

# Question Paper

Exam Date & Time: 24-May-2023 (10:00 AM - 01:00 PM)



## MANIPAL ACADEMY OF HIGHER EDUCATION

Manipal School of Information Sciences (MSIS), Manipal  
Second Semester Master of Engineering - ME (Cloud Computing) Degree Examination - May 2023

### Java Web Technology and Database [CDC 5204]

Marks: 100

Duration: 180 mins.

Wednesday, May 24, 2023

Answer all the questions.

- 1) Explain the mechanism of developing the dynamic web application using the Java Servlets - briefing on the configuration steps involved and servlet life cycle. (CO2, L2, PO8) (10 Marks) (10)
- 2) Consider a database with the following relations and write the SQL query statements (CO1, L3, PO3) (2 marks each) (10)  
loan (loan-number, branch-name, amount)  
customer (customer-name, customer-street, customer-city)  
depositor (customer-name, account-number)  
borrower (customer-name, loan-number)  
account (account-number, branch-name, balance)  
branch (branch-name, branch-city, assets)  
  - a) Find all customers who have both a loan and an account
  - b) Find all customers who have an account but no loan.
  - c) Find the average account balance at the Perryridge branch.
  - d) Find the number of tuples in the customer relation.
  - e) Find the number of depositors in the bank
- 3) Answer following (CO1, L2, PO2) (5 Marks each) (10)  
  - a. Discuss the steps involved in Query processing?
  - b. Highlight the difference between Heuristic versus cost based optimization
- 4) Explain the importance of Schedules in the realization of Concurrency. Illustrate the difference between Deadlock and Starvation with appropriate example of schedule. (CO1, L3, PO1) (5+5 Marks) (10)
- 5) Explain the significance of Two-phase commit and working principle. Come up with a typical application to illustrate the usage and your implementation details. (CO1, L3, PO3) (3+7 Marks) (10)
- 6) Explain the CAP theorem and its significance (CO3, L2, PO2) (10 Marks) (10)
- 7) Explain the characteristics one need to consider before finalizing the type of No SQL database suitable for an application. (CO3, L2, PO2) (10 Marks) (10)
- 8) Answer following . (CO2, L3, PO5) (5 Marks each) (10)  
  - a. Explain the Client server communication model used in RESTful Service.
  - b. Describe the steps involved in setting up a REST Service and Client
- 9) Answer following (CO2, L2, PO2) (5 Marks each) (10)  
  - a. Illustrate the Actions and Events that are part of Web Socket functioning.
  - b. Discuss the scenarios where the RESTful web service will be preferred over Web Sockets and vice versa.

- 10) Write a note on Significance of Database Sharding and Describe different architecture followed for DB Sharding (CO1, L2, PO5) (10 Marks) (10)

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