RAJARATA UNIVERSITY OF SRI LANKA
FACULTY OF APPLIED SCIENCES

B.Sc. (General) Degree in Information and Communication Technology
First Year Semester II Examination - April/ May 2015

ICT1308 – Operating Systems

Answer **any five (05)** questions — Time: **Three hours**

01 a. What are the two main functions of an operating system? Briefly explain each of these functions.

(05 Marks)

b. What is the purpose of the memory stack?

(05 Marks)

c. What is a pipeline? What is the difference between the pipeline design and a superscalar design?

(10 Marks)

02 a. Briefly explain the operation of cache.

(05 Marks)

b. What are the advantages of layered design of operating systems over monolithic design?

(05 Marks)

c. Briefly explain cloud computing.

(10 Marks)

03 a. "Multiprocessing introduces new challenges to the operating system". Do you agree with this statement? Justify your answer.

(10 Marks)

b. What are the principle events in which a process is created?

(05 Marks)

c. What are the differences in voluntary and involuntary process terminations?

(05 Marks)

04 a. Briefly describe each state of the "seven-state process model".

(10 Marks)

b. Discuss the three levels of scheduling.

(10 Marks)

05 a. What is a "race condition"? How can defining "critical regions" avoid the race conditions?

(05 Marks)

b. What is the "priority inversion problem"?

(05 Marks)

c. "Generally, deadlocks involve non-preemptable resources". Explain why?

(10 Marks)

06. a. Explain the problems of "protection" and "relocation" in memory management.

(05 Marks)

b. What is "swapping" in the context of memory management?

(05 Marks)

c. Discuss the concept of "virtual memory" and the use of page tables in implementing paging.

(10 Marks)

07 a. Elaborate the arrangement of a file system on a disk.

(05 Marks)

b. Briefly explain the advantages of Direct Memory Access (DMA)?

(05 Marks)

c. "Magnetic disks rotate at a constant speed while the rotational speed of optical disks vary during reading". Explain why?

(05 Marks)

d. Briefly explain what "cylinder skew" of a magnetic disk is and the purpose for cylinder skew.

(05 Marks)

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