INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)
Dundigal, Hyderabad - 500 043

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MODEL QUESTION PAPER-I

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B.Tech V Semester End Examinations, November - 2019
Regulations: R16
ADVANCED DATABASES
(Information Technology)

Time: 3 hours   **Max. Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

UNIT – I

1. a) Discuss about the starburst rule definition. Write the query for the following statement **[7M]**
       "salary of employees is not larger than the salary of the manager of their department".
    b) Discuss in detail about various applications related to active database systems. **[7M]**

2. a) Define active database? Explain the difference between relational prototype system and **[7M]**
       two- relational systems.
    b) Explain in detail the IDEA methodologies with its purpose, ingredients and phases. **[7M]**
       Discuss the design tools supporting the methodology.

UNIT – II

3. a) Explain the temporal query languages and discuss any three temporal algebraic **[7M]**
       operators with example
    b) Create a table using the attributes (name, address, city, and region) of employees living **[7M]**
       in INDIA. Write a query to find the list of persons living in INDIA.

4. a) Discuss the time density and explain about TSQL2 data model with example. **[7M]**
    b) Write the syntax for "Who has been on a drug for more than a total of six months"? **[7M]**
       Using following Scenario:
       I.   Patient records include information on the drugs prescribed to each patient.
       II. The valid time specifies the period(s) during which the drug was prescribed.
       III. The valid time has a granularity of day (transaction time granularity is system
            defined)

UNIT – III

5. a) Explain the algorithm for mapping a safe, non-recursive datalog program P into RA. **[7M]**
    b) Based on datalog, the following schema is given : **[7M]**
       Purchase(pid, product, price, quantity)
       Product(pname, manufacturer)
       I.   Find all products under 9.99
       II. Find all manufacturers that manufacture some products under 9.99
       III. Find manufacturers that manufacture products both < 9.99 and > 999.99

6. a) For the following database schema: **[7M]**
       part-cost (BasicPart, Supplier, Cost, Time)
       assembly(Part, Subpart, Qty)
       Write the rule:
       I.   For each part, basic or otherwise, find its basic subparts.
       II. For each basic part, find the least time needed for delivery
       III. Times required for basic subparts of the given assembly.
    b) Explain the Relational Calculi and its flavors in detail. **[7M]**

UNIT – IV

7. a) Define Multimedia? List out traditional indexing methods? Explain about spatial access method in detail. **[7M]**
    b) Consider the following table: **[7M]**
       Country (name: String, pop: number, boundary: POLYGON) Where for each country, we record its name, population, and boundary. Also assume that country name is a primary key. Write an SQL-like quarry language for "List the name, population and area of each country in the country table".

8. a) Discuss about multimedia system and its applications. Give the meaning for secondary keys and text retrieval with examples. **[7M]**
    b) Discuss about sub pattern matching and sketch of the approach - ST-Index with suitable example. **[7M]**

UNIT – V

9. a) Explain about models of uncertainty database. Briefly described about uncertainty database in image database. **[7M]**
    b) List out the probabilistic relational databases and explain the converting the probabilistic tuples to annotated tuples. **[7M]**

10. a) Explain lattice based relational databases and give example for querying lattice based databases. **[7M]**
    b) Discuss in detail the properties, languages and operators of probabilistic knowledge bases. **[7M]**

COURSE OBJECTIVES:
The course should enable the students to:

I	Define entity relationship model and transaction processing system.
II	Understand various storage structures for database
III	Describe the distributed and parallel database processing
IV	Describe object oriented database concepts and models.
V	Understand various advancements in database technology

COURSE OUTCOMES (COs):

CO 1	Understand the concept of Active Databases in Starburst, Oracle, and DB2.
CO 2	Analyze the concepts of Temporal and Object Databases-SQL.
CO 3	Understand the Concepts of Relational calculi, relational algebra and recursion.
CO 4	Explore the concept of Spatial, Text and Multimedia Databases.
CO 5	Understand the concept of Uncertainty in Databases.

COURSE LEARNING OUTCOMES (CLOs):

AIT505.01	Understand and explain the key ideas underlying database systems and the database approach to information storage and manipulation.
AIT505.02	Design and implement database applications.
AIT505.03	Understand the types of tasks involved in database administration and the facilities provided in a typical database system to support these tasks
AIT505.04	Be able to design adequate backup, recovery and security measures for a database installation, and understand the facilities provided by typical database systems to support these tasks.
AIT505.05	Define and use important temporal concepts, such as time point, time interval, and time-interval operators such as before, after and overlaps.
AIT505.06	Understand the temporal data model at the conceptual level.
AIT505.07	Describe some of the extensions to conventional query languages that have been proposed to support temporal query processing.
AIT505.08	Critically assess the strengths and weaknesses of Object databases with respect to Relational systems.
AIT505.09	Describe why Object databases appear to be such a good fit for a number of major growth areas in computing, such as Web-based and multimedia information systems.
AIT505.10	Describe the strategy being adopted by major database supplier Oracle to address the apparent threat of Object database systems, and critically compare this approach with a pure Object technology approach
AIT505.11	Formulate, using relational calculus solutions to a broad range of query problems

AIT505.12	To identify a range of concepts, techniques and tools for creating and editing the interactive multimedia database
AIT505.13	To identify the current and future issues related to multimedia technology to store information
AIT505.14	To impart an overview of emerging data models like temporal, mobile and spatial databases
AIT505.15	Be familiar with a commercial relational database system (Oracle) by writing SQL using the system.

MAPPING OF SEMESTER END EXAMINATION - COURSE OUTCOMES

SEE Question No			Course Learning Outcomes	Course Outcomes	Bloom's Taxonomy Level
1	a	AIT505.01	Understand and explain the key ideas underlying database systems and the database approach to information storage and manipulation.	CO 1	Understand
	b	AIT505.02	Understand and explain the key ideas underlying database systems and the database approach to information storage and manipulation.	CO 1	Remember
2	a	AIT505.02	Understand the types of tasks involved in database administration and the facilities provided in a typical database system to support these tasks	CO 1	Understand
	b	AIT505.04	Understand and explain the key ideas underlying database systems and the database approach to information storage and manipulation.	CO 1	Remember
3	a	AIT505.05	Be able to design adequate backup, recovery and security measures for a database installation, and understand the facilities provided by typical database systems to support these tasks.	CO 2	Remember
	b	AIT505.06	Understand the temporal data model at the conceptual level.	CO 2	Understand
4	a	AIT505.05	Define and use important temporal concepts, such as time point, time interval, and time-interval operators such as before, after and overlaps.	CO 2	Understand
	b	AIT505.06	Define and use important temporal concepts, such as time point, time interval, and time-interval operators such as before, after and overlaps	CO 2	Understand
5	a	AIT505.07	Describe some of the extensions to conventional query languages that have been proposed to support temporal query processing.	CO 3	Remember
	b	AIT505.09	Describe some of the extensions to conventional query languages that have been proposed to support temporal query processing.	CO 3	Understand
6	a	AIT505.07	Describe why Object databases appear to be such a good fit for a number of major growth areas in computing, such as Web-based and multimedia information systems.	CO 3	Remember
	b	AIT505.09	Critically assess the strengths and weaknesses of Object databases with respect to Relational systems.	CO 3	Understand
7	a	AIT505.15	Formulate, using relational calculus solutions to a broad range of query problems	CO 4	Remember
	b	AIT505.13	Describe the strategy being adopted by major database supplier Oracle to address the apparent threat of Object database systems, and critically compare this approach with a pure Object technology approach	CO 4	Understand
8	a	AIT505.12	To identify the current and future issues related to multimedia technology to store information	CO 4	Remember
	b	AIT505.13	To identify a range of concepts, techniques and tools for creating and editing the interactive multimedia database	CO 4	Understand

9	a	AIT505.16	Be familiar with a commercial relational database system (Oracle) by writing SQL using the system.	CO 5	Remember
	b	AIT505.17	Be familiar with a commercial relational database system (Oracle) by writing SQL using the system.	CO 5	Remember
10	a	AIT505.16	To impart an overview of emerging data models like temporal, mobile and spatial databases	CO 5	Remember
	b	AIT505.17	Be familiar with a commercial relational database system (Oracle) by writing SQL using the system.	CO 5	Remember

Signature of Course Coordinator   **HOD, IT**