EXTRA EXAM

Program: Computer Engineering
Course: Systems Performance Analysis
Professor: Alexandre Magno de Sousa
Student: _____

Second half of 2015
Date: December 3rd, 2015
Value: 10 points
Deadline: December 9th, 2015

Remark: the got value in this exam will be added to value of first exam until 20 points. Make analysis of answers achieved, justifying the answers and then get the conclusions.

1. A database server has one CPU and one disk. Ther server's workload is composed of trivial queries that arrive at a rate of 10 tps, complex queries that arrive at a rate of 0.1 tps, and of a batch workload that generates a report. When the report generation completes, a new report generation is started in 15 minutes. Table 1 provides workload related information. Each physical I/O demands 0.015 msec of CPU time and 9 msec of disk service time. The last row of Table 1 indicates how much CPU time is required by transactions of each workload in addition to the CPU time related to I/Os.

   - What kind of QN should be used to model this situation? Specify the type of workload, resources and network.
   - Find the average response time and the average throughput for each of the three workloads.
   - Find the utilization of the CPU and of the disk.
   - Finds the residence times at the CPU and at the disk for each of the three workloads.

Tabela 1: Data for exercise.

Workload	Trivial	Complex	Report
Avg. Number of SQL Calls	3.5	20.0	120.0
Avg. Number of I/Os per SQL Call	5.0	15.0	40.0
DB Buffer Hit Ratio (in %)	70.0	80.0	30.0
Non I/O Related CPU Time (msec)	30.0	180.0	1250.0

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