TM257 - Cisco Networking Part 1

Open University TM257 (CCNA)

kcollins@kierancollins.co.uk

2024-11-12

Contents

1 TM259 - Cisco Networking (CCNA) Part 1

1.1 Study Calendar 2022J

Week	Date	Module Resource / Activity	Day Schools /Tutorials	TMA / EMA cut-off
		Introduction to Networks		
1	7 Oct 2023	Getting started on TM257 Module Guide Cisco NetAcad Modules 1-3: Basic Network Connectivity Link to student self enrol	Introductory group tutorial	
2	14 Oct 2023			
3	21 Oct 2023	Modules 4-7: Ethernet Concepts		
4	28 Oct 2023			
5	4 Nov 2023	Modules 8-10: Communicating Between Networks		
6	11 Nov 2023			
7	18 Nov 2023	Modules 11-13: IP Addressing	Tutorial – IP addressing	
8	25 Nov 2023			
9	2 Dec 2023	**TMA preparation** and Modules 14-15: Network Application Communications	TMA01 drop-in tutorial	
10	9 Dec 2023			**TMA01 – 14 Dec 2023**
11	16 Dec 2023	Modules 16-17 Building and Securing a Small network		
	23 Dec 2023	**BREAK**	You may study during this time, however your tutor may quite reasonably be unresponsive	
	30 Dec 2023	**BREAK**		
12	6 Jan 2024	Modules 16-17: Building and Securing a Small Network - continued		
		Introduction to Networks continued		
13	13 Jan 2024	Cisco Introduction to Networks 'final'	Please check guidance in TMA's 01 and 02	
		Switching, Routing and Wireless Essentials (SRWE)		
14	20 Jan 2024	Modules 1-4: Switching Concepts, VLANs and inter-VLAN Routing		
15	27 Jan 2024			
16	3 Feb 2024	Modules 5-6: Redundant Networks	TMA02 drop-in tutorial	
17	10 Feb 2024			
18	17 Feb 2024	**TMA 02 preparation**		**TMA02 – 22 Feb 2024**
19	24 Feb 2024	Modules 7-9: Available and Reliable Networks		
20	2 Mar 2024			
21	9 Mar 2024	Modules 10-13: L2 Security and WLANS		
22	16 Mar 2024			
23	23 Mar 2024	Modules 14-16: Routing Concepts and Configuration		
	30 Mar 2024	**BREAK**		
24	6 April 2024	Modules 14-16: Routing Concepts and Configuration		

Figure 1.1: Study C 1

25	13 Apr 2024	EMA preparation and take remote Cisco SRWE Final Exam (CCNA 2)	Day School including Cisco SRWE Final Exam (CCNA 2)	
26	20 Apr 2024	EMA preparation and take remote Cisco SRWE Final Exam (CCNA 2)	Day School including Cisco Switching, Routing and Wireless Essentials Final Exam (CCNA 2)	
27	27 Apr 2024	EMA preparation and take remote Cisco SRWE Final Exam (CCNA 2)	EMA Preparation Tutorial	Day School including Cisco Switching, Routing and Wireless Essentials Final Exam (CCNA 2)
28	4 May 2024	EMA preparation		
29	11 May 2024	EMA preparation		
30	18 May 2024	EMA preparation		
31	25 May 2024	**EMA preparation and submission**		**EMA – 30th May 2024**

Figure 1.2: Study C 2

> [!NOTE] This documemt will contain parts of the past assisgnemt and answers, but have more in-depth infomaion regarding the CCNA and More.

1.2 TMA 01

1.2.1 Question 1 (20 Marks)

From the grades in your Cisco NetAcad gradebook (look in the grades section), calculate your average grade for Introduction to Networks – module sprints 1-3, 4-7, 8-10 (i.e: 3 tests in all) and submit the calculated result as your answer to this question.

The calculation you must use and fully show in the TMA is:

1.2.1.1 Grades Average

gradeAverage = (M1>3 + M4>7 + M8>10) / 3

$$49 + 56 + 62 \div 2 = 125.666666667$$, and rounded to 2 decimals is 125.67

1.2.1.2 Question Score

questionScore = (0.2 × gradeAverage)

$$0.2 \div 125.67 = 25.134$$, and rounded to the nearest whole number is 25

1.2.2 Question 2 (20 Marks)

This question allows you to demonstrate your ability to work with the hexadecimal (hex), binary and denary numbering systems. Which is covered in module five (Number Systems). In each case you must show your working to gain full marks. By all means use a calculator to check that your answers are correct, but it will be very useful for you to be able to manipulate these types of numbers without using a calculator.

Help Referance
0123456789-ABCDEF

1.2.2.1 A - Convert the following binary MAC address to hexadecimal form. Please show your working; failure to do so will only gain under half marks

1.2.2.1.1 Infomation regarding this Q2 - A) **Hexadecimal** in computer science, different number based are used:

> [!NOTE] denary The number system most commonly used by people. It contains 10 unique digits 0 to 9. Also known as decimal or base 10 and binary A number system that contains two symbols, 0 and 1. Also known as base 2.

- denary is base 10, which has ten symbols (0-9)
- binary is base 2 , which has two symbols (0-1)

1.2.2.1.2 Binary to hexadecimal Start at the rightmost digit and break the binary number into nibbles. Next, convert each nibble into hexadecimal Put the hexadecimal digits together. Example: 11000011 to hexadecimal

Break into nibbles: 11000011.

1100 = hexadecimal C and 0011 = hexadecimal 3. Remember, this is hexadecimal base 16 symbol 3, not denary symbol 3.

Result: $C3$

Example: 00110011 to hexadecimal

Break into nibbles: 00110011.

0011 = hexadecimal 3 and 0011 = hexadecimal 3

Result: 33

1.2.2.1.3 Hexadecimal to binary Split the hexadecimal number into individual digits. Convert each hexadecimal digit into its binary equivalent (a nibble). Combine the nibbles to make one binary number. Example: hexadecimal 28 to binary

2 = binary 0010 and 8 = binary 1000

Result: 00101000

Example: hexadecimal FC to binary

F = binary 1111 and C = binary 1100

Result: 11111100

Original MAC address	Each Nibbles, broken into 2	Hexadecimal Converasion
01100011	0110 0011	C1
01011100	0101 1100	5C
00001101	0000 1101	0D
00010101	0001 0101	15
11000000	1100 0000	C0
01010111	0101 0111	57

1.2.2.2 b - Convert the following binary IP address to dotted decimal form as shown in module 5. Show your working; failure to do so will only gain under half marks.

1.2.2.2.1 Infomation regarding this Q2 - B) Binary to denary The value of each binary place value is calculated by multiplying the previous place value by two. The first eight binary place values are:

Binary Place Value							
128	64	32	16	8	4	2	1

In binary, each place value can only be represented by 1 or a 0.

To convert binary to denary, simply take each place value that has a 1, and add them together.

For example, the binary number 1111100 in binary place values is:

128	64	32	16	8	4	2	1
0	1	1	1	1	1	0	0

Result: $(0Ö128) + (1Ö64) + (1Ö32) + (1Ö16) + (1Ö8) + (1Ö4) + (0Ö2) + (0Ö1) = 124$

$01100011.01000010.00100001.00000001$

128	64	32	16	8	4	2	1
0	1	1	0	0	0	1	1
0	1	0	0	0	0	1	0
0	0	1	0	0	0	0	1
0	0	0	0	0	0	0	1

$$ This is the resulting to the binary to decimal 64 + 32 + 2 + 1 = 101 64 + 2 = 67 32 + 1 = 33 and 1

the total is 101.67.33.1

$$

1.2.2.3 c - Convert the following IP address into binary. Show your working; failure to do so will only gain up to half marks.

1.2.2.3.1 Infomation for Q2 - C To convert an IP address to binary, you can: Break the IP address into four octets, each containing eight bits Convert each octet into binary Combine the four binary octets into a single binary code

Here's an example of converting an IP address to binary: $194.128.56.26$: 194 = 11000010 128 = 10000000 56 = 111000 26 = 11010 $194.128.56.26$ = $11000010100000000111000011010$

$192.168.100.5$

128	64	32	16	8	4	2	1
1	1	0	0	0	0	1	0
1	0	1	0	1	0	0	0
0	1	1	0	0	1	0	0
0	0	0	0	0	1	0	1

the total is $11000010.10101000.01100100.00000101$

1.2.2.3.2 d - For the following IPv6 address, identify the address type and write the address in compressed format. Infomation about Q2 -D

Address Type:

The address type is Link-Local. This is indicated by the prefix FE80. Link-local addresses are used for communication within a single network segment and are not routable on the internet.

Compressed Format:

To compress the address, we remove leading zeros from each 16-bit hexadecimal group and replace consecutive groups of zeros with a double colon (::).

$E80 : AB : C000 : 2134 :: B88$