

## **WARNING**

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|-----------------|------------------|
| Family Name     |                  |
| Given Names     |                  |
| Student Number  |                  |
| Teaching Period | Semester 1, 2017 |

|  |  |               |                   |               |                    |
|--|--|---------------|-------------------|---------------|--------------------|
| <b>FINAL EXAMINATION</b>                           | <b>DURATION</b>  |               |                   |               |                    |
| <b>HIT172 – Operating Systems and Applications</b> | <table border="1"> <tr> <td>Reading Time:</td> <td><b>10</b> minutes</td> </tr> <tr> <td>Writing Time:</td> <td><b>180</b> minutes</td> </tr> </table> | Reading Time: | <b>10</b> minutes | Writing Time: | <b>180</b> minutes |
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| Writing Time:                                      | <b>180</b> minutes   |               |                   |               |                    |

### INSTRUCTIONS TO CANDIDATES

1.1 The examination has **3** sections

|                                      |  |
|--------------------------------------|--|
| <b>Section A:</b><br>Suggested Time: | <b>Multiple Choice Questions:</b> Answer ALL 25 questions<br>50 minutes Marks:30 |
| <b>Section B:</b><br>Suggested Time: | <b>Short Answer Questions:</b> Answer ALL 8 questions<br>80 minutes Marks:40     |
| <b>Section C:</b><br>Suggested Time: | <b>Mathematical Problems:</b> Answer ALL 2 questions<br>50 minutes Marks:30      |

1.2 Note that questions **ARE NOT** of equal value.

1.3 For **Section A:** Read **ALL** questions carefully. Questions must be answered on the answer sheet provided in **this** examination paper and **must be handed** in with your answer sheet booklet.

For **Section B and C:** Read **ALL** questions carefully. Questions must be answered in the Answer Booklet provided.

### EXAM CONDITIONS

**You may begin writing from the commencement of the examination session.** The reading time indicated above is provided as a guide only.

This is a CLOSED BOOK examination

No calculators are permitted

No handwritten notes are permitted

No dictionaries are permitted

| ADDITIONAL AUTHORISED MATERIALS             | EXAMINATION MATERIALS TO BE SUPPLIED |
|---|--------------------------------------|
| No additional printed material is permitted | 1 x 20 Page Book<br>1 x Scrap Paper  |

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DOUBLE-SIDED.**

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## Section B

### Short Answer Questions

**Total No of Marks for this section: 40**

This section should be answered in the Answer Booklet provided.

Marks for each question are indicated. Suggested Time allocation for Section B: 80 mins

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#### Question 1

(a) Being a network administrator you are asked to configure a small network of four new computers. Briefly explain starting from the installation phase till to the communication phase what are the basic steps you need to follow to build the network of four new computers.

(Marks: 3.0)

(b) What are the changes brought to the fourth generation computers in terms of technology, programming languages and operating systems?

(Marks: 2.0)

#### Question 2

(a) Describe briefly the differences between the 32 bit and 64 bit machines. What is the importance of virtualization to support running Windows XP based application on current operating system.

(Marks: 3.0)

(b) What is the technique used to support the mismatch between the processing speed of the PCs sending data to the printer for printing.

(Marks: 2.0)

#### Question 3

(a) In processing a single job which technique according to you will be efficient – multiprocessing or parallel processing. Explain why your chosen technique will give the better performance.

(Marks: 2.0)

(b) Name at least three services or features added to the latest operating system. Explain briefly the benefit that these three features bring to the user.

(Marks: 3.0)

#### Question 4

(a) Define briefly how the OS manage process from inactive state to final state. What is the technique used to prevent deadlock and starvation?

(Marks: 3.0)

(b) Explain any of the two algorithm used by the scheduler in selecting the job or process form a queue.

(Marks: 2.0)

### Question 5

(a) What is the difference between Public IPv4 address and Private IPv4 address? Explain how the hosts with private IPv4 can connect to the internet?

(Marks: 3.0)

(b) Define any two technologies which can be used to allow IPv6 network to communicate with an IPv4 network.

(Marks: 2.0)

### Question 6

(a) Explain with example how the client is assigned with static partial IPv6 address. You should also mention how the interface ID is generated in static partial assignment.

(Marks: 2.5)

(b) Explain briefly what these address represents -

- Link-local IPv6 Address
- Ipv4 address
- Subnet Mask
- Default Gateway
- Connection-specific DNS Suffix

(Marks: 2.5)

### Question 7

(a) There are four types of connection security rules which deal with authenticated and encrypted traffic. Explain any two connection security rules used to enhance the network security.

(Marks: 2.5)

(b) Define the process you need to follow when configuring a client for Direct Access. Explain briefly the most secure VPN protocol supported by Windows 7 and later operating systems.

(Marks: 2.5)

### Question 8

(a) While you create an account for logging in to the computer in a network you need to go through a number of policies in making your password secure. Explain briefly any three policies you will use to make your password secure.

(Marks: 3.0)

(b) What is the importance of EFS certificates? What are the tools used instead of credential manager to back up EFS certificates and how these tools in general back up existing EFS certificate.

(Marks: 2.0)

## **Section C**

### **Mathematical Problems**

**Total No of Marks for this section: 30**

This section should be answered in the Exam Paper. Use the Answer Booklet provided to solve the mathematical problems.

Marks for each question are indicated. Suggested Time allocation for Section B: 50 mins

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**Question 1**

- (a) Compare the two IP addresses using the given mask. Are they in same subnet?

| First IP Address | Second IP Address | Mask            | Same Subnet? |
|------------------|-------------------|-----------------|--------------|
| 172.182.0.31     | 172.182.1.100     | 255.255.255.129 |              |
| 192.158.1.37     | 192.158.1.176     | 255.255.255.0   |              |

(Marks: 2.0)

- (b) Convert the numbers and write down the equivalent base numbers in the bracket provided.

$$(525)_{10} = ( \quad )_{16}$$

(Marks: 1.0)

- (c) Convert the following binary number into dotted decimal notation

$$11101001\ 11111111\ 00010110\ 11110011 =$$

(Marks: 3.0)

**Question 2**

You work in an international IT company which is named ABC. As a network administrator you need to chop the whole network into a number of subnets. Given the network address and the number of subnets needed:

Number of subnets needed: 37

Network address: 182.186.120.0 / 24

Find:

- (a) Number of bits borrowed: \_\_\_\_\_
- (b) Total number of subnets available: \_\_\_\_\_
- (c) Total number of hosts/subnet: \_\_\_\_\_
- (d) Total number of usable hosts/ subnet: \_\_\_\_\_

(Marks: 4x2 =8.0)

(e) Write down the first three subnet address with slash notation.

| Subnet | Network Address | First Host IP | Last Host IP | Broadcast address |
|--------|-----------------|---------------|--------------|-------------------|
| 1      |                 |               |              |                   |
| 2      |                 |               |              |                   |
| 3      |                 |               |              |                   |

(Marks: 8.0)

(f) A user in Subnet 1 was trying to ping a user in Subnet 2 and the ping reply comes with the message “Destination Host Unreachable”. Explain what action you should take in order to solve the problem.

(Marks: 4.0)

(g) Below is an IPv6 Extended Unique Identifier (EUI) Interface ID generated using the MAC ID. Write down the MAC address/ number in the bracket given.

3FCD: 1BFF: FECD: ABCD = [                          ]

(Marks: 4.0)



**Student ID:**

**Answer Sheet for Section A**

|            |            |            |            |            |
|------------|------------|------------|------------|------------|
| <b>Q1</b>  | <b>Q2</b>  | <b>Q3</b>  | <b>Q4</b>  | <b>Q5</b>  |
| <b>Q6</b>  | <b>Q7</b>  | <b>Q8</b>  | <b>Q9</b>  | <b>Q10</b> |
| <b>Q11</b> | <b>Q12</b> | <b>Q13</b> | <b>Q14</b> | <b>Q15</b> |
| <b>Q16</b> | <b>Q17</b> | <b>Q18</b> | <b>Q19</b> | <b>Q20</b> |
| <b>Q21</b> | <b>Q22</b> | <b>Q23</b> | <b>Q24</b> | <b>Q25</b> |