

UNIVERSITY OF MALTA  
BOARD OF STUDIES FOR INFORMATION TECHNOLOGY/  
FACULTY OF SCIENCE

Department of Computer Science & A.I.

B.Sc. I.T.(Hons.)/B.Sc.(Hons.) Year II

June 2007 Assessment/Examination Session

CSA2100: Techniques in Operating systems      XXth June, 2007

X:XX-XX:XX

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*Read **ALL** questions before starting. Choose **two** questions out of the three provided. Each question carries 25 marks of the total grade.*

**Section A**

A

## Section B

4. (a) The minimum length of an IP datagram is 576 bytes of which there are 20 bytes allocated to the header. The size of the Ethernet header (including some junk) is 38 bytes long. What is the size of the Ethernet frame on the wire when 1 byte of data is transmitted from the IP layer?  
[5 marks]
- (b) Additionally, what is the maximum bandwidth achievable when transmitting data using IP on a 100Mbit Ethernet network?  
[8 marks]
- (c) Describe a technique that allows one to discover intermediate routers to a destination host.  
[7 marks]
- (d) Describe the slow start algorithm.  
[5 marks]
5. (a) A company has purchased 6 Class C IP network addresses: 193.188.34.0, 193.188.35.0, 193.188.131.0, 193.188.132.0, 193.188.195.0 and 193.188.241.0. While making use of subnetting, draw the network diagram and the routing tables on each router that would result in the smallest routing tables possible.  
[8 marks]
- (b) Explain the use of the ARP protocol and explain how it works.  
[7 marks]
- (c) Compare and contrast the distance vector routing algorithm and the link-state routing algorithm and give an example where each would be most appropriate.  
[10 marks]
6. (a) Explain how triggered updates reduce the convergence time of a router.  
[5 marks]
- (b) Explain a technique that avoids the counting to infinity problem.  
[8 marks]

(c) Describe a technique that allows private IP hosts to access public servers. Make sure you give all the details of how this technique works. Additionally explain how, when using this technique, private IP hosts still have certain limitations when compared to public IP hosts.

**[7 marks]**

(d) Describe how TCP Windowing is more efficient than a strict acknowledgement protocol.

**[5 marks]**

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