

No. of Printed Pages : 6

BCS-092

**CERTIFICATE OF MOBILE
APPLICATION DEVELOPMENT
(CMAD)**

Term-End Examination

December, 2021

BCS-092 : INTRODUCTION TO DATABASES

Time : 3 Hours

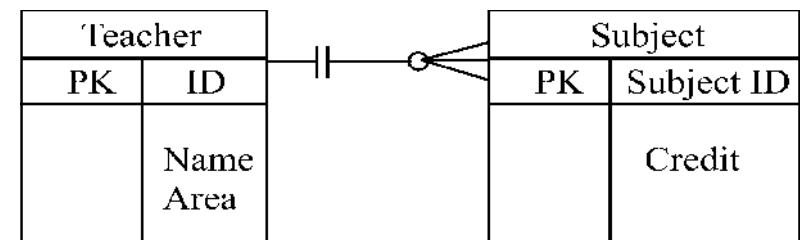
Maximum Marks : 75

Note : There are **five** questions in this paper.
Question No. 1 is compulsory. Attempt any
three questions from the rest (question 2 to
question 5).

1. (a) What are the advantages of using database management system for a Banking System ? Explain. 4
- (b) Define the following terms in the context of database system : 5
 - (i) Domain

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- (ii) Atomic value
 - (iii) Physical data independence
 - (iv) Logical data independence
 - (v) Data model
- (c) Consider the following ER diagram :



- (i) Explain each symbol used in the ERD above. 4
- (ii) What information is being modeled by this ERD ? Explain briefly. 4
- (iii) Convert the ERD into relations (tables). 4
- (d) Given the following relational scheme and functional dependencies;
 STUDENT(Student-id, student-name, course-code, course-name, credit, marks, date-of-examination)

The functional dependencies are :

Student-id \rightarrow Student-name

Course-code \rightarrow Course-name

Course-code \rightarrow Credit

Course-code , Student-id \rightarrow marks

Course-code, Student-id \rightarrow Date-of-

examination

Answer the following questions :

(i) What is the primary key of the relation ? 2

(ii) What are the update insertion and deletion anomalies in the relation ? 3

(iii) Normalise the relation into 3rd Normal form. 4

2. (a) What are the limitations of file based approach ? How database approach can overcome these shortcomings ? 7

(b) Consider the following relations :

Bank(account-no, branch code, accountholder-name)

Branch (branch-code, branch-name, phone)

Write SQL command for the following queries :

(i) Count the number of accounts in each branch. You should display branch-code and number of accounts in that branch. 2

(ii) List the account-no, branch-code, branch-name and phone for all the accounts. 2

(iii) List the branch which has less than 10 accounts. 2

(iv) List the branch details in the order of branch name. 2

3. (a) Write SQL command for creating the following relations with primary key, foreign key and constraints, if any. You must assume a suitable data type of each field. 8

Book(*Book-id*, date-of-purchase, ISBN-number)

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Book-details(*ISBN-number*, first-author,
book-title, publisher, price)

Note ISBN-number is Book table is a
foreign key and price of the book should
not be more than ₹ 1,000.

- (b) Differentiate between the following : 4
- (i) 3NF and BCNF
 - (ii) 1NF and 2NF
- (c) What is the use of Armstrong's axioms ? 3
4. (a) What is meant by the term Data Type in
the context of SQL ? Explain any *four* data
types of SQL. 5
- (b) What is meta data in a database system ?
Explain with the help of an example. 3
- (c) Explain the "conceptual level" of the
database architecture. 3
- (d) Differentiate between the following : 4
- (i) Hierarchical database model and
network database model.
 - (ii) Relational database model and object
oriented database model.

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5. Explain the following with the help of a
diagram/example : 5×3=15

- (a) Schema
- (b) Cartesian product
- (c) Right outer join
- (d) Requirement gathering
- (e) Maintenance of a database system

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