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Roll No. : .....

**322556(22)**

**B. E. (Fifth Semester) Examination, Nov.-Dec. 2021**

**(New Scheme)**

**(CSE Branch)**

**DATABASE MANAGEMENT SYSTEM**

**Time Allowed : Three hours**

**Maximum Marks : 80**

**Minimum Pass Marks : 28**

**Note : Question no. (a) of each unit is mandatory and attempt any two parts from (b), (c) and (d). State assumptions clearly (in any).**

**Unit-I**

1. (a) What is data dictionary?

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- (b) Explain 3 levels of data abstraction with example. 7
- (c) Explain Strong and Weak entity sets with example 7
- (d) Draw an entity-Relationship diagram of a manufacturing company which records information about the projects it has on hand, the parts used in projects, the supplier who supply the parts, the warehouses in which those parts are stored, the employees who work on these projects. 7

**Unit-II**

- 2. (a) What is an unsafe query? Explain with example. 2
- (b) Explain 6 basic operations of Relation Algebra with example 7
- (c) Explain integrity constraints with example. 7
- (d) Consider a relation schema : 7

Student (id, name)

Enrolled (id, code)

Subject (code, lecturer)

Write the following queries in relational algebra :

- (i) What are the names of a student enrolled in CS-103?

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- (ii) Which subject s Mr. Sachin teaching?
- (iii) Who teaches CS-103?
- (iv) Who teaches at least two different subjects.
- (v) What are the names of students in both CS-103 and CS-104?

**Unit-III**

- 3. (a) Explain any two GROUP functions with example. 2
- (b) Explain the following constructs in SQL with examples : 7
  - (i) Insert
  - (ii) Update
  - (iii) Alter
  - (iv) Rollback
- (c) What is a cursor? Explain cursor attributes with examples. 7
- (d) Given a relation schema below : 7

Supplier (sno, sname, status, city)

Parts (pno, pname, color, city, weight)

Supplies (sno, pno, qty)

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Write the following queries in SQL :

- (i) Get supplier name for suppliers who do not supply part 'P<sub>2</sub>'.
- (ii) Get supplier name for suppliers who supply both parts 'P<sub>1</sub>' and 'P<sub>2</sub>'.
- (iii) Get supplier name for suppliers who supply at least one red part.
- (iv) Get supplier number for suppliers with status value less than the current maximum status value in supplier table.
- (v) Delete all shipments from suppliers in 'Bhopal'.

#### Unit-IV

4. (a) Explain partial dependency with example. 2
- (b) Explain the difference between 3 NF and BCNF with example. 7
- (c) Explain timestamp ordering protocol with example. 7
- (d) Consider a relation schema R (A, B, C, D, E, F) with a set of functional dependencies  
 $F = \{ ABD \rightarrow C, C \rightarrow BE, AD \rightarrow BF, B \rightarrow E \}$ . 7

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Find :

- (i) Candidate keys of R
- (ii) Canonical Cover
- (iii) Highest normal form of R

#### Unit-V

5. (a) What is a checkpoint? Explain with example. 2
- (b) Explain log based recovery of database with example. 7
- (c) Explain B + tree index with example. 7
- (d) Explain sparse, dense, clustered and primary index with example. 7