4E1305

Total No. of Questions : 22

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4E1305

B.Tech. IV-Sem. (Main/Back) Exam. - 2024

COMPUTER SCIENCE AND ENGINEERING (AI)

4CAI4-05, Database Management System

CS, IT, AID, CAI

Time : 3 Hours

Maximum Marks : 70

Instructions to Candidates :

Attempt all ten questions from Part-A, five questions out of seven questions from Part-B and three questions out of five questions from Part-C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used / calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in Form No. 205)

1. .....

2. .....

PART - A **[10×2=20]**

Answer should be given up to 25 words only

All questions are compulsory.

Each question carries 02 marks

Q.1. How candidate key is different from super key?

Q.2. Differentiate between structured and unstructured data.

Q.3. What do you mean by Attributes?

Q.4. Explain the concepts of Primary Key.

Q.5. List out any three responsibilities of Database Administrator.

Q.6. What is Indexing?

Q.7. What is Weak Entity set and Strong Entity set?

Q.8. Define query language.

Q.9. Define instance and schema.

Q.10. Define null values.

PART-B

Analytical / Problem-solving questions. Attempt any 05 questions. **[5x4=20]**

Each question carries 04 marks.

Q.1. Define transaction. Explain various states of transaction with suitable diagram.

Q.2. What is Data Model? Explain its types.

Q.3. What is DBMS? Write difference between File System and DBMS.

Q.4. Explain the Three-level Architecture of DBMS. Also mention its advantages.

Q.5. Discuss the clear difference between specialization and generalization with the help of an example. Is it prossible to represent their difference with the help of an E-R diagram? Explain.

Q.6. Discuss the different types of database failures that may occur in a database environment.

Q.7. Differentiate between immediate update and deferred update recovery techniques.

PART - C [3×10=30]

Descriptive / Analytical / Problem-solving / Design questions.

Attempt any 03 questions. Each question carries 10 marks.

Q.1. (a) Consider the following database tables and answer queries using SQL :

- Employee (emp_no, name, skill, pay_rate)
- Position (posting_no, skill)
- Duty-allocation (posting_no, emp_no, day, shift)

(i) Get employee whose rate of pay is more than or equal to the rate of pay of employee "XYZ".

(ii) Find the employee with the lowest pay rate.

(iii) Get a count of different employee on each shift.

(b) What are Recoverable Schedules, and Cascadeless Schedules? Explain with suitable example.

Q.2. (a) What are relational set operators? Explain with example.

(b) What are the challenges in the database design?

Q.3. (a) What is log based recovery? Explain immediate database modification technique for database recovery.

(b) Explain the following operations in relational algebra with suitable examples:

(i) Rename

(ii) Natural Join

(iii) Projection

(iv) Groupin

Q.4. (a) Compute the Closure of the following set F of functional dependencies for relation schema :

$R = (A, B, C, D, E)$

$F = \{A \rightarrow BC, CD \rightarrow E, B \rightarrow D, E \rightarrow A\}$

(b) Write short notes on the following :

(i) Multi-valued dependencies

(ii) 3NF

Q.5. Write short notes on the following :

(i) Deadlock Handling

(ii) Database Recovery schemes

(iii) Triggers and Active Databases

(iv) Schema Refinement and Functional Dependencies

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