

Total number of printed pages-5

53 (IT 402) DBMS

2019

DBMS

Paper : IT 402

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

Answer **any five** questions.

1. 5×4=20
- (a) Differentiate between database system with conventional file system.
 - (b) What are the entity integrity and referential integrity ruler ?
 - (c) What are the responsibilities of a database administrator ?
 - (d) Differentiate between physical and logical data independence.

Contd.



2. (a) Explain Insertion, Deletion and Modification anomalies with suitable examples. 10
- (b) What do you mean by the closure of functional dependencies? Illustrate with an example. 5
- (c) What is 2-phase locking protocol? How does it guarantee serializability? 5
3. (a) Consider relation R(A, B, C, D, E) with FDs as $A \rightarrow B$, $BC \rightarrow E$ and $ED \rightarrow A$, find out the highest normal form attained by the relation R. Justify your answer. 5
- (b) Why the concurrency control is needed? Explain it. 5
- (c) What is transaction? Mention the desirable properties of transaction. 5
- (d) State BCNF. How does it differ from 3NF? 5
4. (a) Consider the following relational schema:
 ACTOR (Actor_Id, Name, Nationality, Age).
 DIRECTOR (Director_Id, Name, Nationality)

FILM (Film_Id, Title, Year, DirectorId)
 PERFORMANCE (ActorId, FilmId,
 Character)

Represent the given statements in relational algebra form.

- (i) Retrieve all distinct titles of films that were released before 2000.
- (ii) Retrieve all distinct titles of films directed by a British director.
- (iii) Retrieve all information about all combinations of films released in 2012 and directed by a non-American director.
- (iv) Retrieve details of all films released before 2000 or after 2010.
- (v) Retrieve details of all films released between 2000 and 2010. 10
- (b) Consider the following relational schema:
 WORKS (Pname, Cname, Salary)
 LIVES (Pname, Street, City)
 Located_In (Cname, City)
 Manager (Pname, Mgrname)



where Pname: Person name, Cname: Company name and Mgrname: Manager name.

Write the SQL statements for the following:

- (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' with a salary more than 50000/-. List the names of the people along with street and city addresses.
- (iii) Find the names of the people who live and work in the same city.
- (iv) Find the persons whose salaries are more than that of all of the 'Oracle' employees.
- (v) Find the names of the companies that are located in every city where the company 'Infosys' is located.

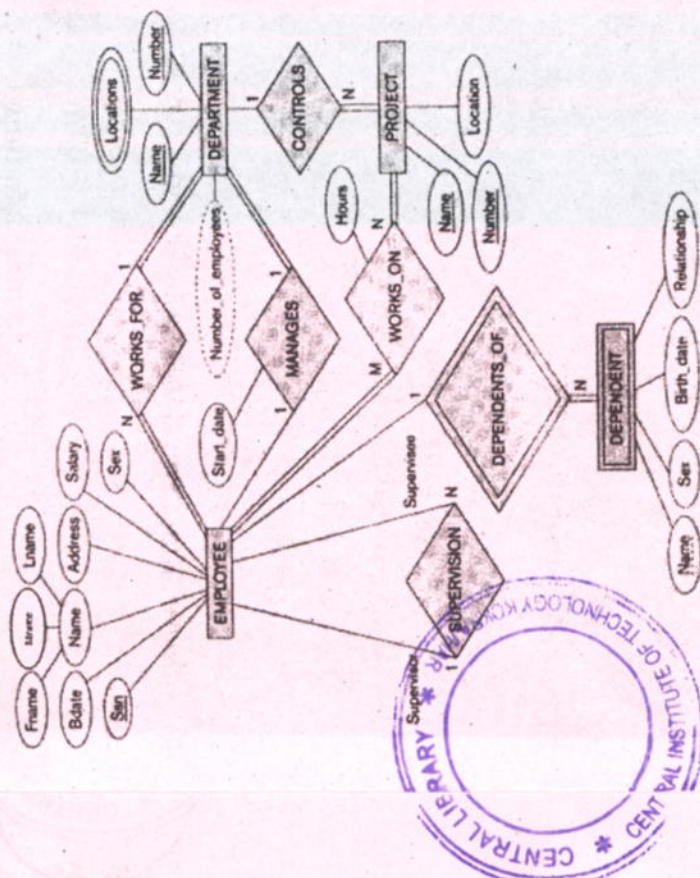
10

5. (a) Write about the different types of attributes in ER model. Show the notation of each.

5

(b) Convert the following ER schema to relational schema.

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6. Write short notes on : (any four) 5×4=20

- (a) Database language
- (b) Database schema
- (c) Keys in DBMS
- (d) Three-tier architecture
- (e) Query optimization.
