

CS IT 2015

(Set-1)

B.Tech - 4th
Database Engineering

Full Marks 70

Time 3 hours

Answer Q. No. 1 and any five from the rest

*The figures in the right-hand margin indicate marks*1. Answer briefly 2 x 10

- (a) What do you mean by pinned and unpinned records?
- (b) State and justify which of the following makes the greatest contribution to the access time of a block on a fixed-head disk.
(i) seek time (ii) rotational latency
(iii) transfer time.
- (c) Differentiate between logical and physical records.

(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) 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