No. of Printed Pages : 5

MCS-023

MCA (Revised) / BCA (Revised)

Term-End Examination

06985 **December, 2016**

MCS-023 : INTRODUCTION TO DATABASE MANAGEMENT SYSTEMS

Time : 3 hours *Maximum Marks : 100*

(Weightage 75%)

Note : *Question no. **1** is **compulsory**. Attempt any **three** questions from the rest.*

1. (a) Compute the closure of the following set F of functional dependencies for relation schema R = (A, B, C, D, E).

$$A \rightarrow BC$$

$$CD \rightarrow E$$

$$B \rightarrow D$$

$$E \rightarrow A$$

List the candidate keys for R. *8*

(b) Justify the following statements : *8*

(i) Relation must have a key.

(ii) Weak entities do not have their own key attributes.

(c) Compare primary, secondary and clustering indexes. Which of these indexes are dense and which are not ? How is implementation of clustering indexes performed ? *10*

(d) Consider the following relations :

A :

P_{id}	P_{Name}
001	abc
002	cde
011	efg
014	ghi
015	ijk
016	klm

B:

P_{id}	P_{Name}
002	cde
011	efg
015	ijk
016	klm

Find the following : *10*

(i) $A \cup B$

(ii) $A - B$

(iii) $A \cap B$

(iv) $A \times B$

(e) Explain briefly about Data Replication. Give its disadvantages. *4*

2. (a) For the following problem definition :

The book club has members. The book club sells books to its members. The members place orders for books, which the book club fulfils. Each order contains one or more than one book. The books are written by author(s). The publisher publishes the book. An author can write more than one book and a book can have more than one author. A book is published by a publisher, but a publisher publishes many books. A member can place more than one order. The member also can choose not to place an order. The book club sells many books.

Draw an ER Diagram. *10*

(b) Consider the 'F' and 'G' sets of functional dependencies, where

$F = \{A \rightarrow C, AC \rightarrow D, E \rightarrow AD, E \rightarrow H\}$ and $G = \{A \rightarrow CD, E \rightarrow AH\}$.

Check whether they are equivalent or not. *5*

(c) Consider the relation R(A, B, C, D, E), and the set of functional dependencies

$$F = \{A \rightarrow D, \{A, B\} \rightarrow C, D \rightarrow E\}.$$

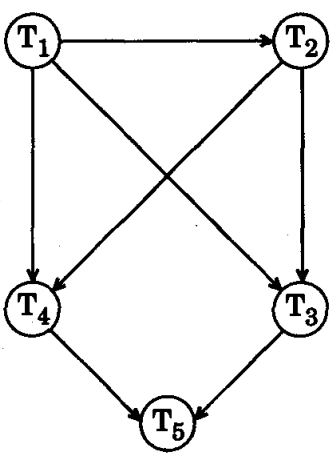
Which of the following is a candidate key ? *5*

(i) {A}

(ii) {A, B}

(iii) {A, E}

3. (a) Consider the precedence graph of a schedule given below. Is the schedule conflict serializable ? Justify. *5*



(b) Discuss the wait-die and wound-wait protocols for deadlock prevention. *7*

(c) Distinguish between deferred update and immediate update log based recovery techniques. *8*

4. (a) Consider the following tables :

WORKS(Pname, Cname, Salary)

LIVES(Pname, Street, City)

LOCATED(Cname, City)

MANAGER(Pname, Mname)

Write a query in SQL for the following : *10*

(i) List the names of the people who work for the company 'Wipro' along with the cities they live in.

(ii) Find the people who work for the company 'Infosys' having salary greater than ₹ 50,000.

(iii) List the names of the people, along with the street and city addresses.

(iv) Find the persons whose salaries are more than that of all of the 'Oracle' employees.

(v) Find the names of the persons who do not work in 'Infosys'.

(b) Discuss the following relational constraints : *10*

(i) Domain

(ii) Entity

(iii) Referential Integrity

(iv) Key Constraint

5. (a) Discuss the anomalies due to insertion, updation and deletion in a relation that is not in QNF. Illustrate with the help of an example. *5*

(b) Write short notes on the following : *3×5=15*

(i) Web Databases

(ii) Distributed Databases

(iii) Shadow Paging