assuming the Administrative Distance of RIP is 120 and OSPF is 110, answer the following questions regarding the diagram provided.



i) How many broadcast and collision domains? (2 marks)

ii) Which route a packet from PC1 to the Server follow if RIP routing protocol was used and why? (2 marks)

iii) Which route a packet from PC1 to the Server follow if OSPF routing protocol was used and why? (2 marks)

iv) Assuming both RIP and OSPF were used simultaneously, which routes would be preferred and why? (4 marks)

b) Discuss how OSPF (Open Shortest Path First) operates and the advantages of that approach. Would this protocol work for a small network with only a handful of networking devices? (10 marks)

c) Due to a problem a routing loop has formed between four routing devices. What will happen to any packets entering it? (5 marks)

Continue

2. a) In the context of network design what is meant by the term “network diameter”? Briefly discuss the effects of increasing this value. (5 marks)

   b) Briefly discuss the advantages of employing a “layered” approach towards network design. (5 marks)

   c) Explain the three-tier hierarchical network design approach. Name the three layers and discuss their role, function and relationship with each other. (15 marks)

Continue

3. a) Explain how the two TCP/IP transport layer protocols (TCP and UDP) are employed in the context of VoIP telephony. (5 marks)

   b) One of the features of PPP is “multilink”. Briefly explain what this involves and what the advantages of this would be. (5 marks)

   c) Briefly explain “*connection oriented*” and “*connectionless*” communication. (5 marks)

   d) Explain QoS (Quality of Service) in the context of VoIP and describe the three methods that could be employed. (5 marks)

   e) Extended Unique Identifier (EUI), allows a host to assign itself a unique 64-Bit IPv6 interface identifier (EUI-64). Briefly explain the steps involved in doing so and write down the IPv6 address generated given the MAC address FF-11-11-22-22-22. (5 marks)

Continue

4. a) Explain how layer 2 switches make forwarding decisions and learn about potential destinations. (5 marks)

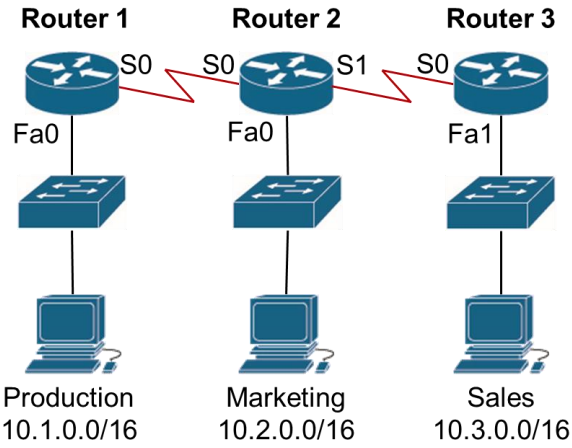
   b) The users of a particular department are spread across a number of offices within a 500 meter area. Assume UTP 5e cable is used and that you have *managed* switches at your disposal. Discuss how those users could be added into a *logical* LAN. (5 marks)

   c) List some of the problems that could arise in a redundant network if STP was disabled, providing a brief explanation of each. (5 marks)

   d) Discuss the benefits of employing devices that support VLAN trunking. Would this feature be a useful addition for a symmetric switch that has no support for etherchannel? (10 marks)

Continue

5. a) Answer the following questions regarding the network and ACL shown in the following diagram, assuming it was **applied on port fa0 of router 1 in the "in" direction**.




```
Access-list 106 permit tcp 10.1.0.0 0.0.255.255 10.3.0.0 0.0.255.255 eq www
Access-list 106 permit tcp 10.1.0.0 0.0.255.255 10.3.0.0 0.0.255.255 eq ftp
Access-list 106 permit tcp 10.1.0.0 0.0.255.255 host 10.3.0.1 eq telnet
Access-list 106 deny ip any any
```

i. Is this ACL standard or extended? (1 mark)

ii. Would a host in marketing be able to access a web server in sales? (1 mark)

iii. Would a host in marketing be able to telnet to 10.3.0.2? (1 mark)

iv. A host in marketing has failed to ping a host in production. What has gone wrong? (2 marks)

b) Briefly discuss how VLANs can be employed as a mechanism for improving security in a network. (5 marks)

c) Briefly explain the difference between standard and extended ACLs and comment on where those should be placed and why. (5 marks)

d) VLAN membership can be static or dynamic. Discuss the implications (and possible problems) of each of these options in terms of security. (10 marks)

Continue

6. a) Briefly explain the difference between the *push* and *pull* methods employed by SNMP (Simple Network Management Protocol). (5 marks)

   b) List the four approaches/strategies that can be employed to deal with risk, providing an example for each one. (5 marks)

   c) Could a policy document help in reducing risk for a company? Briefly discuss, giving examples if necessary. (5 marks)

   d) You are in the process of identifying the risks for a medium size (200 employees) investment company located in a two-storey building at the banks of river Avon. Produce an impact/probably chart and briefly discuss your assumptions and the main issues/risks identified and why they matter. (10 marks)

END