No. of Printed Pages : 4

MCS-043

MCA (Revised)

Term-End Examination

00691

June, 2017

MCS-043 : ADVANCED DATABASE MANAGEMENT SYSTEMS

Time : 3 hours *Maximum Marks : 100*

Note : *Question number 1 is* ***compulsory****. Answer any* ***three*** *questions from the rest.*

1. (a) Consider the following relations :

Customer (c_id, cust_name, cust_phone)

Purchase (c_id, item_code, quantity)

Consider the query "List the c_id, cust_name, cust_phone, item_code and quantity of all the items pruchased by the customer whose c_id = "C001"."

Perform the following tasks for the above :

(i) Write the above query using relational algebra and draw the query tree for the same. 3

(ii) Transform the query tree to an equivalent query tree such that the query evaluation cost may be reduced. 2

(b) What is join dependency ? When is join dependency considered as trivial ? Explain with suitable example. 5

(c) How does embedded SQL differ from dynamic SQL ? Give an example for each. 5

(d) Discuss the term "ETL". List the transformations required to perform the ETL process. 5

(e) What is OLAP ? How does OLAP support query processing in a data warehouse ? 5

(f) Differentiate between XML schema and Document type definition. Give suitable examples for each. 5

(g) Construct an EER diagram for the following description :

"A University maintains records of its students and the programmes in which they have enrolled. It stores student id, name, address, and phone number of a student and programme code, programme name and duration of a programme. A student is either a full time student or a part time student (only one of the types). A student can register for many programmes and a programme can have many students." 5

(h) Write the SQL commands for giving permission to a user named "DBM" for creating new tables. Also write the command if the above permission is to be removed. 5

2. (a) What are Multivalued dependencies ? When can we say that multivalued dependency is trivial ? Discuss with a suitable example. 7

(b) List the various UML diagrams. How do UML class diagrams contribute to Database Design ? 5

(c) What is a system catalogue ? Discuss the role of system catalogues in Database Administration. 8

3. (a) What is semi-structured data ? Explain with an example. How does a valid XML document differ from a well-formed XML document ? 7

(b) What is Data Warehousing ? Discuss the various characteristics of Data Warehousing. 5

(c) What is query optimization ? Why is a query expressed in relational algebra preferred over a query expressed in SQL ? What are the factors that contribute to the cost of a query ? 8

4. (a) Differentiate between the following : 7

(i) Spatial Databases and Temporal Databases

(ii) 2-phase commit and 3-phase commit

(b) What is a datagrid ? What is the utility of a datagrid ? Draw a block diagram to describe the structure of a datagrid. 5

(c) How do clustering and classification differ ? Describe Bayesian classification, with suitable example. 8

5. Explain any ***five*** of the following : *5×4=20*

(a) K-mean Clustering

(b) SQLJ and its requirements

(c) Statistical Database Security

(d) Buffer Management

(e) Data Marks

(f) GNOME Databases

(g) JDBC