



40901

-2-



PART - B

(5×13=65 Marks)

11. a) Explain the select, project, Cartesian product and join operations in relational algebra with an example. (13)
- (OR)
- b) What is database normalization ? Explain first normal form, second normal form and third normal form with an example. (13)
12. a) Explain the aggregate functions in SQL with an example. (13)
- (OR)
- b) What is query optimization ? Outline the steps in query optimization. (13)
13. a) i) During execution, a transaction passes through several states, until it finally commits or aborts. List all possible sequences of states through which a transaction may pass. Explain why each state transition may occur ? (6)
- ii) Explain with an example the properties that must be satisfied by a transaction. (7)
- (OR)
- b) i) What is concurrency control ? Explain the two phase locking protocol with an example. (7)
- ii) Explain conflict serializability and view serializability. (6)
14. a) What is hashing ? Explain static hashing and dynamic hashing with an example. (13)
- (OR)
- b) Outline the features of the following databases :
- i) Parallel databases. (7)
- ii) Multimedia databases. (6)
15. a) i) Present an overview of database security. (8)
- ii) Explain with diagrammatic illustration the architecture of a distributed database management system. (5)
- (OR)
- b) Explain the necessary characteristics a system must satisfy to be considered as an object oriented database management system. (13)





PART - C

(1×15=15 Marks)

16. a) Consider the following scenario :

A university registrar's office maintains data about the following entities :  
 (a) courses, including number, title, credits, syllabus and prerequisites  
 (b) course offerings, including course number, year, semester, section number, instructor, timings and classroom (c) students, including student-id, name, and program and (d) instructors, including identification number, name, department and title. Further, the enrollment of students in courses and grades awarded to students in each course they are enrolled for must be appropriately modeled.

- i) Model an entity relationship diagram for the above scenario. (6)
- ii) Map the entity relationship diagram you have modeled to relations. (9)

(OR)

b) Apply the Apriori algorithm for discovering frequent item sets to the following data set :

**Trans ID**

**Items Purchased**

- 101
- 102
- 103
- 104
- 105
- 106
- 107
- 108
- 109
- 110

- Mulberry, Raspberry, Cherry
- Mulberry, Papaya
- Papaya, Mango
- Mulberry, Raspberry, Cherry
- Passion Fruit, Cherry
- Passion Fruit
- Passion Fruit, Papaya
- Mulberry, Raspberry, Guava, Cherry
- Guava, Mango
- Mulberry, Raspberry

Use 0.3 for the minimum support value.

(15)