

Advanced Database
(REVISED COURSE)

23-5-09

3 p.m. to 6 p.m.

[Total Marks : 100]

(3 Hours)

N.B.: (1) Question No. 1 is compulsory.(2) Answer any **four** out of the **remaining** questions.

1. You need to design a database for an Art Gallery. The database schema must keep information about artists, their names (which are unique), birthplaces, age, and style of art and a photograph. For each piece of artwork, the artist, the year it was made, its unique title, its type of art (e.g., painting, sculpture, photograph), and its price, along with the picture (Thumbnail) must be stored. The database also stores information about Customers.
For each customer, the database stores that person's unique name, address, and total amount of money spent in the gallery and the artists and type of art that the customer tends to like (can be a text).
 - (a) Draw an extended E- R diagram for the system. 6
 - (b) Design an Object Oriented Schema 8
 - (c) Take two typical queries and write them in OQL. 6

2. University of Mumbai wants to put up its database of exam results for the past 20 years onto the web.
 - (a) Discuss the design for such a web database. 10
 - (b) Describe XML schemas for the database. 10

3. (a) Consider the global schema :—
PATIENT(*Number, Name, SSN, Amount_Due, Dept, Doctor, Med_treatment*)
DEPARTMENT (*Dept, Location, Director*)
STAFF (*Staffnum, Director, Task*)
 - (i) Show 2 examples of horizontal fragmentation 5
 - (ii) Show 2 examples of vertical fragmentation 5
 - (iii) Show 2 examples of derived fragmentation. 5
- (b) Describe an algorithm to perform joins in a parallel database. 5

4. (a) Describe with example applications the need for relational object and object relational databases. 10
- (b) Compare and contrast the object and the relational data models. 10

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5. Consider the following database for a chain of bookstores.

BOOKS (Booknum, Primary _author, Topic, Total_stock, price)

BOOKSTORE (Storenum, City, State, Zip, Inventory_value)

STOCK (Storenum, Booknum, Qty)

- (a) Indicate a star schema that could be used for building a data warehouse. 10
- (b) Using examples describe how data mining can be useful in the above application. 10

6. Explain the following concepts with examples :—

- (a) Object Identity (O/D) 5
- (b) Type constructor 5
- (c) Persistent data types 5
- (d) Accessor functions (GET and SET). 5

7. Write detailed notes on :—

- (a) Geographical Information Systems (GIS) 10
- (b) Mobile Databases. 10