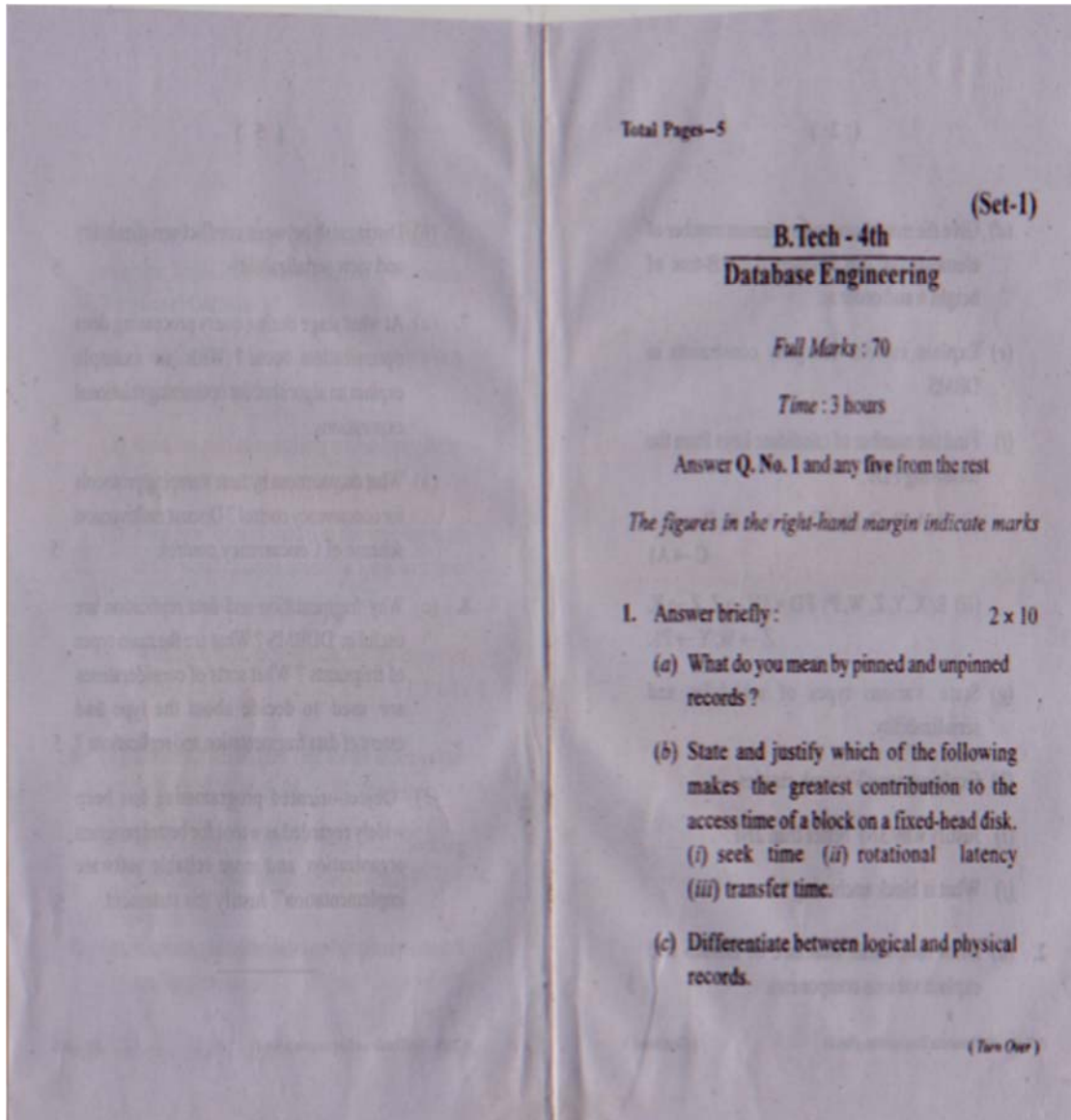


VEER SURENDRA SAI UNIVERSITY OF TECHNOLOGY, BURLA
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
& INFORMATION TECHNOLOGY
SESSION 2014-2015 (EVEN SEMESTER)



- (d) Give the maximum and minimum number of elements that can be inserted in a B-tree of height h and order m .
- (e) Explain various Integrity constraints in DBMS.
- (f) Find the number of candidate keys from the following FDs:
- (i) $R(A, B, C, D)$ $FD = \{A \rightarrow B, B \rightarrow C, C \rightarrow A\}$
- (ii) $R(X, Y, Z, W, P)$ $FD = \{Y \rightarrow Z, Z \rightarrow Y, Z \rightarrow W, Y \rightarrow P\}$.
- (g) State various types of schedules and serializability.
- (h) Explain strong Vs weak entities.
- (i) Justify why 3NF better than 2NF.
- (j) What is block anchoring?
2. (a) Draw the overall structure of DBMS and explain various components. 5

- (b) Draw an ER-diagram for handling an issue section of a college library. Identify various entities and their relationships. 5
3. (a) What do you mean by decomposition of a relation? Consider a relational scheme $R(A, B, C, D, E, F)$ and Functional Dependencies $(A \rightarrow BC, C \rightarrow A, D \rightarrow E, F \rightarrow A, E \rightarrow D)$. Is the decomposition of R into $R_1(A, C, D)$, $R_2(B, C, D)$ and $R_3(E, F, D)$ lossless? Explain the requirements for lossless decomposition and dependency preserving. 5
- (b) What do you mean by a referential Integrity Constraint? What other constraints are available in DBMS? Explain the constraints with examples. 5
4. Consider the following schema:
- Suppliers (sid : integer, sname : string,
address : string)
- Parts (pid : integer, pname : string, color : string)
- Catalog(sid : integer, pid : integer, cost : real)

(4)

Write the following queries in Relational Algebra, Tuple Relational Calculus and Domain Relational Calculus :

- (a) Find the sids of suppliers who supply every red or green part. 5
- (b) Find the sids of suppliers who supply every red part or supply every green part. 5
- (c) Find pairs of sids such that the supplier with the first sid charges more for some part than the supplier with the second sid. 5
- (d) Write the SQL expression for the query in part-(c). $3 + 3 + 3 + 1$ 5
5. (a) Construct a B and B+ Tree for the index values 5, 9, 45, 2, 5, 9, 6, 95, 9, 80, 1, 60, 66. 5
- (b) What benefit does strict two-phase locking provide? What disadvantages result? 5
- 2 6. (a) Explain the optimistic concurrency control techniques. 5

(5)

- (b) Distinguish between conflict serializability and view serializability. 5
7. (a) At what stage during query processing does optimization occur? With an example explain an algorithm for optimizing relational expressions. 5
- (b) What do you mean by time stamping protocols for concurrency control? Discuss multiversion scheme of Concurrency control. 5
8. (a) Why fragmentation and data replication are useful in DDBMS? What are the main types of fragments? What sorts of considerations are used to decide about the type and extent of data fragmentation and replications? 5
- (b) "Object-oriented programming has been widely regarded as a tool for better program organization and more reliable software implementation". Justify this statement. 5