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



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

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

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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. | a. | Explain the goal of query optimization and its importance. | CO1 | 6 |
| b. | What were the important design decisions made in the System R optimizer? | CO1 | 7 |
| c. | Why do query optimizers consider only left-deep join trees? Give an example of a query and a plan that would not be considered because of this restriction. | CO1 | 7 |
| (OR) | | | | |
| 2. | a. | What is the phantom problem? Can it occur in a database where the set of database objects is fixed and only the values of objects can be changed? | CO2 | 10 |
| b. | Consider a database with objects X and Y and assume that there are two transactions T 1 and T 2. Transaction T 1 reads objects X and Y and then writes object X. Transaction T 2 reads objects X and Y and then writes objects X and Y .   1. Give an example schedule with actions of transactions T 1 and T 2 on objects X and Y that results in a write-read conflict. 2. Give an example schedule with actions of transactions T 1 and T 2 on objects X and Y that results in a read-write conflict. 3. Give an example schedule with actions of transactions T 1 and T 2 on objects X and Y that results in a write-write conflict. 4. For each of the three schedules, show that Strict 2PL disallows the schedule. | CO2 | 10 |
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| 3. | a. | Discuss the need for database tuning and describe the important decisions that are made during physical Database design and database tuning. | CO2 | 10 |
|  | b. | Consider the following BCNF relations, which describe employees and departments that they work in:  Emp (*eid, sal, did*)  Dept (*did, location, budget*)  You are told that the following queries are extremely important:  Find the location where a user-specified employee works. Check whether the budget of a department is greater than the salary of each employee in that department.  Describe the physical design that you would choose for this relation. That is, what kind of a file structure would you choose for these relations, and what indexes would you create? | CO2 | 10 |
| (OR) | | | | |
| 4. | a. | How does the recovery manager ensure atomicity of transactions? How does it ensure durability? | CO2 | 4 |
|  | b. | What are the roles of the Analysis, Redo, and Undo phases in ARIES? Consider the following execution.     1. What is done during Analysis phase? 2. What is done during Redo phase? 3. What is done during Undo phase? | CO2 | 16 |
| 5. | a. | Give an example of how covert channels can be used to defeat the Bell-LaPadula model. | CO2 | 10 |
|  | b. | Describe a scenario in which discretionary access controls are required to enforce a security policy that cannot be enforced using only mandatory controls. | CO2 | 10 |
| (OR) | | | | |
| 6. | a. | Describe the three alternative distributed dbms architecture. | CO3 | 10 |
|  | b. | A relation can be distributed by fragmenting it or replicating it across several sites. Explain these concepts and how they differ? Also, distinguish between horizontal and vertical fragmentation | CO3 | 10 |
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| 7. |  | Explain how the spatial data is managed using R Trees | CO3 | 20 |
| (OR) | | | | |
| 8. | a. | Describe Inverted Index and Signature file index structure for text | CO1 | 10 |
|  | b. | How the XML documents can be indexed? What is the difference between indexing on structure and indexing on value? | CO1 | 10 |
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|  | | **Compulsory**: |  |  |
| 9. |  | Discuss in detail about Mobile and Multimedia databases. | CO3 | 20 |

ALL THE BEST