Total No. of Questions: 6 *Total No. of Printed Pages:3*

Enrollment No.....

Faculty of Science

End Sem (Even) Examination May-2019

BC3CO13 Database Management Systems

Programme: B.Sc. (CS) Branch/Specialisation: Computer Science

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d.

Q.1 i. Which of these individuals play an important role in defining and maintaining a database for an organisation? **1**

(a) Application programmer (b) System analyst
(c) Database administrator (d) Naive user

ii. Which of the following is an advantage of DBMS approach? **1**

(a) Data independency (b) Data dependency
(c) Both (a) and (b) (d) None of these

iii. The strong entity and weak entity type participate in **1**

(a) One-to-one relationship (b) One-to-many relationship
(c) Many to-one relationship (d) Many-to-one relationship

iv. When common attributes of entity types are combined to form higher-level entity type, it is called **1**

(a) Inheritance (b) Specialization
(c) Aggregation (d) Generalization

v. Candidate key can be a **1**

(a) Superkey (b) Irreducible superkey
(c) Foreign key (d) Primary key

vi. Which of the following is the valid SQL statement? **1**

(a) SLELECT * FROM employee WHERE email_id IS NULL;
(b) SLELECT * FROM employee WHERE IS NULL (email_id);
(c) SLELECT * FROM employee WHERE email_id NULL;
(d) All of these

vii. Functional Dependency is a relationship between/among **1**

(a) Tuples (b) Relations (c) Attributes (d) None of these

P.T.O.

viii. In which of the following situation, 3NF and BCNF are considered identical? **1**
(a) If there are more than one candidate key in the relation and they overlap.
(b) If there is only one determinant upon which other attributes depend and it is a candidate key.
(c) If the candidate keys in the relation are composite keys.
(d) None of these

ix. Once the transaction executes its final operation, it enters into____ state **1**
(a) Committed (b) Terminated
(c) Partially committed (d) Failed

x. Strict two-phase locking does not ensure **1**
(a) Cascade lessness (b) Freedom from deadlock
(c) Serializability (d) None of these

Q.2 Attempt any two:

i. Write short note on data definition language and data manipulation language. **5**

ii. What is data independence and why is it important? What is the difference between logical and physical data independence? **5**

iii. Who is database administrator? What are the various responsibilities of a database administrator? **5**

Q.3 Attempt any two:

i. Explain the difference between **5**
(a) Strong and weak entity type.
(b) Specialization and generalization

ii. Consider a BANK database having customer, loan, account, employee and branch entity types. Each branch of bank allows customers to open accounts and borrow loans. A customer can open more than one account, and one account may also belong to one or more customers. Similarly, a customer can take out more than one loan and a loan may be held by more than one customer. The bank has a number of employees working in different branches of the bank. Add appropriate attributes for each entity type. Represent the **5**

key attribute, weak entity type (if any) and cardinality ratio. Make appropriate assumption to complete the specification. Design an E-R diagram for the BANK database.

iii. Explain the various types of constraints on relationship types of the E-R model. **5**

Q.4 Attempt any two:

i. Explain various types of keys used in database. **5**

ii. Discuss the different operators in SQL, which are used with sub queries/ nested queries. **5**

iii. Explain the following commands with examples: **5**
(a) CREATE TABLE (b) ALTER TABLE
(c) DROP TABLE (d) SELECT
(e) INSERT

Q.5 Attempt any two:

i. Explain various update anomalies that can arise in a relational database with examples. **5**

ii. Define with example: **5**
(a) Closure set of functional dependencies
(b) Closure set of attribute dependencies

iii. What is normalization? Explain third normal form with example. **5**

Q.6 Attempt any two:

i. Discuss the two different form of schedule equivalence. **5**

ii. Explain the basic idea of concurrency control using suitable example. **5**

iii. Write short notes on the following **5**
(a) Deadlock (b) Recovery

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Marking Scheme
BC3CO13 Database Management Systems

Q.1
i. Which of these individuals play an important role in defining and maintaining a database for an organisation? **1**
(c) Database administrator

ii. Which of the following is an advantage of DBMS approach? **1**
(a) Data independency

iii. The strong entity and weak entity type participate in **1**
(b) One-to-many relationship

iv. When common attributes of entity types are combined to form higher-level entity type, it is called **1**
(d) Generalization

v. Candidate key can be a **1**
(d) Primary key

vi. Which of the following is the valid SQL statement? **1**
(a) SLELECT * FROM employee WHERE email_id IS NULL;

vii. Functional Dependency is a relationship between/among **1**
(c) Attributes

viii. In which of the following situation, 3NF and BCNF are considered identical? **1**
(b) If there is only one determinant upon which other attributes depend and it is a candidate key.

ix. Once the transaction executes its final operation, it enters into____ state **1**
(c) Partially committed

x. Strict two-phase locking does not ensure **1**
(b) Freedom from deadlock

Q.2 Attempt any two:

i. Data definition language 2.5 marks **5**
Data manipulation language. 2.5 marks

ii. Data independence and its importance 2.5 marks **5**
Difference between logical and physical data independence 2.5 marks

iii. Definition of database administrator 1 mark **5**
Responsibilities of a database administrator
1 mark for each responsibility (1 mark * 4) 4 marks

Q.3 Attempt any two:

i. (a) Strong and weak entity type. 2.5 marks **5**
(b) Specialization and generalization 2.5 marks

ii. Key attribute, weak entity type (if any) and cardinality ratio **5**
1 mark
Appropriate assumption to complete the specification
1 mark
E-R diagram for the BANK database. 3 marks
0.5 mark for each component (0.5 mark *6)

iii. Two types of constraints on relationship types of the E-R model. **5**
2.5 marks for each (2.5 marks *2)

Q.4 Attempt any two:

i. Five types of keys used in database. **5**
1 mark for each (1 mark * 5)

ii. Five operators in SQL 1 mark for each (1 mark * 5) **5**

iii. Commands with examples: 1 mark for each (1 mark * 5) **5**
(a) CREATE TABLE (b) ALTER TABLE
(c) DROP TABLE (d) SELECT
(e) INSERT

Q.5 Attempt any two:

i. Update anomalies that can arise in a relational database with examples. 1 mark for each point (1 mark * 5) **5**

ii. Define with example: **5**
(a) Closure set of functional dependencies 2.5 marks
(b) Closure set of attribute dependencies 2.5 marks

iii. Normalization 1 mark **5**
Third normal form with example
For 3NF 2 marks
For Example 1 mark
For other definitions 1 mark

Q.6 Attempt any two:

i. Two different form of schedule equivalence. **5**

ii. Basic idea of concurrency control using example. **5**

iii. (a) Deadlock 2.5 marks **5**
(b) Recovery 2.5 marks

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