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TECHNOLOGICAL UNIVERSITY DUBLIN
KEVIN STREET CAMPUS

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

Year 2

SEMESTER 1 EXAMINATIONS 2019/20

Operating Systems and System Administration

Dr. Aneel Rahim
Dr. Deirdre Lillis
Dr. David Malone

Two Hours

Instructions to candidates

Answer   Questions 1 and any two others

Question 1 is worth 40 marks, all the rest are worth 30

1. **(a)** Describe the startup process of Linux environment. (5 marks)

   (b) Write a simple Linux script that will perform the operations below. (8 marks)

       i. Show the disk usage

       ii. Display the current date

       iii. Show the hidden files

       iv. Display the currently running processes

   (c) Describe the concept of distributed operating system and network operating system.

   (12 marks)

   (d) Explain the working of the following commands (15 marks)

       i. man cat

       ii. whoami

       iii. pwd

       iv. whatis man

       v. ls >> output.txt

2. **(a)** Describe the Unix tree Directory. Use a diagram to illustrate your answer. (8 Marks)

   (b) In relation to File system, explain the concept of file permission and file sharing using

   ftp protocol? (10 marks)

   (c) Explain the fork command and write a C program to differentiate between the parent

   process and child process. (12 marks)

3. (a) Explain the following in term of Memory Management. (12 marks)

    i.   Demand Paging

    ii.   Page copy on write (COW)

    iii.   Virtual Memory

(b) Discuss the concept of a semaphore, use a diagram to illustrate your answer. (6 marks)

(c) Explain the concept of livelock, starvation and priority inversion in relation to process

management. (12 marks)

4. (a) In relation to Kernel Management, explain how you can perform the following

operation. (12 marks)

    i.   Show message from kernel buffer.

    ii.   Remove module from kernel space

    iii.   Display information about a kernel module

(b) Explain the following commands in term of backup strategies. Use example to illustrate
your answer. (9 marks)

    i.   tar

    ii.   dump

    iii.   dd

(c) Discuss the login process and passwd file in term of system administration. (9 marks)