**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI**
**(END SEMESTER EXAMINATION)**

**CLASS: M.TECH** **SEMESTER : II**
**BRANCH: CSE** **SESSION : SP/2025**

**SUBJECT: CS511 ADVANCED DATABASE MANAGEMENT SYSTEM**

**TIME: 3 Hours** **FULL MARKS: 50**

**INSTRUCTIONS:**
**1. The question paper contains 5 questions each of 10 marks and total 50 marks.**
**2. Attempt all questions.**
**3. The missing data, if any, may be assumed suitably.**
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
**5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.**

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| Q.1(a) | Describe the types of serializability and explain how they affect transaction scheduling. | [5] | CO1 | 4 |
| Q.1(b) | What is a schedule? Define the concepts of recoverable and cascadeless schedule and compare them in terms of their recoverability. | [5] | CO1 | 4 |
| Q.2(a) | Discuss the problem of deadlock and the different approaches to dealing with deadlock. | [5] | CO2 | 3 |
| Q.2(b) | Explain the Two-Phase Locking (2PL) protocol in detail. What are its variations, and how do they help in maintaining serializability? | [5] | CO2 | 4 |
| Q.3(a) | Explain in detail the recovery technique based on deferred update. Include the steps taken during transaction execution and after system failure. | [5] | CO3 | 2 |
| Q.3(b) | What is shadow paging? Compare it with log-based recovery methods. | [5] | CO3 | 3 |
| Q.4(a) | Compare query processing in centralized and distributed databases with examples. | [5] | CO4 | 3 |
| Q.4(b) | What is data fragmentation in distributed databases? Explain the purpose, types and the criteria for fragmentation. | [5] | CO4 | 2 |
| Q.5(a) | Explain the process of building a data warehouse. Describe the main steps involved, including data extraction, transformation, loading (ETL), and schema design. | [5] | CO5 | 2 |
| Q.5(b) | Discuss the key characteristics of a data warehouse. How do features like subject orientation, integration, time-variance, and non-volatility contribute to its functionality? | [5] | CO5 | 3 |

**::::::26/04/2025::::::E**