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Roll No. ....

Total Pages : 3

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**B.Sc. (Hons.) Physics, II Semester**  
**INTRODUCTION TO DATABASE SYSTEM**  
**(OCSC-201)**

Time : 3 Hours]

[Max. Marks : 75

**Instructions :**

- (i) *It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.*
- (ii) *Answer any four questions from Part-B in detail.*
- (iii) *Different sub-parts of a question are to be attempted adjacent to each other.*

**PART-A**

1. (a) What is difference between instance and schema? (1.5)
- (b) Define primary key and foreign key. (1.5)
- (c) List any two responsibilities of DBA. (1.5)
- (d) Why do we need normalization? (1.5)
- (e) Describe lossless join decomposition. (1.5)
- (f) What do you mean by a weak entity? (1.5)
- (g) List out Data base applications. (1.5)
- (h) What is functional dependency? (1.5)
- (i) Explain the difference among Entity, Entity Type & Entity Set (1.5)
- (j) What is a view? (1.5)

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[P.T.O.]

## PART-B

2. (a) What are the different types of database end users? Discuss the main activities of each. (8)

(b) What is Data modelling? Explain relational model. (7)

3. (a) What is data independence? Discuss three level architecture of data independence. (8)

(b) Explain Set operators in Relational algebra. (7)

4. (a) Consider the given database Schema (8)

Employee (E NAME, ENO, DOB, Address, Sex, Salary, Supereno, Dno)

Department (Dname, Dnumber, mgreno, mgrstartdate)

Dept\_locations (Dnumber, Dlocation)

Project (Pname, Pnumber, plocation, dnum)

Works\_on (EENO, PNo, hours)

Dependent (EENO, Dependent\_Name, Sex, BDate, Relationship)

Write the queries in relational algebra with the above schema

(i) Retrieve the name and address of all employees who work for the 'Research department'.

(ii) For each department, retrieve the department name and the average salary of all employees working in that department.

(iii) List the total number of employees in various departments.

(iv) Retrieve the names of employees who work on all the projects that 'Maheshkumar' works on.

(b) By considering an example describe various data update operations in SQL. (7)

5. (a) What is a join? Discuss different types of joins. (8)
- (b) State 1NF, 2NF & 3NF and explain with examples. (7)
6. (a) Construct an ER diagram for university registrar's office. The office maintains data about each class, including the instructor, the enrollment and the time and place of the class meetings. For each student class pair, a grade is recorded. Determine the entities and relationships. (8)
- (b) Explain insertion, deletion and modification anomalies with suitable examples. (7)
7. (a) Differentiate between the following: (15)
- (i) Database approach and traditional file system.
  - (ii) Two tier and three tier client server architectures.
  - (iii) Entity integrity constraint and referential integrity constraint.
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