Enrollment No......................................

Faculty of Science

End Sem (Odd) Examination Dec-2018

CA3CO09 Database Management Systems

Programme: BCA   Branch/Specialisation: Computer Application

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. The language that requires a user to specify the data to be retrieved without specifying exactly how to get it is   **1**
(a) Procedural DML.   (b) Non-Procedural DML.
(c) Procedural DDL.   (d) Non-Procedural DDL.

ii. Tree structures are used to store data in   **1**
(a) Network model.   (b) Relational model.
(c) Hierarchical model.   (d) File based system.

iii. It is an abstraction through which relationships are treated as higher level entities   **1**
(a) Generalization.   (b) Specialization.
(c) Aggregation.   (d) Inheritance.

iv. In an E-R diagram double lines indicate   **1**
(a) Total participation.   (b) Multiple participation.
(c) Cardinality N.   (d) None of these

v. Count function in SQL returns the number of   **1**
(a) Values.   (b) Distinct values.
(c) Groups.   (d) Columns.

vi. In SQL, testing whether a subquery is empty is done using   **1**
(a) DISTINCT   (b) UNIQUE
(c) NULL   (d) EXISTS

vii. A relation is in _____ if an attribute of a composite key is dependent on an attribute of other composite key.   **1**
(a) 2NF   (b) 3NF   (c) BCNF   (d) 1NF

viii. In 2NF   **1**
(a) No functional dependencies (FDs) exist.
(b) No multi valued dependencies (MVDs) exist.
(c) No partial FDs exist.
(d) No partial MVDs exist.

ix. Which of the following is not a consequence of concurrent operations?   **1**
(a) Lost update problem   (b) Update anomaly
(c) Unrepeatable read   (d) Dirty read

x. The default level of consistency in SQL is   **1**
(a) Repeatable read   (b) Read committed
(c) Read uncommitted   (d) Serializable

Q.2 i. Differentiate the term data, information and knowledge.   **2**
ii. Explain five duties of Database Administrator.   **3**
iii. What is a database? Describe the advantages and disadvantages of using of DBMS.   **5**
OR iv. What is data independence? Explain the difference between physical and logical data independence.   **5**

Q.3 i. Differentiate between week entity and strong entity set.   **2**
ii. Construct an ER diagram for a hospital with a set of patients and a set of medical doctors. Associate with each patient a log of the various tests and examinations conducted.   **8**
OR iii. Describes the various relationship constraints by giving suitable example.   **8**

Q.4 i. Explain the terms primary key, candidate key and super key.   **3**
ii. Consider the relations   **7**
EMP(ENO,ENAME,AGE,BASIC)
WORK_ON(ENO,DNO)
DEPT(DNO,DNAME,CITY)
Express the following queries in SQL
(a) Find names of employees whose basic pay is greater than average basic pay.

(b) Find the sum of the basic pay of all the employees, the maximum basic pay, the minimum basic pay and the average basic pay.
OR iii. The outer join operations extend the natural join operations so that tuples from the participating relations are not lost in the result of join. Describe how that join operation can be extended so that types from left, right or both relations are not lost from the result of theta join.   **7**

Q.5 i. What is Normalization? Explain second normal form with the help of an example.   **4**
ii. Find out all candidate key of relation R.   **6**
R(ABCDEFGH)
$A \rightarrow BC$
$B \rightarrow CFH$
$CH \rightarrow G$
$E \rightarrow A$
$A \rightarrow EG$
OR iii. Explain Boyce-Codd Normal Form with example and also Compare BCNF and 3NF.   **6**

Q.6 Attempt any two:
i. What are the various states through which a transaction passes through in its lifetime? Briefly discuss all the events that cause transition from one state to another.   **5**
ii. Consider the schedule of three transactions T1, T2 and T3.   **5**
R1(X),R2(Y),R3(Y),W2(Y),W1(X),W3(X),R2(X),W2(X)
Where R stands for READ, W for WRITE and determines if the schedule is serializable. If so, give the schedule.
iii. Compare shadow paging with log based recovery methods.   **5**

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Marking Scheme

CA3CO09 Database Management Systems

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Q.1   i.   The language that requires a user to specify the data to be retrieved without specifying exactly how to get it is   **1**
(b) Non-Procedural DML.

ii.   Tree structures are used to store data in   **1**
(c) Hierarchical model.

iii.   It is an abstraction through which relationships are treated as higher level entities   **1**
(c) Aggregation.

iv.   In an E-R diagram double lines indicate   **1**
(a) Total participation.

v.   Count function in SQL returns the number of   **1**
(a) Values.

vi.   In SQL, testing whether a subquery is empty is done using   **1**
(d) EXISTS

vii.   A relation is in _____ if an attribute of a composite key is dependent on an attribute of other composite key.   **1**
(b) 3NF

viii.   In 2NF   **1**
(c) No partial FDs exist.

ix.   Which of the following is not a consequence of concurrent operations?   **1**
(b) Update anomaly

x.   The default level of consistency in SQL is   **1**
(d) Serializable

Q.2   i.   Difference data, information and knowledge.   **2**

ii.   Five duties of Database Administrator   **3**
0.6 marks each   (0.6 mark * 5)

iii.   Definition of Database   1 mark   **5**
Advantages DBMS   2 marks
Disadvantages DBMS.   2 marks

OR   iv.   Definition of data independence   2 marks   **5**
Difference b/w physical and logical   3 marks

Q.3   i.   Difference b/w week entity and strong entity set   **2**

ii.   Entity identification   2 marks   **8**
Attribute identification   2 marks
Relationship identification   2 marks
Relationship constraints identification   2 marks

OR   iii.   Coordinality   4 marks   **8**
Participation   4 marks

Q.4   i.   Primary key   1 mark   **3**
Candidate key   1 mark
Super key.   1 mark

ii.   Express the following queries in SQL   **7**
(a) Find names of employees whose basic pay is greater than average basic pay.   3 marks
(b) Find the sum of the basic pay of all the employees, the maximum basic pay, the minimum basic pay and the average basic pay   4 marks

OR   iii.   Describe how that join operation can be extended so that types from left, right or both relations are not lost from the result of theta join.   **7**

Q.5   i.   Normalization   1 mark   **4**
Second normal form with example.   3 marks

ii.   Super key identification   2 marks   **6**
Candidate key identification (DA & DE)   4 marks

OR   iii.   Definition of Boyce-Codd Normal Form   2 marks   **6**
Example of BCNF   2 marks
Comparison BCNF and 3NF.   2 marks

Q.6   Attempt any two:

i.   States through which a transaction passes through in its lifetime   **5**
  3 marks
All the events that cause transition from one state to another   2 marks

ii.   Schedule of three transactions T1, T2 and T3.   **5**

iii.   Compare shadow paging with log based recovery methods   **5**
Three differences

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