TECHNOLOGICAL UNIVERSITY DUBLIN
CITY CAMPUS - GRANGEGORMAN

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TU856 – BSc. (Honours) in Computer Science
TU858 – BSc. (Honours) in Computer Science (International)

Year 1
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SEMESTER 2
EXAMINATIONS 2023/24
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Operating Systems 1 [CMPU1002]

Dr. Martin O'Connor
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Exam Duration: 2 hours

**Instructions To Candidates: Answer ALL Four (4) Questions.
All questions carry equal marks.**

Please start each question on a new page.

Question 1   [25 Marks]

a) Explain what the following Linux/Bash commands do:

   (i)   grep   **(2 marks)**

   (ii)   cat   **(2 marks)**

   (iii)   rm   **(2 marks)**

   (iv)   du   **(2 marks)**

   (v)   df   **(2 marks)**

b) Explain what the following DOS commands do:

   (i)   mkdir   **(2 marks)**

   (ii)   copy   **(2 marks)**

   (iii)   cd   **(2 marks)**

   (iv)   ren   **(2 marks)**

   (v)   del   **(2 marks)**

c) Explain how a user invokes the Linux command *chmod* to change file permissions.   **(5 marks)**

Question 2 [25 Marks]

a) Discuss the advantages and disadvantages of a Command Line Interface in comparison to a Graphical User Interface.   **(10 marks)**

b) What are the fields in the Process Control Block (PCB)?
Provide an explanation for each field.   **(10 marks)**

c) Identify FIVE (5) reasons why a process may terminate.   **(5 marks)**

Question 3 [25 Marks]

a) Identify and explain FIVE (5) scheduling optimisation criteria that affect the choice of a CPU scheduling algorithm.   **(10 marks)**

b) Disk Partitioning is the act of dividing a drive into multiple logical storage units referred to as *partitions*.
Identify and explain FIVE (5) advantages of disk partitioning.   **(10 marks)**

c) Explain what is meant by the *producer-consumer problem*.   **(5 marks)**

Question 4   [25 Marks]

a) Explain what a Monolithic kernel-based Operating System is and discuss its

advantages and disadvantages. **(10 marks)**

b) Discuss the following physical *file access methods*:

    a. Sequential Access **(3 marks)**

    b. Random Access **(3 marks)**

    c. Indexed Access **(3 marks)**

c) What is a *race condition*? Briefly discuss why a race condition may occur and

how to prevent it. **(6 marks)**

<END OF EXAMINATION PAPER>