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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY  
07 THRISSUR CLUSTER

**FIRST SEMESTER M.TECH. DEGREE EXAMINATION DECEMBER 2017**

**COMPUTER SCIENCE AND ENGINEERING**

**(Common to MTech CSE and Cyber Security)**

**07CS6105 TOPICS IN DATABASE SYSTEMS AND DESIGN**

**Time : 3 hours**

**Max.Marks: 60**

Answer all six questions. Part 'a' of each question is compulsory.

Answer either part 'b' or part 'c' of each question

Q.no.	Module 1	Marks
1a	Compare and contrast Key, Super key, candidate key and primary key with suitable example.	4

**Answer b or c**

- |   |  |   |
|---|--|---|
| b | When is the concept of weak entity used in data modelling? Define the terms owner entity type, weak entity type, identifying relationship type, and partial key. | 5 |
| c | Outline the steps to convert the basic ER model to relational database schema.   | 5 |

Q.no.	Module 2	Marks
2a	What is multivalued dependency? Define fourth normal form.	4

**Answer b or c**

- |   |  |   |
|---|--|---|
| b | Consider the relation $R = \{A, B, C, D, E, F, G, H, I, J\}$ and the set of functional dependencies $F = \{AB \rightarrow C, BD \rightarrow EF, AD \rightarrow GH, A \rightarrow I, H \rightarrow J\}$ . What is the key for R? Decompose R into 2NF and then 3NF relations. | 5 |
| c | Write an algorithm for non-additive join decomposition into BCNF schemas.  | 5 |

Q.no.	Module 3	Marks
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**3a** What are triggers in SQL? Explain with an example. **4**

**Answer b or c**

**b** CUSTOMER(CUSTID,CNAME,ADDRESS,PHONE) **5**

ORDERS (ORDERNO,ORDER\_DATE,CUSTID)

CUSTID is the foreign key referring to CUSTOMER table. Primary keys are underlined.

Write SQL queries for:-

- i) Create the tables CUSTOMER and ORDERS.
- ii) Retrieve names of customers who place more than two orders along with the number of orders they placed.
- iii) List the orders and dates in the descending order of order date.

**c** How multiple tuples are retrieved in Embedded SQL? Illustrate with suitable example. **5**

<b>Q.no.</b>	<b>Module 4</b>	<b>Marks</b>
<b>4a</b>	Illustrate the inheritance hierarchy of the built-in construct of the object model.	<b>4</b>

**Answer b or c**

**b** Declare the types EMPLOYEE (name ,eid , department ,salary, address, Birth\_date, supervisor) and DEPARTMENT(dname ,dnumber , manager\_id , mgr\_startdate) in ODL. **5**

**c** Describe the OQL concepts with examples: database entry points, iterator variables, path expressions, aggregate functions. **5**

<b>Q.no.</b>	<b>Module 5</b>	<b>Marks</b>
<b>5a</b>	Discuss about data modelling for Data Warehouses.	<b>5</b>

**Answer b or c**

**b** Describe the architecture of a data warehouse. **7**

**c** Explain the types of knowledge discovered during Data Mining. **7**

<b>Q.no.</b>	<b>Module 6</b>	<b>Marks</b>
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**6a** Explain the structure of a PL/SQL block with an example. **5**

**Answer b or c**

**b** Describe Oracle's logical database structure. **7**

**c** Develop a PL/SQL program to display the total number of Employees in the EMPLOYEE table. The EMPLOYEE table has the attributes Eid , Name , Department and Salary. **7**