

Midterm: NET2000 – Intermediate Networking

Fall 2022

Time: **100** minutes; Test scored out of: **70** Total Marks available: **77**
(Allocation of marks is shown beside each question)

INSTRUCTIONS:

1. **BEFORE** answering any questions, please check that your copy of the test has all pages (as indicated in the footer at the bottom of each page).
Please **read all questions** carefully, then answer question 0 first!
2. This is a **closed book** test. No textbooks, notes, electronic devices, or any other aids are permitted.
3. For all multiple choice questions:
 - questions are worth 1 mark unless otherwise noted;
 - choose the best answer unless the question indicates otherwise;
 - a **penalty of –5 marks** will apply if you don't bubble your student ID or test version!
4. All references to the textbook relate to the book with ISBN-13: 978-0-13-663432-4
5. If you are uncertain what a question is asking, make reasonable assumptions, write those assumptions down on this test paper, and continue answering the question.

0. What is your:

NAME? _____

VERSION A

- A. [1 mark] (Cisco IOS) What statement controls whether a router generates RA messages for IPv6 hosts? Type the CLI configuration line. [Ref: Lab 3 Task 5]
- B. [2 marks] Clearly identify the precedence (or process) that Cisco IOS uses to choose the router ID for OSPF. [Ref: Wk03 OSPF config - slide 9]
- C. [1 mark] Given the IP and Mask 148.26.153.70/23 determine the subnet address. Give your answer in CIDR notation. [Ref: Lab 1 - subnetting]
- D. [1 mark] Given the Network ID 23.144.221.0/27, determine the smallest subnet possible that provides 8 usable hosts per subnet. Give the subnet address in CIDR notation. [Lab 1]
- E. [1 mark] From the network 219.205.119.108/25, subnet to provide at least 12 subnets while maximizing the number of hosts per subnet. Give the new mask in CIDR notation, and the number of usable hosts per subnet. [Ref: Lab 1 - subnetting]
- F. [1 mark] For a converged network (as defined in ENSA Ch 11), **clearly** identify the three types of traffic in the network? [Ref: Ch 11; Quiz 1]
- G. [3 marks] **Clearly** identify each of the layers in three tier hierarchical network design model. For each layer, provide a short but **clear** description of it's purpose and role. [Ref: Ch 11.1] [You may find it helpful to draw a diagram that you can reference in your description(s).]

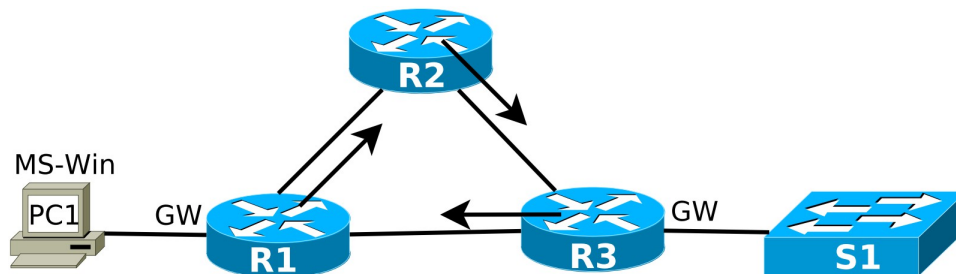
- H. [2 marks] For a *collapsed-core* network design, **clearly** explain: [Ref: Ch 11.1]
A. the total number of layers and which layers have been "collapsed together"; and
B. an example where collapsed-core is more suitable than a three tier design.
- I. [3 marks] In this course we examined five (5) different methods which contribute to network scalability. Identify and **clearly** describe at least 3 of those methods. [Ref: Ch 11.2]
- J. [1 mark] *What is the most compact notation for the IPv6 address [Ref: Wk02-IPv6]
B514:82C3:0000:0000:0029:EC7A:0000:EC72?
- K. [1 mark] *Write the command to configure an IPv6 default static route, given that the neighbour router has an interface address of 2001:BEEF:CAKE::1/64. [Ref: Wk02, Lab 3]
- L. [2 marks] Name and **clearly** describe the three categories of IPv6 unicast addresses.

- M. [3 marks] **Clearly** explain the procedure for forming an EUI-64 address. Give an actual numeric example that would be valid for the segment 2001::/64. [Ref: Wk02 slides]
- N. [2 marks] **Clearly** identify the alternative to using the EUI-64 process for address autoconfiguration. Don't forget to state **why** this method was chosen as the default for MS-Win 10 (... and iPhones, and various other OS's). [Ref: SRWE 8.2.5]
- O. [1 mark; Bonus] What is the ISBN of the required textbook for this course?
- P. [3 marks] Name and **clearly** describe the three data structures used by OSPF. [Ref: Wk03]
- Q. [2 marks] **Clearly** identify at least 3 parameters that *must match* and 1 parameter that must be *unique* in order for two OSPF routers to become neighbours. [Ref: Wk05Day2]

R. [1 mark] **Clearly** explain the purpose of *passive* interfaces in OSPF. [Wk03 config, slide 20]
 (It may be easiest to state what passive interfaces do and don't do.)

S. [2 marks + 1 Bonus] **Clearly** explain when the Routing Table Manager (RTM) process uses *preference*, and when it uses the *metric* for deciding whether to install a candidate route in the main routing table. HOW does it use each one? For an extra mark: **clearly** explain the situation when it doesn't need to check either one. [Ref: Wk07Day1]

T. [2 marks; 1 per row] Examine the topology diagram carefully, then fill out the chart below with the TTL values for each ping combination. All routing is static and arrows indicate the egress interface of the static default route for each router. [Ref: Labs 2, 6]



Ping Src/Dest	To PC1	To R1	To R2	To R3	To S1
From PC1					
From S1					

U. [2 marks] Demonstrate your understanding of how OSPFv3 communicates with neighbours by **clearly** explaining why a router running OSPFv3 can **never** interoperate with OSPFv2.

V. [3 marks] Correctly name and **clearly** identify the seven (7) operational states in the OSPF peering process. For each one, give a one-line description of what's happening. [Ref: Wk3]
[1 mark] Be sure to indicate the states where *Neighbour*, and *Adjacency* occur.

W. [2 marks] You've undoubtedly studied very hard for this midterm. There's surely a question you were expecting/hoping would be on the test but isn't. Now's your chance:
– **Clearly** state your question (must NOT be a duplicate of any existing question)
– **Clearly** state the correct answer.
Make sure your question is worth 2 marks: the answer must have at least two distinct parts!

Extra Work