BACHELOR OF TECHNOLOGY (CBCS) (2021-COURSE)

Computer Science & Engineering

B. Tech. Sem - III :SUMMER : 2023

SUBJECT : ITC-I: OBJECT ORIENTED METHODOLOGY

Day : Tuesday

Time : 02:30 PM-05:30 PM

Date : 16-05-2023

S-25314-2023

Max. Marks : 60

N.B.:

1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Draw neat and labeled diagram **WHEREVER** necessary.
4) Assume suitable data, if necessary.

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**Q.1** Draw and explain concept of JDK, JRE and JVM with suitable diagram. **(10)**

**OR**

**Q.1** List and explain JAVA data types with suitable example. **(10)**

**Q.2** Define class and object in JAVA. Write a program to display student information using class and object. **(10)**

**OR**

**Q.2** List and explain Access modifiers in JAVA with suitable example. **(10)**

**Q.3** Write Java Program to illustrate "constructor overloading". **(10)**

**OR**

**Q.3** Write Java Program with takes two 3X3 matrices as input and finds the sum of the two matrices. Define constructor for initialization of matrix objects. **(10)**

**Q.4** Describe the uses of 'super' keyword in JAVA with suitable example. **(10)**

**OR**

**Q.4** Write a program to Implement single level inheritance assuming suitable data to write program. **(10)**

**Q.5** Define multithreading in JAVA. Explain inter thread communication with the help of suitable examples. **(10)**

**OR**

**Q.5** How exception handling is important in JAVA? Define distinguish between checked and unchecked exception. **(10)**

**Q.6** Describe how to use JButton class to create push Button. **(10)**

**OR**

**Q.6** Define Layout Managers. Construct a frame with necessary component for bus reservation system of an agent. **(10)**

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BACHELOR OF TECHNOLOGY (CBCS) (2021-COURSE)
Computer Science & Engineering-AI&ML
B. Tech. Sem - III :SUMMER : 2023
SUBJECT : DATABASE MANAGEMENT SYSTEMS

Day : Tuesday | Time : 02:30 PM-05:30 PM

Date : 16-05-2023 | S-23939-2023 | Max. Marks : 60

**N.B.**

1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Use of non - programmable **CALCULATOR** is allowed.

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**Q.1** **a)** Explain the terms candidate key, primary key, foreign key and super key. **(05)**

**b)** Distinguish between file management system and database management system. **(05)**

**OR**

**Q.1** Discuss the role of DBA. Describe different types of attributes **(10)**

**Q.2** Draw the ER diagram of a hospital management system and explain. **(10)**

**OR**

**Q.2** A university registrar's office maintains data about the following entities: **(10)**
1. courses, including number, title, credits, syllabus, and prerequisites;
2. course offerings, including course number, year, semester, section number, instructor(s), timings, and classroom;
3. students, including student-id, name, and program;
4. Instructors, including identification number, name, department, and title.

Further, the enrollment of students in courses and grades awarded to students in each course they are enrolled for must be appropriately modeled. Construct an E-R diagram for the registrars.

Documents all assumptions that you make about the mapping constraints.

**Q.3** Consider the relational database: **(10)**
Employee (person-name, street, city)
Works (person-name, company name, salary)
Company (company name, city)
Manages (person-name, manager-name)

Write down appropriate SQL statement for the following queries:
a) Find the name of all employees who work for 'SBI bank'.
b) Find name, street address, cities of residence of all employees who work for 'SBI Bank' and earn more than Rs. 5,00,000 per annum.
c) Find the second highest salary for employees in 'SBI bank'.
d) Find the names of all employees who live in the same city and on the same street as do their manager.
e) Find the company that has the most employees.

**OR**

**Q.3** Write sql syntax for creating table EMP (EMPNO, ENAME, SALARY, JDATE, DIS). Write sql syntax for insert two rows in table, delete one row from table, update salary and view whole table. What is the different operation performing using DML Explain? **(10)**

**Q.4** **a)** Discuss the ACID properties of transactions. **(03)**

**b)** If $R$ - $(A, B, C, D)$ and the $FDs$ are $\{AB \rightarrow CE, E \rightarrow AB, C \rightarrow D\}$. Why $R$ is in 2 NF, but not in 3 NF? Explain. **(04)**

c) Show that if a relation schema is in BCNF, then it is in 3 NF but if a relation schema is in 3 NF then it is not necessary in BCNF. Give examples. **(03)**

**OR**

**Q.4** **a)** Find out the closure of attribute set (AD)i.e. (AD) + in the R. Set of FD's F are as given below: **(05)**

$R = \{A, B, C, D, E J\}$,

$FD = \{B \rightarrow CD, D \rightarrow E, B \rightarrow A, E \rightarrow C, AD \rightarrow B\}$.

**b)** Consider the following two sets of FDs: **(05)**

$F = \{A \rightarrow C, AC \rightarrow D, E \rightarrow AD. E \rightarrow H\}$

$G = \{A \rightarrow CD, E \rightarrow AH\}$.

Check whether they are equivalent. Justify your answer.

**Q.5** **a)** What is 2-phase locking protocol? How does it guarantee serializability? **(05)**

**b)** Explain log-based recovery and checkpoints. **(05)**

**OR**

**Q.5** **a)** Explain any 4 Types of Relational operations with example? **(10)**

**Q.6** **a)** Explain architectural model for distributed DBMS. **(05)**

**b)** Compare and Contrast Extendible Hashing with Linear Hashing? **(05)**

**OR**

**Q.6** Write short notes on the following: **(10)**

a) File indexing

b) B+ tree

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