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

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**End Semester Examination – Nov/Dec – 2018**

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| **Code :** | **14CS3005** | **Duration :** | **3hrs** |
| **Sub. Name :** | **ADVANCED 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. |  | Given the following relations and SQL Query, answer the following questions.  Professor (Id, Name, DeptId)   * size: 200 pages, 1000 rows, 50 departments   Teaching (ProfId, CrsCode, Semester)   * size: 1000 pages, 10,000 rows, 4 semesters   SELECT P.Name  FROM Professor P, Teaching T  WHERE P.Id = T.ProfId  AND P. DeptId = ‘CS’  AND T.Semester = ‘Odd18-19’ |  |  |
| a. | Develop a query evaluation plan using a relational algebra tree assuming there are no indexes and data is not sorted on any attribute. | CO1 | 5 |
| b. | Construct alternative plans to improve performance of the above plan by   1. Pushing selections 2. Using indexes   Compare and contrast the cost involved in each method. | CO1 | 15 |
| (OR) | | | | |
| 2. | a. | State the reasons that motivates concurrent execution. | CO2 | 4 |
| b. | With illustration of a real-time scenario, explain in detail the anomalies happened during interleaved execution. | CO2 | 16 |
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| 3. |  | Consider the following schedules. The actions are listed in the order they are scheduled, and prefixed with the transaction name.  S1: T1:R(X), T2:R(X), T1:W(Y), T2:W(Y), T1:R(Y), T2:R(Y)  S2: T3:W(X), T1:R(X), T1:W(Y), T2:R(Z), T2:W(Z), T3:R(Z)  For each of the schedules, answer the following questions. |  |  |
| a. | Draw the precedence graph of both the schedules. | CO2 | 5 |
| b. | Is the schedule conflict-serializable? If so, what are all the conflict equivalent serial schedules? | CO2 | 5 |
| c. | Is the schedule view-serializable? If so, what are all the view equivalent serial schedules? | CO2 | 5 |
| d. | Write a note on strict 2PL protocol. | CO2 | 5 |
| (OR) | | | | |
| 4. | a. | Explain in detail the log record and the different types of log record. | CO2 | 10 |
| b. | Illustrate with example how the following tables help in crash recovery  i) Transaction table ii) Dirty Page table | CO2 | 10 |
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| 5. | a. | Describe the six high-level guidelines for index selection with suitable examples. | CO1 | 6 |
| b. | With suitable illustration, explain the different ways of tuning the database. | CO1 | 14 |
| ­­(OR) | | | | |
| 6. | a. | Describe the choice of encrypytion and decryption keys in public –key encryption and how they are used to encrypt and decrypt data. Prove that the RSA scheme cannot be compromised. | CO3 | 15 |
| b. | Write a short note on mandatory access control. | CO3 | 5 |
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| 7. | a. | Write a short note on the three different types of parallel database architectures. | CO3 | 5 |
| b. | Describe in detail the steps taken during normal execution in a distributed database with Two-Phase Commit(2PC) protocol and Three-Phase Commit (3PC) protocol as a part of recovery after failure. | CO3 | 15 |
| (OR) | | | | |
| 8. |  | Given a collection of documents, explain the following: |  |  |
|  | i) Weighting of terms by TF-IDF scheme. | CO1 | 10 |
|  | | ii) Ranking by document similarity. | CO1 | 10 |
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|  | | **Compulsory**: |  |  |
| 9. | a. | Explain in detail with examples, the applications that involve spatial data. | CO3 | 10 |
| b. | With neat illustration, describe the process of searching and inserting points in a grid file. | CO3 | 10 |