

(2 ½ Hours)

[Total Marks: 75]

- N.B.
- 1) All questions are compulsory.
 - 2) Figures to the right indicate marks.
 - 3) Illustrations, in-depth answers and diagrams will be appreciated.
 - 4) Mixing of sub-questions is not allowed.
 - 5) Assume suitable data if necessary and state it clearly.

Q. 1 Attempt All.

(15M)

(a) Multiple Choice Questions

1. In the _____ normal form, a composite attribute is converted to _____ individual attributes.
A) First B) Second C) Third D) Fourth
2. In an ER model is described in the database by storing its _____ data.
A) Entity
B) Attribute
C) Relationship
D) Notation
3. A is used to define overall design of the database
A. schema
B. application
C. data definition program language
D. code
4. In a LIKE clause, you can ask for any 6 letter value by writing:
A) LIKE _____ (that's six underscore characters)
B) LIKE (that's six dots)
C) LIKE .{6}
D) LIKE ??????
5. Which of the following is part of an administrative policy to secure a database?
A) Authentication policies
B) Limiting particular areas
C) None of the above
D) a and b only

(b) Fill in the blanks.

1. An _____ is a set of entities of the same type that share the same properties, or attributes.
2. Entity is nothing but a _____.
3. Relational Algebra is a _____ query language that takes two relation as input and produces another relation as output of the query.

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4. Functional Dependencies are the types of constraints that are based on _____.
5. _____ defines the access rights provided to a user on a database object.

(c) **Short Answers**

1. State any two examples based on derived attribute.
2. Write syntax of project operation of relational algebra.
3. Define the term DBA.
4. Explain the string function lower() with example.
5. Define the term DBMS.

Q. 2 Attempt the following (Any THREE)**(15M)**

- (a) Draw and explain the architecture of DBMS.
- (b) Show an E-R diagram illustrating the use entity sets listed.

Consider a university database for the scheduling of classrooms for -final exams. This database could be modelled as the single entity set exam, with attributes course-name, section-number, room-number, and time. Alternatively, one or more additional entity sets could be defined, along with relationship sets to replace some of the attributes of the exam entity set, as course with attributes name, department, and c-number, section with attributes s-number and enrollment, and dependent as a weak entity set on course, room with attributes r-number, capacity, and building.

- (c) Write a note on generalization and specialization with suitable example.
- (d) Define the term attribute and Explain the following types of attributes with example.
 - i) Single value
 - ii) Multi valued
 - iii) Composite attribute
- (e) List and explain different database users.
- (f) What are the mapping cardinalities? Give suitable examples to support your answer.

Q. 3 Attempt the following (Any THREE)**(15M)**

- (a) What do you mean by functional dependency? Explain with suitable example.
- (b) Explain the term normalization and 1NF. State advantages of normalization.
- (c) What is the need of cross product, union operations from relational algebra? Give suitable example.
- (d) Explain different types of data types in MYSQL.
- (e) How to perform commit and rollback operation give example to support your answer.
- (f) Consider table students_academics_details with the following columns:- Rollno, Student_name, Class, Division, Faculty, Marks_subject1, Marks_subject2, Marks_subject3.
Fire following queries
 - 1) Find average marks in each subject faculty wise.

- 2) Find the number of students in each division of each class.
- 3) Find sum of all the m1, m2, m3 subject marks.
- 4) Display the class and the number of students where no > 3

Find minimum, maximum and average marks of m1, m2, m3 subject.

Q. 4 Attempt the following (Any THREE) (15)

- (a) Write the role of DBA.
- (b) Discuss following functions :
1) round() (2) month() (3) now() (4) sqrt() (5) year()
- (c) Explain following with respect to view:
 - Definition
 - How to create a view
 - Example
- (d) What do you mean by subquery? How it gets executed? Explain with suitable example.
- (e) Define the term privilege with respect to database and its types.
- (f) Discuss various types of Threats to Databases.

Q. 5 Attempt the following (Any THREE) (15)

- (a) List and explain different types of notations used in ER diagram.
- (b) Write queries in relational algebra form:
 - 1) Find the information of employee name "rahul" from employee table.
 - 2) Select the records from employee table with department_id=20 and sal >50000.
 - 3) Find all employees having age < 45 from employee table.
 - 4) Rename employee table to EMP.
 - 5) Find name from employee whose address is thane.

- (c) Explain following string handling functions:
1) length() (2) upper() (3) replace() (4) concat() (5) lower()

- (d) Consider the following table:

id	name	work_date	daily_typing_pages
1	John	2007-01-24	250
2	Ram	2007-05-27	220
3	Jack	2007-05-06	170
3	Jack	2007-04-06	100
4	Jill	2007-04-06	220
5	Zara	2007-06-06	300

| 5 | Zara | 2007-02-06 | 350 |

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Answer following queries:

- a) Find the count for a name Zara
- b) calculate total of all the dialy_typing_pages
- c) sum up all the records related to a single person
- d) calculate square root of all the dialy_typing_pages
- e) fetch year from database

(e) Explain super key and candidate key with suitable example.
