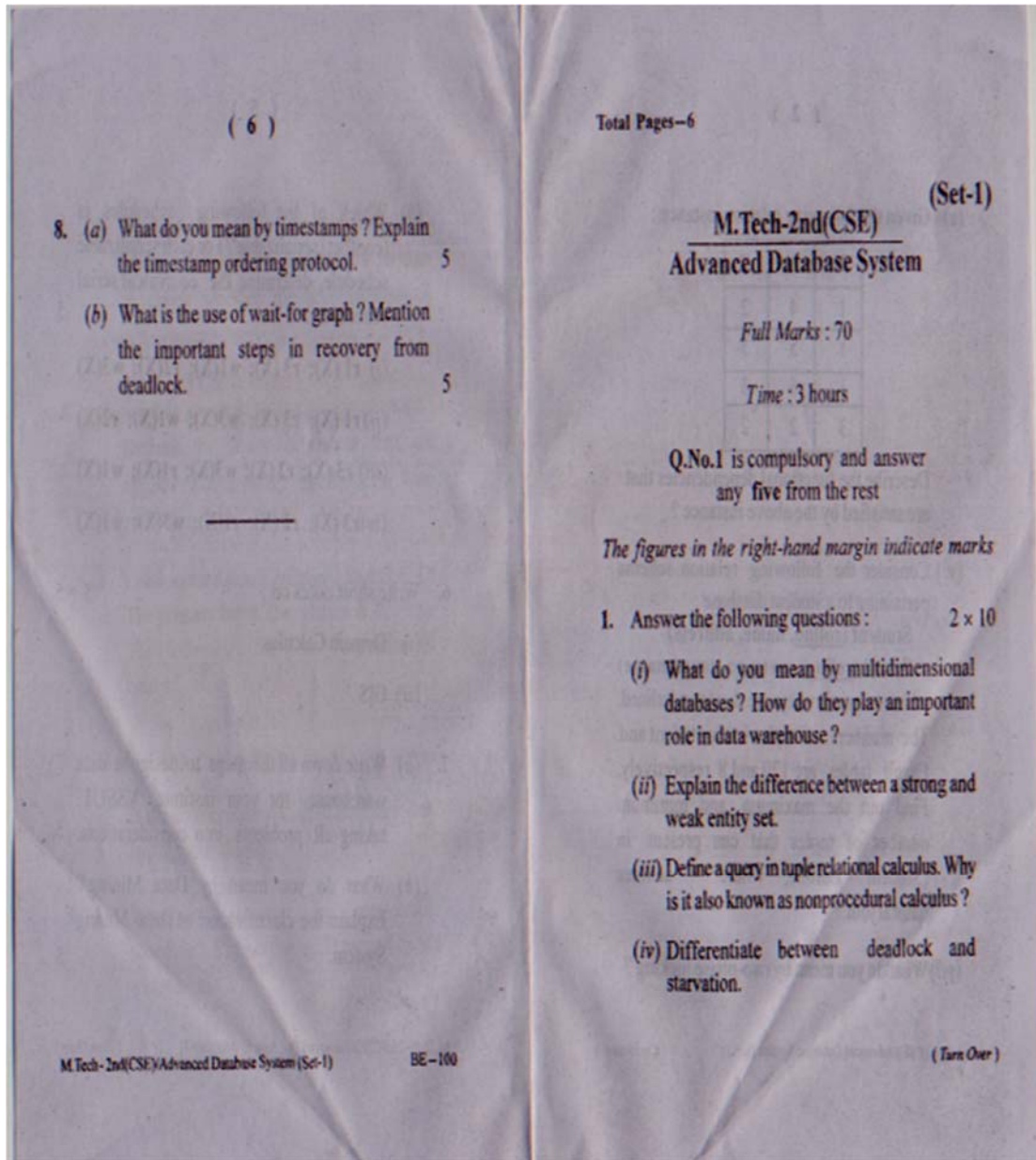


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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
& INFORMATION TECHNOLOGY
SESSION 2014-2015 (EVEN SEMESTER)



(2)

(v) Given the following relation instance :

X	Y	Z
1	4	2
1	5	3
1	6	3
3	2	2

Describe the functional dependencies that are satisfied by the above instance ?

(vi) Consider the following relation schema pertaining to a student database :

Student (rollno, name, address)

Enroll (rollno, courseno, coursename)

where the primary keys are shown underlined.

The numbers of tuples in the student and Enroll tables are 120 and 8 respectively.

Find out the maximum and minimum number of tuples that can present in (Student * Enroll), where '*' denotes natural join ?

(vii) What do you mean by two-phase locking ?

(3)

(viii) What are the different transaction failures that may occur in a database environment ?

(ix) Can a data mining system generate only interesting patterns ? Justify your answer.

(x) What is transitive dependency ? Give one example.

2. (a) Explain the architecture of a Database system with a neat diagram. Write the importance of mapping among different schema levels. 5

(b) State the types of Database failure and explain the corresponding Database Recovery technique. 5

3. (a) The relation book (title, price) contains the titles and prices of different books. Assuming that no two books have the same price, find out the respective SQL query for the following tasks : 5

(i) Title of the most expensive book

(ii) Title of the 5th most expensive book.

(4)

- (b) What is dependency preserving decomposition? Suggest an appropriate algorithm to check whether the decomposition is dependency preserving. 5
4. (a) What do you mean by heuristic optimization? Discuss the main heuristics that are applied during query optimization with examples. 5
- (b) Consider the following relation: $R(A, B, C, D)$
The primary key of the relation is A .
The following functional dependencies hold:
 $A \rightarrow B, C$
 $B \rightarrow D$
- Is the above relation in third normal form? Justify your answer. 5
5. (a) What do you mean by recoverable schedule? Explain the ACID properties of a transaction. 5

(5)

- (b) Which of the following schedules is (conflict) serializable? For each serializable schedule, determine the equivalent serial schedules: 5
- (i) $r1(X); r3(X); w1(X); r2(X); w3(X)$
(ii) $r1(X); r3(X); w3(X); w1(X); r2(X)$
(iii) $r3(X); r2(X); w3(X); r1(X); w1(X)$
(iv) $r3(X); r2(X); r1(X); w3(X); w1(X)$
6. Write short notes on: 5+5
- (i) Domain Calculus
(ii) GIS
7. (a) Write down all the steps to design a data warehouse for your institute 'VSSUT' taking all problems into considerations. 5
- (b) What do you mean by Data Mining? Explain the classification of Data Mining System. 5