DUBLIN INSTITUTE OF TECHNOLOGY

BSc. (Honours) Degree in Computing

Year 1

SUMMER EXAMINATIONS 2014/2015

INTRODUCTION TO OPERATING SYSTEMS [CMPU1015]

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FRIDAY 22ND MAY   4.00 P.M. – 6.00 P.M.

TWO HOURS

ANSWER *QUESTION ONE* & TWO OTHER QUESTIONS.

QUESTION ONE IS *COMPULSORY* & CARRIES 50 MARKS.

ALL OTHER QUESTIONS CARRY 25 MARKS.

Question 1 - All sub questions have equal marks (5 marks each).

a) Explain what is the difference between a process and a program.

b) Explain what a thread is.

c) Name three contemporary Operating Systems.

d) Explain the term 'timeslicing'.

e) Unix uses a UFS which is a virtual file system. Explain how the UFS works in principle.

f) Explain the term 'thrashing'.

g) Explain 'deadlock'.

h) Explain what a 'register' is.

i) Explain 'cache'.

j) Explain what is 'non-pre-emptive scheduling'.

Question 2 - All sub questions have equal marks.

An Operating System has the following partitions:
Partition 2 is busy. Partition 1: 100K, Partition 2: 200K, Partition 3:300K and Partition 4: 400K.

a) Name the method (scheme) of organisation given to this predetermined memory allocation above.

(3 marks)

b) If a 100K process is to be loaded into memory
   i.   Which partition will be loaded under the first-fit memory allocation?

   (3 marks)

   ii. Which partition will be loaded under the best-fit memory allocation?

   (3 marks)

   iii. Which partition will be loaded under the worst-fit memory allocation?

   (3 marks)

c) Explain the two biggest disadvantages of this memory scheme.   *(8 marks)*

d) Explain what is 'compaction'.   *(5 marks)*

Question 3

    a) Is an Operating System (OS) an example of application software?   *(5 marks)*

    b) Explain in detail what an OS is?   *(10 marks)*

    c) Explain what the primary (management) functions of an OS are?   *(10 marks)*

Question 4

    a) Distinguish between a lightweight and a heavyweight process.   *(8 marks)*

    b) Explain what a multi-threaded Operating System (OS) is.   *(8 marks)*

    c) Distinguish between a 'monolithic' and 'micro-kernel' OS architecture.   *(8 marks)*

    d) Does Linux have a monolithic or micro-kernel OS architecture?   *(1marks)*