

B.E./B.TECH. Degree Examination, December 2020
Fourth Semester
CS16402-DATABASE MANAGEMENT SYSTEMS
(Regulation 2016)

Time: Three hours

Maximum : 80 Marks

Answer **ALL** questions

PART A - (8 X 2 = 16 marks)

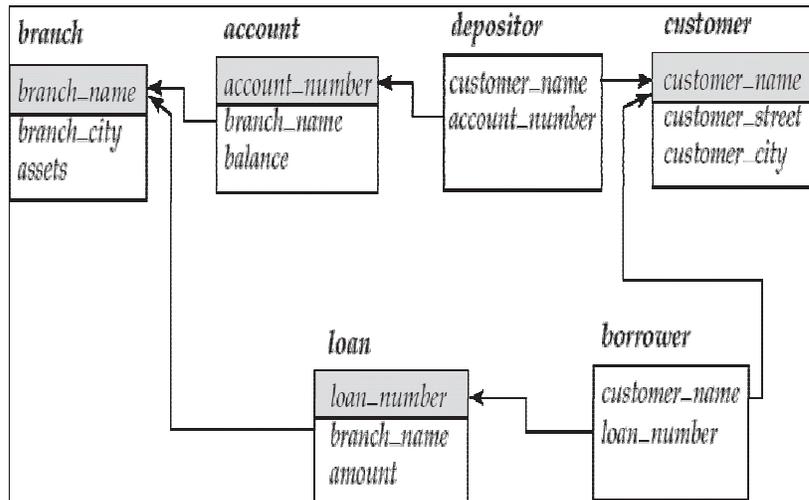
1. Database _____ which is the logical design of the database, and the database _____ which is a snapshot of the data in the database at a given instant in time.
 - a) Instance, Schema
 - b) Relation, Schema
 - c) Relation, Domain
 - d) Schema, Instance
2. Identify the function of second normal form (2NF):
 - a) Eliminate all hidden dependencies
 - b) Eliminate the possibility of a insertion anomalies
 - c) Have a composite key
 - d) Have all non-key fields depend on the whole primary key
3. Which of the following is an autonomous homogenous environment?
 - a) The same DBMS is at each node and each DBMS works independently.
 - b) The same DBMS is at each node and a central DBMS coordinates database access.
 - c) A different DBMS is at each node and each DBMS works independently.
 - d) A different DBMS is at each node and a central DBMS coordinates database access.
4. XPath is a language for finding information in an
 - a) XSL document
 - b) XHTML document
 - c) XQuery document
 - d) XML document
5. Consider the following relation: EMP (ENO, NAME, DATE_OF_BIRTH, SEX, DATE_OF_JOINING, BASIC_PAY, and DEPT). Develop an SQL query that will find and display the average BASIC_PAY in each DEPT
6. Consider the following relation: R (A, B, C, D). The primary key of the relation is A. The following functional dependencies. (i) $A \rightarrow BC$ (ii) $B \rightarrow D$. Is the above relation in third normal form?

7. Illustrate the importance of cascading Rollback with an example.
8. Which are the factors to be considered for the evaluation of indexing and hashing techniques?

PART B - (4 X16 = 64 marks)

09. (a) (i)

(16)



- a. Find all loans of over \$1200.
- b. Find the loan number for each loan of an amount greater than \$1200.
- c. Find the names of all customers who have a loan, an account, or both, from the bank.
- d. Find the names of all customers who have a loan at the Sriperumbudur branch.
- e. Find the names of all customers who have a loan at the Sriperumbudur branch but do not have an account at any branch of the bank.
- f. Find the names of all customers who have a loan at the Sriperumbudur branch.
- g. Find the name of all customers who have a loan at the bank and the loan amount

(OR)

- (b) (i) State the need for normalization of a database and illustrate with suitable (16)

example.

- i. 1st NF
- ii. 2nd NF
- iii. 3rd NF
- iv. 4th NF
- v. 5th NF

10. (a) (i) Identify the problems caused by redundant data? Differentiate conflict serializability and view serializability in detail with an example. (16)

(OR)

- (b) (i) How is the atomicity maintained during concurrent transactions? How is locking implemented? Explain the protocol that is used to maintain the concurrency concept (8)
- (ii) Illustrate the concept of deadlock detection & deadlock recovery with suitable example. (8)

11. (a) (i) When is it preferable to use a dense index rather than a sparse index? Explain your answer. (8)

- (ii) Distinguish between closed and open hashing. Discuss the relative merits of each technique in database applications. (8)

(OR)

- (b) (i) Construct the B+ tree with the help of insertion algorithm to insert the following numbers (the order of tree is 3) and explain how the queries are processed in B+ tree. 26,27,28,3,4,7,9,46,48,51,2,6. (16)

12. (a) (i) Discuss the need for building distributed database? Explain important issues in building distributed database with an example. Explain how distributed database is used in client/server environment. (16)

(OR)

- (b) (i) Give the DTD or XML Schema for an XML representation of the following nested-relational schema: (16)

*Emp = (ename, ChildrenSet setof(Children),
SkillsSet setof(Skills))*
Children = (name, Birthday)

Birthday = (day, month, year)

Skills = (type, ExamsSet setof(Exams))

Exams = (year, city)