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14SCS11

First Semester M.Tech. Degree Examination, Dec.2014/Jan.2015
Advances in Operating Systems

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions.***

1 a. With a neat diagram of five – state process model, briefly explain each state and the associated possible transition. **(10 Marks)**

b. Discuss the five principal storage management responsibilities necessary for the efficient and orderly control of storage allocation. **(10 Marks)**

2 a. List the kernel mode components of windows. Also explain any five components of the executive module of windows operating system. **(10 Marks)**

b. Explain the key design issues of multiprocessor operating system. **(10 Marks)**

3 a. Draw the windows thread states and explain each state and their transition. **(10 Marks)**

b. Explain the virtual memory addressing and page replacement algorithm in Linux memory management. **(10 Marks)**

4 a. Discuss the four classes of real – time scheduling algorithms. **(08 Marks)**

b. Discuss in detail, the design issues of multiprocessor scheduling. **(08 Marks)**

c. Explain the distributed dead lock. **(04 Marks)**

5 a. With respect to computer security threats, describe any two kinds of threat consequences and the kinds of attacks that result in each consequence. **(10 Marks)**

b. Explain the classification and categories of viruses by target and by concealment strategy. **(10 Marks)**

6 a. Explain any four characteristics of embedded operating systems. **(08 Marks)**

b. Explain the two scheduler designs of e Cos. **(08 Marks)**

c. Explain the organization of virtual address space of each process created by Linux operating system. **(04 Marks)**

7 a. Explain the four different mechanism by which a user process can perform IPC using Linux kernel. **(10 Marks)**

b. With a neat block diagram, explain the windows NT, executive process and thread manager. **(10 Marks)**

8 a. With a neat diagram, describe the steps followed by a cache manager of windows NT executive in cached read operation. **(10 Marks)**

b. Compare the multithreading versus symmetric multiprocessing. Also discuss the potential advantages of SMP over uniprocessor. **(10 Marks)**

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14SCS/SCE12

First Semester M.Tech. Degree Examination, Dec.2014/Jan.2015
Cloud Computing

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions.***

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

1 a. Define cloud computing. Explain the different types of delivery models in a cloud, with a neat diagram. **(10 Marks)**
b. With the neat diagram, explain the components of windows azure. **(10 Marks)**

2 a. Explain the concept of interoperability in cloud. **(08 Marks)**
b. Define SLA. List the objectives of SLA. **(06 Marks)**
c. What are the challenges for licensing software in cloud computing? **(06 Marks)**

3 a. Briefly explain different workflow patterns in a cloud. **(10 Marks)**
b. With the architecture, explain the map-reducing programming model. **(10 Marks)**

4 a. What is the need of layering and virtualization in cloud? Explain with architecture. **(10 Marks)**
b. What are the problems faced by virtualization of the x86 architecture. **(06 Marks)**
c. Write the difference between CPU virtualization and memory virtualization in an x86 – 64 Itanium processor. **(04 Marks)**

5 a. Explain two – level resource allocation architecture based on control theory concept for the cloud. **(06 Marks)**
b. Briefly explain ASCA combinational auction algorithm with a schematic block diagram. **(08 Marks)**
c. Explain the approach for co-orientating power and performance management in cloud. **(06 Marks)**

6 a. What are the different classes of risk in cloud for providing security? **(08 Marks)**
b. With a neat diagram, explain virtual security services provided by vmm. **(08 Marks)**
c. List the various design goals of X_{oar}. **(04 Marks)**

7 a. Explain security rules for application and transport layer protocols in EC2. **(10 Marks)**
b. What are the software packages used to install Hadoop on eclipse on a windows systems? Write the pre requisites and SSH installation. **(10 Marks)**

8 Write a short notes on the following :
a. Cloud computing in Google perspective
b. Software fault isolation
c. The Grep the web application
d. Pricing and allocation algorithm. **(20 Marks)**

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14SCS13

First Semester M.Tech. Degree Examination, Dec.2014/Jan.2015
Advances in Database Management Systems

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions.***

1 a. Why are : i) Tuples in a relation not ordered
ii) Duplicate tuples are not allowed in a relation. **(04 Marks)**

b. Justify the following statements :
i) Handling NULL values is difficult
ii) Relation must have a key. **(06 Marks)**

c. List and explain the update operations on relations and constraint violations during there operations. **(10 Marks)**

2 a. What is the need for OO databases? List and explain the advantages of OODB approach. **(06 Marks)**

b. What is an object identifier (OID)? What primary characteristics an OID should process? Explain how OID differs from primary key. **(06 Marks)**

c. What are type constructors in OODBs? How are they used to create complex object structures? Represent the PROJECT entity of company database as complex object. **(08 Marks)**

3 a. Differentiate the following with respect to OO model with an example for each :
i) Overloading and overriding
ii) Structured and unstructured complex objects
iii) Polymorphism and dynamic binding
iv) Persistent object and transient object. **(08 Marks)**

b. Discuss the ODL and OQL concepts of ODMG model with an example for each. **(08 Marks)**

c. Write a note on nested relational features of oracle. **(04 Marks)**

4 a. What are the motivations behind parallel and distributed databases? **(05 Marks)**

b. Describe the three main architectures for parallel DBMSs. **(09 Marks)**

c. Differentiate pipelined parallelism and data-parallelism with example. What do we need to consider in optimizing queries for parallel execution. **(06 Marks)**

5 a. Define :
i) Distributed data independence
ii) Distributed transaction atomicity
iii) Homogeneous distributed databases
iv) Heterogeneous distributed databases. **(06 Marks)**

b. Describe the main architectures for distributed DGMSs. **(09 Marks)**

c. Discuss the data fragmentation and replication methods of storing data in distributed databases. **(05 Marks)**

6 a. What are decision support applications? Discuss the relationship of complex SQL queries, OLAP, data mining and data warehousing. **(06 Marks)**

b. Describe the multidimensional data model. Differentiate :
i) Measures and dimensions
ii) Fact tables and dimension tables. **(06 Marks)**

c. Discuss the SQL : 1999 ROLLUP and WINDOW features. **(08 Marks)**

7 a. Why are views important in data warehousing and OLAP? What are the main issues to consider in maintaining materialized views? Discuss how to use materialized views to answer a query. **(08 Marks)**

b. Define :
   i) Association rule
   ii) Support
   iii) Confidence
   iv) Sequential pattern. **(04 Marks)**

c. Describe an incremental algorithm for computing frequent item sets. **(08 Marks)**

8 a. What is a trigger? Explain the general model of a Trigger with an example. **(04 Marks)**

b. Briefly discuss the concepts and how querying is done in :
   i) Temporal databases
   ii) Spatial databases. **(08 Marks)**

c. Write a note on :
   i) Deductive databases
   ii) Multimedia databases. **(08 Marks)**

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14SCS14

First Semester M.Tech Degree Examination, Dec.2014/Jan.2015
Multicore Architecture and Programming

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions.***

1 a. What are the motivations for concurrency in software? Discuss the reasons for concurrency in software is important. **(05 Marks)**
b. Describe the Flyxn's taxonomy and classification. **(08 Marks)**
c. What is Virtualization? Describe the different virtualizations used in modern computers. **(07 Marks)**

2 a. Describe the different decomposition techniques with example. List the implications of decomposition techniques. **(10 Marks)**
b. What is error diffusion? Explain the steps involved in error diffusion algorithm with example. **(10 Marks)**

3 a. What are the principles used to perform synchronization? Explain them with necessity pseudocodes. **(10 Marks)**
b. Describe the different models of message passing in the context of multi threading environment. **(06 Marks)**
c. Define the following : i) Fence ii) Barrier. **(04 Marks)**

4 a. Describe the different parameters for the basic thread creation mechanism Create Thread ( ) provided by the Microsoft. **(10 Marks)**
b. Write a code for communicating between threads by using windows events. **(10 Marks)**

5 a. Write a note on :
i) Thread priority and ii) Processor affinity. **(10 Marks)**
b. Write a program to obtain the basic processes data from windows. **(05 Marks)**
c. Write a program to create fibers that print an identifying message to the console. **(05 Marks)**

6 a. What are the challenges in threading a loop? Explain any four. **(08 Marks)**
b. What is the need of minimizing threading overhead? List the measured costs of a set of open MP constructs on a 4 – way intel xeon processor based system. **(07 Marks)**
c. With diagram, explain the Intel Task queuing extension to open MP. **(05 Marks)**

7 a. What are the difficulties in debugging an Open MP program? Mention the guidelines for debugging Open MP program. **(06 Marks)**
b. In parallel programming model too many threads can degrade the performance. Discuss any five. **(10 Marks)**
c. What are the four conditions that may lead the dead lock to occur? **(04 Marks)**

8 a. Discuss the reasons for locks to be heavily contented. Explain the solutions for heavily contended locks. **(06 Marks)**
b. Describe any two issues of multi core processors suppose to take care about memory. **(10 Marks)**
c. Discuss the two rules that cover typical programming on IA 32 architecture. **(04 Marks)**

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14SCS152

First Semester M.Tech. Degree Examination, Dec.2014/Jan.2015
Advances in Storage Area Network

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions.***

1 a. Explain the storage centric IT architecture, with a neat diagram. Explain its advantages. **(08 Marks)**

b. Describe different cases where I/O channels can be designed with built-in redundancy. Which cable is best? **(08 Marks)**

c. How are the disk storage systems classified based on its complexity? Explain Just a Bunch Of Disks (JBOD). **(04 Marks)**

2 a. Explain briefly how parity blocks are calculated in RAID4 and RAID5. How RAID5 overcomes limitation of RAID4? **(08 Marks)**

b. With a neat block diagram, explain RAID0 and RAID1. Clearly bring out their important features. **(08 Marks)**

c. Describe the two types of caches that are designed to accelerate write and read accesses to physical hard disks. **(04 Marks)**

3 a. Explain briefly layers of FC protocol stack. **(08 Marks)**

b. Name the advantages and disadvantages of IP storage in relation to the fibre channel. **(08 Marks)**

c. With a neat sketch, explain the types of arbitrated loops. **(04 Marks)**

4 a. Compare fibre channel SAN, iscsl SAN and NAS with respect to storage networks. **(08 Marks)**

b. With a neat block diagram, describe the asymmetric storage virtualization. **(08 Marks)**

c. Explain the NAS software components. **(04 Marks)**

5 a. What is storage virtualization? Write the advantages and disadvantages of storage virtualization on the storage networks. **(08 Marks)**

b. Explain briefly general requirements and considerations for implementations of virtualization. **(08 Marks)**

c. Write any two advantages and disadvantages of storage virtualization on the server level. **(04 Marks)**

6 a. Define frame, sequence and exchange. Explain the classes of operation defined by the FC standard useful to data storage operations. **(08 Marks)**

b. Write a short note on:
i) JBOD ii) RAID iii) Bridges iv) Routers **(08 Marks)**

c. Discuss the following major components of a SAN:
i) Network port ii) Hardware port iii) Software port iv) Connectivity port **(04 Marks)**

7 a. What is zoning? With a neat diagram, explain SAN configuration with zoning and LUN masking. **(08 Marks)**

b. What is the need of a fibre channel switch? Explain the different types of ports defined by a FC switch. **(08 Marks)**

c. Explain any four components used to manage a storage network in management system. **(04 Marks)**

8 a. With a neat diagram, explain In-Band management service in the storage network. **(08 Marks)**

b. Explain SNMP architecture and its operations for the monitoring and configuration of managed devices. **(08 Marks)**

c. Compare CMIP and DMI protocol standards for out-band management. **(04 Marks)**

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