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B. E. (Fifth Semester) Examination, April-May/ Nov.-Dec, 2020

(New Scheme)

(IT Engg. Branch)

DATABASE MANAGEMENT SYSTEM

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

***Note** : Attempt all questions. Part (a) is compulsory from each questions. Attempt any two parts from (b), (c) and (d).*

Unit-I

1. (a) Define weak entity with example. 2

(b) Construct a B+ tree for the following set of key values (3, 4, 6, 8, 12, 17, 19, 23, 29, 31). Assume that tree is initially empty, value are added in ascending order and the order of B+ tree is 3. 7

(c) Construct an E-R diagram for a car insurance company that has a set of customers, each of whom owns one or more cars. Each car has associated with it, zero to any number of recorded accidents. 7

(d) Differentiate between B tree and B+ tree with example. 7

Unit-II

2. (a) Define Alternative Key. 2

(b) What are Constraints? Explain constraints that are used in SQL with syntax. 7

(c) Employee (person_name, street, city)

Works (person_name, company_name, salary)

Company (company_name, city)

Manages (person_name, manager_name)

Consider the above relational database. Give an expression in the relational algebra to express each of the following queries : 7

(i) Find the names of all employees who work for first bank corporation.

(ii) Find the names of all employees in this data-base who live in the same city as the company for which they work.

(iii) Find the names, street address and cities of residence of all employees who work for first bank corporation and earn more than 6,00,000 Rs. per annum.

(d) Differentiate between simple views and complex views. 7

Unit-III

3. (a) Define BCNF. 2

(b) Compute the closure of relational schema R(ABCDE). The set of FD's are :

(i) $A \rightarrow BC$

(ii) $CD \rightarrow E$

(iii) $B \rightarrow D$

(iv) $E \rightarrow A$

Find the key attribute of R. Also find all candidate keys. 7

(c) Suppose we have given set of functional dependencies :

(i) $X \rightarrow W$

(ii) $WZ \rightarrow XY$

(iii) $Y \rightarrow WXZ$

Find the canonical form. 7

(d) What are functional dependencies? Explain the types of functional dependencies with examples. 7

Unit-IV

4. (a) Define transaction and list out the types of failure occurs during transaction processing. 2

(b) Explain the working of query optimizer with an example. 7

(c) Schedule 1

T_1	T_2	T_3
R (X)		
	W (X)	
W (X)		W (X)

Draw the precedence graph for the above schedule and prove, whether the given schedule is conflict serializable or not? 7

(d) Explain the various stages of query processing. 7

Unit-V

5. (a) What is Checkpoint? 2

(b) Explain the working of shadow paging with a neat diagram. 7

(c) Explain time stamp ordering protocol in detail. 7

(d) Write short notes on : 7

(i) Two phase locking protocol

(ii) Validation-Based protocol