CUMMINS COLLEGE OF ENGINEERING FOR WOMEN

(An Autonomous Institute affiliated to Savitribai Phule Pune University)

Third Year Electronics & Telecommunication

DATABASE MANAGEMENT SYSTEMS (SWAYAM ONLINE) (PEEC3201E)

Duration : 02:00 Hours | Max Marks : 50

Instructions :

1. All questions are compulsory.
2. Use of scientific calculator is allowed.
3. Draw diagrams wherever necessary.

Unit-1

Q No 1 a) (5)

What are mapping cardinalities and why are they used? Discuss their types in brief with suitable diagrams.

Unit-2

Q No 2 a) (5)

What are the Mobile App constraints? Illustrate the typical architecture of a mobile app with a suitable diagram.

Unit-3

Q No 3 a) (5)

Discuss as to how parallel processing can enhance the performance of Web based applications.

Unit-4

Q No 4 a) (5)

Discuss the concept of RAID and the factors that should be considered in selecting its levels. Compare level 1 and 5.

Unit-5

Q No 5 a) (5)

Discuss multi-table clustering file organization, as a file storage technique.

For the relations given below:

domain	**venue**	**budget**
R&D	Matthew	900000
Finance	Smith	700000

The *domain* relation

ID	**name**	**dept_name**	**salary**
10101	Bob	R&D	65000
33456	Clay	Finance	85000
41565	Robert	R&D	75000
50021	Michael	R&D	50000

The *employee* relation

Write an SQL query that computes a natural join of the *domain* and the *employee* relations. Show the resultant multitable clustering file structure.

Unit-6

Q No 6 a) (5)

Elaborate on the four significant properties that a database should adhere to while dealing with transactions.

Unit-7

Q No 7 a) (5)

Consider the given transaction:

```
Ti: read(A);
    A: = A-100;
    write(A);
    read(B);
    B: = B + 100;
    write(B);
```

[Given: Before the transactions; account A and account B have Rs.2000 and Rs.3000 respectively]

Suppose that a failure happened after write(A) operation but before write(B) operation, what is the effect on the database? What are the resultant values of accounts A and B? Will the value A+B be preserved? What is this condition known as?

Q No 8 a) (5)

Consider the following concurrent transactions:

T1	**T2**
read(A)	
A: = A – 50	
	read(A)
	temp: = A * 0.1
	A: = A – temp
	write(A)
	read(B)
write(A)	
read(B)	
B: = B + 50	
write(B)	
commit	
	B: = B + temp
	write(B)
	commit

[Given: Prior to the transactions; account A and account B have $1000 and $500 respectively]

a) After the above given transactions, what is the total amount of money in account A, account B and is the sum A + B preserved? Is it a consistent state?

b) If not, write the transactions with the modifications to achieve consistency.

Q No 9 a) (5)

Let X and Y be two accounts that are accessed by transactions T1 and T2.

a) Make a serial schedule and write transaction T1, that transfers $50 from account Y to account X.

b) Make a serial schedule and write a transaction T2, that displays the total amount in the accounts X and Y (i.e X+Y).

NOTE: Make use of locks for these transactions to ensure Isolation.

[Given: Prior to the transactions; account X and account Y have $2000 and $1000 respectively]

Unit-10

Q No 10 a) (5)

Referring to the Block movements strategy between the disk and the main memory, draw the schematic and explain the movement of data between the disk, the buffer and the transaction work area.