INSTITUTE OF TECHNOLOGY BLANCHARDSTOWN

Year	Year 2
Semester	Semester 1
Date of Examination	Wednesday 19 January 2011
Time of Examination	9.30am – 11.30am

Prog Code	BN002	Prog Title	Higher Certificate in Science in Computing	Module Code	COMP H2028
Prog Code	BN013	Prog Title	Bachelor of Science in Computing in Information Technology	Module Code	COMP H2028
Prog Code	BN104	Prog Title	Bachelor of Science (Honours) in Computing	Module Code	COMP H2028

Module Title	Operating Systems (Client)

Internal Examiner(s): *Ms. Marie Brennan*
External Examiner(s): *Dr. Richard Studdert*
Mr. John Dunnion

Instructions to candidates:

1) To ensure that you take the correct examination, please check that the module and programme which you are following is listed in the tables above.
2) Candidates should attempt ALL parts of question One in Section A
3) Candidates should attempt ONE question from Section B and ONE question from Section C.
4) This paper is worth 100 marks.
5) Question one is worth 40 marks and all other questions are worth 30 marks each.

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SECTION A: COMPULSORY QUESTION

Question 1: Answer all parts of this question (4 Marks each for each part)

a) In relation to Linux what entities create log files?

b) The following table contains data concerning **five** different processes when the *First-Come First-Served* scheduling algorithm is used (all processes are assumed to arrive at time 0 in the order Process #1, #2, #3, #4, #5):

Process No.	EST RUN TIME	Waiting Time
1	2	0
2	60	2
3	1	62
4	3	63
5	50	66

Using the same data, compile a similar table for the ***Shortest-Job First*** Scheduling algorithm.

c) List **four** objectives of a good process scheduling policy for an operating system.

d) Describe with the aid of a diagram the operation of a multi-level feedback queue with **four** levels.

e) What do the following commands in Linux display: **ps**, **pstree** and **ps aux.**

f) Explain the terms *Translation Look-aside Buffer* and *Associative Mapping.*

g) In relation to the 5-state Process Management Model indicate where you would use a short-term, medium-term and long-term scheduler. Use a diagram to illustrate your answer.

h) Explain the difference between a logical address and a physical address of a computer program.

i) Briefly describe what you might find in the following directories: **/Bin, /boot, /home, /tmp.**

j) Describe two files that you would find in the **/proc** directory.

Total (40 Marks)

SECTION B: ANSWER QUESTION 2 OR QUESTION 3

Question 2

a) List **four** events that lead to the creation of a process.

(4 marks)

b) Describe with the aid of a diagram the **5-State** Process Management Model. Include in your answer a description of each state, transitions between states and the reasons for those transitions.

(12 marks)

c) With the aid of a diagram describe **one** technique by which a process that is executing in user mode can request the kernels service.

(6 marks)

d) With reference to Linux describe the use of the **top** command. Give a brief description of information that is obtained from it execution.

(8 marks)

Total (30 Marks)

Question 3

a) What are the functions of the Operating Systems Memory Management?

(4 marks)

b) In relation to memory management, explain the following terms:
External Fragmentation, Internal Fragmentation, Resident Set.

(6 marks)

c) Describe **three** historical methods of memory management and the major drawbacks associated with each of these.

(9 marks)

d) Describe the contemporary method of simple paging. In your answer make reference to the mechanism of how a logical address is converted to a physical address with this method.

(11 marks)

Total (30 Marks)

SECTION C: ANSWER QUESTION 4 OR QUESTION 5

Question 4

a) What is the purpose of the FHS?

(6 marks)

b) Define two *independent* categories of files.

(6 marks)

c) With reference to the Linux operating system, describe the **/etc/passwd** and the **/etc/shadow** files under the following headings

i. their purpose
ii. what they contain

(8 marks)

d) Describe the steps involved in adding a new user to a Linux operating system.

(6 marks)

e) State briefly the function of the **/root** file system under the following headings:

i. Purpose
ii. rationale

(4 marks)

Total (30 Marks)

Question 5

a) What are Linux log files?

(5 marks)

b) Describe the **syslog** system under the following headings:

i. What it is?
ii. Components
iii. Operation

(12 marks)

c) List **four** common logging polices.

(4 marks)

d) Why would you need to archive log files?

(9 marks)

Total (30 Marks)