Reg. No. \_\_\_\_\_\_\_\_\_\_\_\_\_

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**End Semester Examination – Nov / Dec – 2019**

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| **Code :** | **17CS2008** | **Duration :** | **3hrs** |
| **Sub. Name :** | **DATABASE SYSTEMS** | **Max. Marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q.**  **No.** | **Sub**  **Div.** | **Questions** | | **Course**  **Outcome** | **Marks** |
| 1. | a. | Explain in detail about characteristics of database approach. Provide architecture for DBMS. | | CO1 | 8 |
| b. | Write down the purpose of DBMS and functions of DBMS. | | CO2 | 4 |
| c. | Write short note on the following:  i) Role of data base users and data base administrators.  ii) Data storage and query processor. | | CO1 | 8 |
| **(OR)** | | | | | |
| 2. | a. | Explain about relational algebra. Give any four operations and explain with an example. | | CO3 | 8 |
| b. | Consider the following schema:  Jedi-Teams (master, apprentice)  Jedi(name, side, home-planet)  Government(leader planet, position)  Inhabitants(specie, planet)  Write relational algebra to find all planetary leaders who are apprentices and use the dark side of the force  Give equivalent relational algebra for the following query:  select count(\*), home-planet from Jedi, Inhabitants where specie = 'wookies' and planet = home-planet and side = 'light' group by home-plane | | CO3 | 8 |
| c. | Define single valued and multi valued attributes with example. | | CO3 | 4 |
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| 3. | a. | Consider the following relational database:  STUDENT (name, student#, class, major)  COURSE (course name, course#, credit hours, department)  SECTION (section identifier, course#, semester, year, instructor)  GRADE\_REPORT (student#, section identifier, grade)  Specify the following queries in SQL on the above database schema.  Retrieve the names of all students majoring in ‘CS’ (Computer science).  Retrieve the names of all courses taught by Professor King in 1998.  Delete the record for the student whose name is ‘Smith’ and whose student number is 17.  Retrieve the student names those who have got grade>7.5 | | CO3 | 10 |
| b. | What are the advantages of embedded query language? Give an example of an embedded SQL query. | | CO3 | 6 |
| c. | Explain entity integrity and referential integrity rules in relational model. Show how these are realized in SQL. | | CO3 | 4 |
| **(OR)** | | | | | |
| 4. | a. | | Explain any three aggregate functions and any two set operations with example. | CO3 | 10 |
| b. | | Brief about Triggers and the need for it using suitable example. | CO3 | 5 |
| c. | | Explain the SQL operators BETWEEN-AND, IN, LIKE by taking suitable examples. | CO3 | 5 |
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| 5. | a. | | What is an E-R model? Draw an E-R Diagram for the company database with following:  The company is organized into departments. Each department has a unique name and a unique number with several locations. The department controls a number of projects, each of which has a unique name, unique number and a single location. The names, social security number, address, and salary of each employee is stored. An employee is assigned to one department but may work on several projects, which are not necessarily controlled by the same department. | CO4 | 10 |
| b. | | How do you manage constraints on generalizations? | CO4 | 7 |
| c. | | Distinguish between centralized and client-server systems in data base system architecture. | CO5 | 3 |
| **(OR)** | | | | | |
| 6. | a. | Information in a bank is about customers and their account. Customer has a name, address which consists of house number, area and city, and one or more phone numbers. Account has number, type and balance. We need to record customers who own an account. Account can be held individually or jointly. An account cannot exist without a customer. Draw an E-R diagram, clearly indicating attributes, keys, the cardinality ratios and participation constraints. | | CO4 | 10 |
| b. | Write a note on reduction to relational scheme. | | CO3 | 10 |
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| 7. | a. | Summarize about the B+ - Tree index structure. How the B+ tree index is better than other indexing techniques? | | CO5 | 15 |
| b. | Distinguish between dynamic and static hashing. | | CO5 | 5 |
| **(OR)** | | | | | |
| 8. | a. | When do you prefer ordered indices? Describe with suitable example. | | CO5 | 10 |
| b. | Draw the state diagram of a transaction. | | CO6 | 5 |
| c. | What do you understand on concurrent execution? | | CO6 | 5 |
|  |  | **Compulsory:** | |  |  |
| 9. | a. | Differentiate between functional dependency and multivalued dependency. Explain with example. | | CO3 | 10 |
| b. | Explain 2NF and 3NF in detail. | | CO3 | 10 |