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



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

|  |  |  |  |
| --- | --- | --- | --- |
| **Code :** | **14CS2011** | **Duration :** | **3hrs** |
| **Sub. Name :** | **DATABASE SYSTEMS** | **Max. Marks :** | **100** |

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Discuss the differences between a file-processing system and a database systems. | CO1 | 8 |
| b. | Enumerate the duties of database administrator. | CO1 | 6 |
| c. | What are the three levels of abstraction? Explain with neat diagram. | CO3 | 6 |
| **(OR)** | | | | |
| 2. | a. | Illustrate the Data Manipulation Language(DML) and Data definition Language (DDL) commands with syntax and appropriate examples. | CO2 | 8 |
| b. | Describe the database system architecture with a neat diagram. | CO1 | 12 |
|  |  |  |  |  |
| 3. | a. | Consider the following relational database:  *employee (person\_name, street, city) works (person\_name, company\_name, salary) company (company\_name, city) manages (person\_name, manager\_name*  Write the queries for the following :   1. Find the names of all employees who work for “Safe and Trust Bank”. 2. Find the names, address and cities of residence of all employees. 3. Find the names of all employees in the database who do not work for “Safe and Trust bank”. 4. Give all managers a 10 per cent salary raise. 5. Delete all tuples in the works relation for employees of “Hopeful finance”. | CO2 | 10 |
|  | b. | Give a detailed note on aggregate functions and set operations with the appropriate examples. | CO2 | 10 |
| **(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 braanches where the average account balance is more than 50000. | CO2 | 10 |
|  | b. | Explain the basic structure of SQL Queries. | CO2 | 5 |
|  | c. | Create a trigger that prints the change in salary every time salary of an employee is changed. | CO2 | 5 |
|  |  |  |  |  |
| 5. | a. | Describe the steps involved in designing an ER Diagram. List down the different types of ER notation with suitable examples. | CO3 | 8 |
|  | b. | A project Manager handles a number of Projects. Project is identified by a Project ID and there is a starting date, project duration and expected completion date for each project. Other details about the project are - Project name, main technology involved and the customer co-ordinator and his contact details. A number of employees work under a project manager and for each employee, one or more projects are assigned. Each employee is identified by a unique employee number. Other information about the employees are employees age, DOB, qualification, area of Specialization, date of joining in the organization, address (which comprises of Door number, Street number, location, city, PIN).   * Draw an E-R diagram for the above scenario. * Identity the Primary key for each entity * Identify the relation between entities * Identify the composite, multi-valued attributes and derived attributes | CO3 | 12 |
| **(OR)** | | | | |
| 6. | a. | What is a weak entity set? Give an example and draw the notation for representing a weak entity set. | CO3 | 5 |
|  | b. | Convert the following ER Diagram to relational tables. | CO3 | 10 |
|  | c. | Draw the ER notation for aggregation and specialization. Describe it with suitable examples. | CO3 | 5 |
|  |  |  |  |  |
| 7. | a. | Explain the transaction server process structure in detail with a neat block diagram. | CO1 | 15 |
|  | b. | Discuss the client- server architecture with the suitable diagram. | CO1 | 5 |
| **(OR)** | | | | |
| 8. | a. | What is normalization? Why do we need normalization? Explain BCNF with an example. | CO3 | 10 |
|  | b. | Compute F closure (F+) for the following relational schema and functional dependencies.  *R = (A, B, C, G, H, I) F =* { *A* →*B  A* →*C  CG* →*H  CG* →*I  B* →*H*  } | CO3 | 10 |
|  | |  |  |  |
|  | | **Compulsory**: |  |  |
| 9. | a. | Describe the storage structure of indexed sequential files and their access method. | CO1 | 5 |
|  | b. | Write in detail about B+ tree indexes in database and illustrate how it remains stable during the insertion, deletion or updation process. | CO1 | 10 |
|  | c. | Compare and contrast the ordered index and hash index. | CO1 | 5 |