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First Semester M.Tech. Degree Examination, Dec. 2013/Jan. 2014
Computer System Performance Analysis

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions.

- 1
 - a. Compare the three techniques for performance evaluation against the seven criteria for selection. (07 Marks)
 - b. Write the ten steps for a systematic approach to performance evaluation. (05 Marks)
 - c. Define nominal capacity and usable capacity of a system. (04 Marks)
 - d. Based on utility classification, state the different classes of performance metrics with examples of each class. (04 Marks)
- 2
 - a. Discuss the three types of benchmarks, with examples. (06 Marks)
 - b. Write and explain the sieve Kernel algorithm. (04 Marks)
 - c. How do you measure the performance of a banking application using debit credit benchmark? (05 Marks)
 - d. What are the ten components of spec 1.0? (05 Marks)
- 3
 - a. Depending upon the level of implementation, what are the 4 types of monitors used in performance measurement? (04 Marks)
 - b. What are the issues in software monitor design? (08 Marks)
 - c. Explain the stages in distributed system monitor along with the functionality of each stage. (08 Marks)
- 4
 - a. What are the steps in capacity planning? (05 Marks)
 - b. Discuss the problems in capacity planning. (05 Marks)
 - c. What is an RTE? (04 Marks)
 - d. Discuss the three phases of operation of RTE when measuring the performance of SUT. (06 Marks)
- 5
 - a. Explain the following four terminologies in the context of experimental design :
 i) Response variable ii) Factor iii) Level iv) Interaction. (08 Marks)
 - b. Find the number of experiments you have to perform using full factorial design for 4 factors each at 3 levels. (04 Marks)
 - c. For a 2^2 design, the variation can be divided into 3 points :
 $SST = 2^2 q_A^2 + 2^2 q_B^2 + 2^2 q_{AB}^2$
 Deduce the equation. (08 Marks)
- 6
 - a. What are the six characteristics of a queuing system? (06 Marks)
 - b. Prove Little's law. (06 Marks)
 - c. Explain the four types of stochastic processes. (08 Marks)
- 7
 - a. Find the expression for steady state probability of being in state n for a birth and death process in terms of arrival rate, service rate and P_0 . (12 Marks)
 - b. For a M/M/1 queuing system define the term traffic intensity P and find the expression for steady state probability of being in state n, in terms of P. (08 Marks)
- 8

Write short notes on :

 - a. Single and multi parameter histogram
 - b. Markov model
 - c. Central server queuing model of a timesharing system
 - d. Open, closed and mixed queuing networks. (20 Marks)