

# Question Paper

Exam Date & Time: 02-May-2024 (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 - April / May 2024

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

Marks: 100

Duration: 180 mins.

Thursday, May 02, 2024

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, PO1) (10 Marks) (10)
- 2) Consider the following relations: (CO1, PO2) (5 Marks each) (10)  
Student(snum: integer, sname: string, major: string, level: string, age: integer)  
Class(name: string, meets at: string, room: string, fid: integer)  
Enrolled(snum: integer, cname: string)  
Faculty(fid: integer, fname: string, deptid: integer)  
  
The meaning of these relations is straightforward; for example, Enrolled has one record per student-class pair such that the student is enrolled in the class.  
  
Write the following queries in SQL. No duplicates should be printed in any of the Answers  
  
a. Find the age of the oldest student who is either a History major or enrolled in a course taught by Faculty with name = "XYZ".  
b. Find the names of all classes that either meet in room R128 or have five or more students enrolled.
- 3) Answer following (CO1, PO2) (5 Marks each) (10)  
  
a. Explain the significance of Primary Key and Foreign Key constraints in a database table definition.  
b. Illustrate the steps involved in Query processing
- 4) Explain the importance of Schedules in the realization of Concurrency. Illustrate the difference between Deadlock and Starvation with appropriate example of schedule. (CO1, PO2) (5 Marks each) (10)
- 5) Explain the mechanism of two-phase commit and its significance. (CO1, PO2) (10 Marks) (10)
- 6) Answer the following (CO3, PO4) (5 Marks each) (10)  
a. Distinguish between Horizontal and Vertical scaling  
b. Distinguish between CA and CP with respect to CAP theorem
- 7) Explain the characteristics one need to consider before finalizing the type of No SQL database suitable for an application. (CO3, PO4) (10 Marks) (10)
- 8) Answer following . (CO2, PO1) (5 Marks each) (10)  
  
a. Explain the REST API's architectural principles.  
b. Illustrate the differences between JSON and XML
- 9) Answer following (CO2, PO1) (5 Marks each) (10)

- a. Illustrate the Significance of Web Server and App Server in deploying a Web Application.
- b. Discuss the scenarios where the RESTful web service will be preferred over Web Sockets and vice versa.

10)

Answer following (CO3, PO4) (5 Marks each)

(10)

- a. Explain the Advantages of using Distributed Database systems.
- b. Illustrate the difference between Homogeneous and Heterogeneous systems with the context of distributed database systems.

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