

FEDERAL UNIVERSITY OF TECHNOLOGY OWERRI
DEPARTMENT OF COMPUTER SCIENCE
RAIN SEMESTER EXAMS, 2018/2019 SESSION,
CSC508: SYSTEM PERFORMANCE EVALUATION

Date: 21/10/2019

Section A: Attempt all questions. Encircle the alphabetic label of the most correct answer. Time: 40 mins.

Student Name: _____ **Student Reg No.** _____

1. System performance evaluation is a disciplined inquiry because the requirement is/are:
A. Theoretical and practical knowledge of system analysis methods
B. System Performance modeling skills. C. Knowledge of hardware, software, and interoperability of computer systems. D. All of the above
2. The field of study that focuses on the production of high-performance software systems is
A. Automated Software Engineering B. Knowledge-based Software Engineering
C. Software Performance Engineering D. Software Metrics
3. The features of a certain disk are advertized by the manufacturer as follows: rotational speed is 5400 rpm; average seek time is 12 ms; data transfer rate is 5MB/s; controller overhead is 2 ms. Determine the time (in ms) that it would take to read or write 512-byte sector, assuming that the disk is idle so that there is no waiting time. A. 25.3 B. 19.7 C. 18.6 D. 14.0
4. In a batch processing system the degree of multiprogramming is $N = 5$. Using an appropriate performance model for workload, the average elapsed time is 25.26 sec. What is the average system throughput?
A. 5.05 sec/job B. 5.05 jobs/sec C. 0.20 sec/job D. 0.20 jobssec.
5. Which of the following parameters is peculiar to interactive systems? A. Think time
B. Average arrival rate C. Average degree of multiprogramming D. All of the above
6. A database server has a 25-MIPS CPU. Execution of commands at the server takes on the order of 100,000 instructions. The service demand at the server CPU (in seconds) is
A. 4.0×10^3 B. 4.0×10^{-3} C. 2.4×10^3 D. 2.4×10^{-3}
7. The performance of a computer system does on depend critically on
A. Logical requirements B. Physical design C. Installed software
D. Number of installed intelligent terminals
8. The performance of a computer system is measured in terms of its
A. Response time B. Throughput C. Workload and CPU utilization
D. None of the above
9. The performance of one of the following cannot be studied using single-server queue model
A. I/O data transfer channels B. Client-server system C. Network transmission protocol bus.
D. None of the above
10. Which of the following software can be used to predict the capacity of new computer systems?
A. Compiler B. Benchmark C. Unisys/Software Instrumentation Package
D. IBM/ System Management Facility
11. At steady state it is found that the throughput of a system modeled as a single-queue server is 0.3 and the average service rate is 0.5. What is the % idle time? A. 40% B. 60% C. 30% D. 50%
12. Which of the following theories is not applied in system performance modeling? A. Prediction theory
B. Probability theory C. Queuing system theory D. None of the above.
13. One of the following systems employs memory buffers for performance improvement
A. Disk I/O interface B. DBMS C. Operating systems D. All of the above
14. Suppose a transaction processing system is monitored for 1 hour and during this period 5400 transactions are processed. What is the utilization of a disk that has an average service time of 30 msec and that is visited 3 times on the average by every transaction?
A. 0.03 B. 0.09 C. 0.135 D. 0.045
15. The average delay experienced by a packet when traversing a computer network is 100 msec. The average number of packets that cross the network per second is 128 packets/sec. What is average number of packets in transit in the network? You may use the formulas: $Avg. delay = \lambda / (\mu - \lambda) * 1/\mu$; $Pkts\ in\ transit = \lambda / (\mu - \lambda)$.
A. 14 B. 12 C. 13 D. 10

16. Computer system performance evaluation may result to upgrading the key components except
 A. CPU and disk i/o system B. System/Applications Software
 C. Data transmission facilities D. None of the above
17. One of the following statements is not true
 A. System administrators tend to be concerned with ensuring that the system exhibits high throughput
 B. Users are more concerned with system response time. C. As system throughput increases, the response time decreases. D. None of the above.
18. Which of the following tools can be used for computer system procurement studies and comparative analysis of products? A. Compilers B. Benchmarks C. Expert systems
 D. Automated Model builders
19. One of these is a reason that necessitates capacity planning of computer systems
 A. Decrease in productivity or quality of service B. User dissatisfaction
 C. Risk of financial losses D. All of the above
20. In a certain computer system, the measured service demands for the major components are: 64% for the CPU, 90% for disk1, and 50% for disk2. Which of the components is a bottleneck in the system?
 A. CPU B. Disk 1 C. Disk 2 D. None
21. One of these software systems can be used to automate the process of system performance analysis and evaluation: A. DBMS C. Real-time operating system C. System Instrumentation Package D. Expert Systems
22. An interactive computer system has 40 terminals and an average (user) think time of 15 seconds. What is the response time (in seconds) if 7200 transactions are processed in 1 hour?
 A. 5.0 B. 20 C. 35 D. 0.05
23. One of the following statements is not true. A. Software parameters that affect system performance include maximum degree of multiprogramming and CPU dispatching priority.
 B. Hardware performance parameters include processor speed, disk latency and transfer rate, and network speed. C. The output of performance models include throughput, response time, and resource utilization D. None of the above
24. Which of these formulas can be used to calculate system response time if the average arrival rate is λ and the average service time is s ? A. $s/(s - \lambda s)$ B. $s/(1 - \lambda s)$ C. $1/(1 - \lambda s)$ D. $1/(s - \lambda)$
25. Suppose after the calibration of performance prediction model of a bank teller server system, the average arrival rate λ , and the average service rate μ are given as $\lambda = 0.267 + 0.044 * m$ jobs/sec. $\mu = 1.081 + 0.013 * m$ jobs/sec, where m denotes months ahead. Find the response time (in sec) when $m = 20$. A. 5.91 B. 5.15 C. 0.19 D. Undefined
26. Assume that jobs arrive at a printer server at an average rate λ and the average service rate is μ . For single-server queue model, what is the number of jobs waiting to be served?
 A. λ/μ B. $\lambda/(\mu - \lambda)$ C. $1/(\mu - \lambda)$ D. $\mu - \lambda$
27. One of the following is not computer system performance evaluation parameter
 A. Throughput B. Response time C. Mean time before failure D. None of the above
28. A certain batch system is used for processing parts shipment orders. Suppose an average of 12000 orders are processed within a batch window of 6 hours per day. What is the system throughput in orders per hour?
 A. 667 B. 2000 C. 3000 D. None of the above
29. Which of the following statements is true about performance models?
 A. They may be used to represent existing systems and the test parameters are obtained by measurement
 B. They may be used to represent new computer systems and the test parameters are estimated or randomly generated C. The purpose of model building is to determine the effects of the various model parameters on performance measures. D. All of the above .
30. One of the following is not a feature of multiprocessing environment in high-performance computer systems A. Common global memory and common bus arbiter B. The processors are interconnected using multistage interconnection network C. Multiprocessing is only employed in scientific computing D. The single operating system coordinates the operations of the entire system.