DUBLIN INSTITUTE OF TECHNOLOGY

DT211C BSc. (Honours) Degree in Computer Science (Infrastructure)

Year 1

WINTER EXAMINATIONS 2017/18

INTRODUCTION TO OPERATING SYSTEMS [CMPU1015]

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TUESDAY 16TH JANUARY   9.30 A.M. – 11.30 A.M.

Two hours.

INSTRUCTIONS TO CANDIDATES

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) Are Operating Systems user application software?

    b) Name three *types* of Operating Systems.

    c) Explain what *pre-emption* is in the context of a processor.

    d) Name two common *registers* in the context of a processor.

    e) Identity the three phases in a three-phase *instruction cycle* in the context of a processor.

    f) Explain what a *system call* is.

    g) Explain the difference between a *process* and a *thread*.

    h) .Explain the term *swapping* in relation to virtual memory.

    i) Explain the term *starvation* in relation to CPU scheduling.

    j) Explain two specific situations within the Operating Systems where *deadlock* occurs.

(Total 50 marks)

Question Two

a) Explain what the term *trashing* is, in the context of memory management.

(2 marks)

b) Compare and contrast *paging* and *segmentation*.

(10 marks)

c) Using a diagram, explain the relationship between *physical* memory and *logical* memory address space.

(10 Marks)

d) If in a *fixed* partition memory management system, the current value of the base register is 993 and the current value of the bounds register is 1010, compute the physical addresses that correspond to the logical address of 1041.

(3 Marks)
(Total 25 marks)

Question Three

a) Explain what the following two terms are in the context of the Operating System
    File System:
    i) File   *(3 marks)*
    ii) Directory   *(2 marks)*

b) What are the five major activities of an Operating System with regard to file
    management?

                                                                              (10 marks)

c) Name two types of File Systems associated with MS Windows.

                                                                              (10 marks)

d) Identify the command for MS Windows DOS and Linux that will detail the
    contents of the folder.

                                                                              (4 marks)
                                                                       (Total 25 marks)

Question Four

a) Outline briefly the elements of a *Process Control Block.* Support your answer
    with an appropriate diagram.   *(15 Marks)*

b) Identify two models of *inter-process communication* are available within
    Operating Systems?   *(5 Marks)*

c) Identify one strength and one weakness of the one of the approaches identified in
    part b) of this question.   *(5 Marks)*
                                                                       (Total 25 marks)