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(Following Paper ID and Roll No. to be filled in your Answer Book)

Paper ID : 210103 Roll No. | | | | | | | | | | |

M.Tech.

(SEM. I) THEORY EXAMINATION 2015-16

OPERATING SYSTEM & DBMS

[Time:3 hours] [Total Marks:100]

Note: Attempt questions from all Sections as per directions.

SECTION-A

Attempt **all** parts of this section. Answer in brief.(2×10=20)

1. (a) Define process.
   (b) What is Busy Waiting?
   (c) Differentiate Shell and Kernel.
   (d) What do you understand by System call?
   (e) What is the reason behind dual mode operation of processors?
   (f) "Redundancy of data is many times beneficial" Justify the statement.

   (g) Write down the features of DBMS.
   (h) Why are entity integrity and referential integrity important in a database?
   (i) Distinguish between functional dependency and multivalued dependency.
   (j) What are the various anomalies associated with RDBMS?

SECTION-B

Attempt **any five** questions from this section: (10×5=50)

2. Consider the database schema

   SUPPLIER (supp_id, supp_name, supp_add)

   PARTS (part_id, part_name, color)

   CATALOG (supp_id, part_id, cost)

   Write the following queries in Relational Algebra:

   (i) Find the name of suppliers who supply green parts.
   (ii) Find the name of suppliers who supply green and yellow parts.
   (iii) Find the name of suppliers who supply all parts.

3. What do you understand by normalization? Explain with suitable examples about third, fourth and fifth normal forms.

4. Explain about Distributed Operating System.

5. What do you mean by Tuple relational calculus and Domain relational calculus? Explain with suitable examples.

6. Explain the difference between Internal fragmentation and External fragmentation? Which one occurs in Paging system and which one occurs in system using pure segmentation?

7. Describe the Banker's algorithm for Safe allocation. Consider a system with five processes and three resource types and at time T the following snapshot of the system has been taken:

	Allocated			Maximum			Available		
Process Id	R1	R2	R3	R1	R2	R3	R1	R2	R3
P1	1	1	2	4	3	3	3	1	0
P2	2	1	2	3	2	2			
P3	4	0	1	9	0	2			
P4	0	2	0	7	5	3			
P5	1	1	2	11	2	3			

(i) Determine the total amount of resources of each type.

(ii) Compute the Need matrix

(iii) Determine if the state is safe or not using Banker's algorithm.

(iv) Would the following request be granted in the current state?

(a) P1<3, 3,1> (b) P2<2, 1,0>

8. Explain the following:

(i) Object Oriented DBMS.

(ii) Data Mining

(iii) Data Ware housing

9. Explain about the semaphores and show how the problem of Dining Philosopher's is solved by it.

SECTION-C

Attempt **any two** questions from this section: (15×2=30)

10. What are the differences between user level thread and kernel level threads? Under what circumstances is one type better than the other? What is the essential cause of the difference in cost between a context switch for kernel threads and a switch that occurs between user level threads?

11. What do you understand by File System? What is a Directory? Define any two ways to implement the directory.

12. How does SQL allow implementation of Entity Integrity and Regerential Integrity constraints? Explain about referential Triggered actions also.

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