

Code: IT4T2

**II B.Tech - II Semester – Regular/Supplementary Examinations –  
April 2017**

**DATABASE SYSTEMS  
(INFORMATION TECHNOLOGY)**

Duration: 3 hours

Max. Marks: 70

**PART – A**

Answer *all* the questions. All questions carry equal marks

11 x 2 = 22

1.

- a) What is the role of foreign key in relational database?
- b) Define instances and schemas of database.
- c) Discuss the use of rename operation.
- d) List Aggregate Functions.
- e) Define Entity and Attribute. Give an example.
- f) Define Assertions.
- g) Define functional dependency. Why are some functional dependencies trivial?
- h) Demonstrate transitive dependency. Give an example.
- i) List the properties of transaction.
- j) Explain about different types of locks.
- k) Define 3<sup>rd</sup> Normal form.

## PART – B

Answer any **THREE** questions. All questions carry equal marks.

3 x 16 = 48 M

2. a) Define data abstraction and discuss levels of abstraction.

8 M

b) Discuss about different types of database schemas using schema diagrams.

8 M

3. Consider the following relational schema

Employee (empno, name, office, age)

Books (isbn, title, authors, publisher)

Loan (empno, isbn, date)

Write the following queries in relational algebra.

a) Find the names of employees who have borrowed a book  
Published by McGraw-Hill. 4 M

b) Find the names of employees who have borrowed all  
books Published by McGraw-Hill. 4 M

c) Find the names of employees who have borrowed more  
than five different books published by McGraw-Hill. 4 M

d) For each publisher, find the names of employees who  
have borrowed? 4 M

4. a) We can convert any weak entity set to strong entity set by simply adding appropriate attributes. Analyze why, then, do we have weak entity sets? 10 M
- b) What is a View? How we use views in SQL queries? 6 M
5. a) Consider a relation scheme  $R=(A, B, C, D, E, H)$  on which the following functional dependencies hold:  $\{A \rightarrow B, BC \rightarrow D, E \rightarrow C, D \rightarrow A\}$ . Write the candidate keys of  $R$ . 9 M
- b) Consider the statement "Every relation in 3 NF is also in BCNF and Vice Versa". Judge whether statement is correct or not? Give explanation. 7 M
6. Analyze which of the following concurrency control protocols ensure both conflict serializability and freedom from deadlock? Explain the following:
- a) 2-phase locking 8 M
- b) Graph Based protocols 8 M