



THE UNIVERSITY OF THE WEST INDIES

Semester I ☐ Semester II ☒ Supplemental/Summer School ☐

Examinations of December ☐ April/May ☒ July ☐ 2013

Originating Campus: Cave Hill ☐ Mona ☒ St. Augustine ☐ Open ☐

Mode: On Campus ☒ By Distance ☐

Course Code and Title: **COMP2190 – Net Centric Computing**

Date: **May 15, 2013**

Time: **9 am**

Duration: **2 Hours**

Paper No: **1**

Materials required:

Answer booklet: Normal ☒ Special ☐ Not required ☐

Calculator: Programmable ☐ Non-Programmable ☒ Not required ☐
(where applicable)

Multiple Choice
answer sheets: numerical ☐ alphabetical ☐ 1-20 ☒ 1-100 ☐

Auxiliary/Other material(s): None

Instructions to Candidates: This paper has 6 page(s) and 5 questions

Candidates are reminded that the examiners shall take into account the proper use of the English Language in determining the mark for each response.

Answer all questions in Sections 1 and 2 and any two (2) from Section 3.

The maximum number of marks you may earn for the entire paper is **50**. The number in [] by each question indicates the number of marks allotted to the question. Justify all your answers; full credit will be given only for properly supported answers, partial credit will be given where applicable.

Please write legibly and keep your answers concise. Points will be deducted for correct answers that also include incorrect or irrelevant information. Good skill!

NB: This paper may not be removed from the examination room.

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INSTRUCTIONS: Each page must be signed by the First and Second Examiners, and where applicable the University and External Examiners. Completed forms should be handed to the Assistant Registrar (Examinations). Where applicable the EXTERNAL EXAMINER is requested to sign the question paper and return it with comments, if any, (on a

Section 1**Question 1** *10 multiple choice sub-questions* [10]

OVER...

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Section 2

Question 2 [20]

- a. Suppose Host A sends two TCP segments back to back to Host B over a TCP connection. The first segment has sequence number 90; the second has sequence number 110.
- How much data is in the first segment? [1]
 - Suppose that the first segment is lost, but the second segment arrives at B. In the acknowledgement that Host B sends to Host A, what will be the acknowledgement number? [2]
- b. (i) Suppose Host A sends to Host B a TCP segment encapsulated in an IP datagram. When Host B receives the datagram, how does the network layer in Host B know it should pass the segment (that is, the payload of the datagram) to TCP rather than to UDP or something else? [2]
- (ii) A router has the following CIDR entries in its routing table:
- | Address/mask | Next hop |
|----------------|-------------|
| 135.46.56.0/21 | Interface 0 |
| 135.46.60.0/22 | Interface 1 |
| 192.53.40.0/23 | Interface 2 |
| default | Interface 3 |
- For each of the following IP addresses, what does the router do if a packet with that address arrives?
- 135.46.63.10 [1]
 - 192.53.42.14 [1]
- c. Suppose nodes A, B, and C each attach to the same broadcast LAN through their adapters). If A sends thousands of IP datagrams to B with each encapsulating frame addressed to the MAC address of B, will C's adapter process these frames? If so, will C's adapter pass the IP datagrams in these frames to the network layer at C? How would your answers change if A sends frames with the MAC broadcast address? [4]
- d. (i) What is one common application for IPsec? [1]
- (ii) Suppose Alice sends packets to Bob using TCP over IPsec. If the TCP acknowledgement from Bob is lost, then the TCP sender at Alice's side will assume the corresponding data packet was lost, and thus retransmit the packet. Will the retransmitted TCP packet be regarded as a replay packet by IPsec at Bob's side and be discarded? Please briefly explain your answer. [4]
- e. (i) Write XHTML for a link element that displays the text "Click here" and has a target URL that uses the HTTP scheme with host name "www.abc.edu.jm", hierarchical portion "/level/2/courses", and a query value: "discipline" with value "info". [2]
- (ii) Indicate whether the following statement is True or False, AND explain your answer. Web browsers are stateless: if a browser isn't displaying a page for a particular server it need not retain any state related to that server. [2]

OVER...

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Section 3

Question 3 [10] You plug in a new laptop into a wired Ethernet jack for the first time. You can join this network with no further action on your part. Write down the series of packet exchanges that will occur on the link for your laptop to send a single IP packet to 196.4.3.1. [10]

Assume that:

- a. your DHCP server is 196.3.7.77
- b. your DNS server is 196.3.7.77
- c. the IP address you'll be given is 196.3.7.22
- d. your Ethernet address is 00:11:22:33:44:55
- e. the default gateway IP address is 196.3.7.1
- f. the netmask is 255.255.255.0

Question 4 [10]

- a. What are the differences between message confidentiality and message integrity? Can you have confidentiality without integrity? Can you have integrity without confidentiality? Justify your answer. [5]
- b. Consider RSA with $p = 5$ and $q = 7$
 - (i) What are n and z ? [1]
 - (ii) Let $e = 11$. Why is this an acceptable choice for e ? [2]
 - (iii) Find d such that $de \bmod z = 1$ and $d < z$. [2]

Question 5 [10]

- a) The HTML fragment below can be rendered by all popular browsers, but is not valid XHTML. Please rewrite the HTML as a valid XHTML fragment. [5]

```

1      <p>Computing has been taught at UWI-Mona since the late 1970s.
2      <p>Recent heads of the Department of Computing<br>
3      <ol>
4          <li>Ezra K. Mugisa
5          <li>Daniel N. Coore
6          <li>Ezra K. Mugisa
7      </ol>
```

- b) What is MySQL? [1]
- c) What is the purpose of the `mysql_select_db` function? [2]
- d) What is the purpose of the `mysql_query` function? [2]

END

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