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



**End Semester Examination – Nov/Dec – 2017**

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| **Code :** | **14CS2011** | **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 the overall system architecture of database management system. | CO1 | 14 |
| b. | List four significant differences between a file management system and a DBMS. | CO1 | 6 |
| (OR) | | | | |
| 2. | a. | The questions are based on thefollowing relational schema:  **Emp**(*eid:* integer, *ename:* string, *age:* integer, *salary:* real)  **Works**(*eid:* integer, *did:* integer, *pct time:* integer)  **Dept**(*did:* integer, *dname:* string, *budget:* real, *managerid:* integer)   1. Write the SQL statements required to create the above relations. 2. Write the SQL statements to include appropriate versions of all primary and foreign key integrity constraints. 3. Write an SQL statement to alter the column enamevarchar2(8) to varchar2(14). 4. Write an SQL statement to add `John Doe' as an employee with *eid*= 101, *age* = 32 and *salary* = 15000. 5. Write an SQL statement to give every employee a 10% raise. 6. Write an SQL statement to create user and Ggrant the privileges using TCL Commands. | CO2 | 12 |
| b. | Write short notes on Cartesian product and aggregate functions. | CO2 | 8 |
| 3. | a. | Consider the Following table Emp(Emp\_id,Name, Dept\_name, Salary)  Write SQL statements for the following   1. Find the employee name who is getting lowest salary. 2. Find the department name which has highest average salary. 3. Find all the department where more than 60 employees are working. 4. Find all the employees whose salary is higher than the average salary of their department. | CO2 | 10 |
| b. | Discuss the difference between views and materialized views. | CO2 | 5 |
| c. | List four significant differences between physical and logical data independence. | CO1 | 5 |
| (OR) | | | | |
| 4. | a . | Consider the following database and answer the following:  Customer(Cust\_name,Cust\_street,cust\_city)  Cust\_account(account\_number,branch\_name,balance) Loan(loan\_number,branch\_name,amount)  Borrower(cust\_name,loan\_number)   1. Find all the bank customers having a loan, an account, or both at the bank. 2. Find all customers who have both a loan and an account at the bank.(Union and set membership) 3. Find all customers who have an account, but no loan at the bank. 4. Find the number of depositors for each branch. 5. Find only those branches where the average account balance is more than 50000. | CO2 | 10 |
| b. | Define entity and attribute and list out the types of attributes with examples. | CO3 | 5 |
| c. | How inner join and outer join operation is performed? | CO2 | 5 |
| 5. | a. | A university academic office maintains data about the following entities:  i. Further, the enrollment of students in courses and grades awarded to students in each course they are enrolled for must be appropriately modeled. Construct an E-R diagram for the academic office. Document all assumptions that you make about the mapping constraints.  (a) **Courses:** including number, title, credits, syllabus, and prerequisites;  (b) **Course offerings:** including course number, year, semester, section number, instructor(s), timings, and classroom;  (c)**Students**: including student-id, name, and program;  (d)**Instructors:** including identification number, name, department, and title.  ii. Construct appropriate tables for the above ER Diagram. | CO3 | 15 |
| b. | Define the concept of Generalization and Specialization. Construct appropriate ER Diagram | CO3 | 5 |
| (OR) | | | | |
| 6. | a. | Why do we need Normalization? Is normalization preferred in today’s scenario? | CO3 | 5 |
| b. | State the need for Normalization of a Database and Explain the various Normal forms (1NF, 2NF ,3 NF, BCNF,4 NF and 5 NF ) with appropriate examples. | CO3 | 15 |
| **7.** | a. | Suppose that we decompose the schema R=(A,B,C,D,E) into R1(BCD) and R2(ACE). Show that this decomposition is a Lossless decomposition if the following set F of functional dependencies holds:  F={AB🡪C,C🡪E,B🡪D,E🡪D} | CO3 | 6 |
| b. | Compute the canonical cover for the following relation  R= {A, B, C, D, E}  F= {A🡪 BC  CD🡪 E  B🡪D  E🡪A} | CO3 | 10 |
|  | c | Check whether the following schema is in 2NF. If yes, justify. If No, justify and convert it into 2NF:  Scheme 🡪 {City, Street, HouseNumber, HouseColor, CityPopulation}  key 🡪 {City, Street, HouseNumber}  {City, Street, HouseNumber} 🡪 {HouseColor}  {City}🡪 {CityPopulation} | CO3 | 4 |
| (OR) | | | | |
| 8. | a. | Create a trigger for update of column ‘salary’ in the employee table, which ensures that salary cannot be reduced than the current salary. | CO2 | 10 |
| b. | Describe the architecture of a transaction server. | CO3 | 10 |
|  | | **Compulsory:** |  |  |
| 9. | a. | Write in detail about B+ tree indexes in database and how it remains stable during the insertion, deletion or updation process | CO3 | 12 |
| b. | Explain about different types Indexing techniques. | CO3 | 8 |

ALL THE BEST