Q. P. Code: 22965

(3 hours) **Total Marks:80**

NOTE:

I. **Question No. 1** is Compulsory
II. Attempt any **THREE** question from 2 to 6

Q.1 Write a short note on following **(any Four)** 20

(a) Structured Data Types
(b) Strong Entity and Weak Entity
(c) B tree VS B^+ Tree
(d) ACID properties of transaction
(e) Objects,Oids and Reference Types
(f) Role of DBA

Q.2 (a) A large bank has several branches at different places. 10

i) Each branch is managed by a manager
ii) Each branch maintains the account details of the customer.
iii) The customer may open the saving current and FD accounts as single and joint operations.
iv) The bank also provides the loan for various purposes
v) Bank keeps record of each transaction by the customer to his account.
vi) All the branches have employees for different operations.

Construct an ER diagram for the above system. Document all assumptions that you make for designing.

(b) Explain the architecture of database system and also explain how it is different from conventional file system. 10

Q.3 (a) Explain 1NF, 2NF, 3NF with the help of an example. Normalize the below table till 3NF. 10

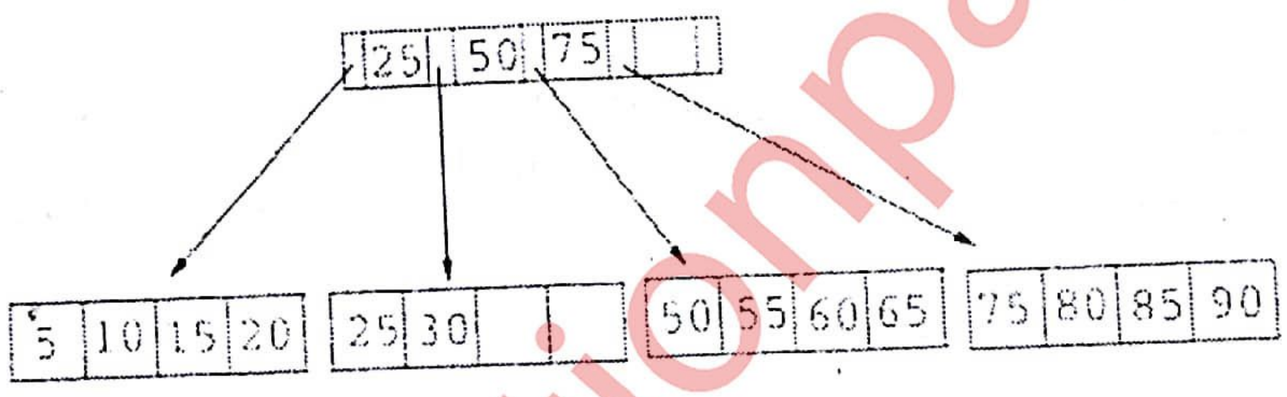
Full Names	Physical Address	Movies rented	Salutation	Category
Janet Jones	First Street Plot No 4	Pirates of the Caribbean, Clash of the Titans	Ms.	Action, Action
Robert Phil	3rd Street 34	Forgetting Sarah Marshal, Daddy's Little Girls	Mr.	Romance, Romance
Robert Phil	5th Avenue	Clash of the Titans	Mr.	Action

(b) Explain architecture of parallel DBMS with the help of diagram. 10

Q.4 (a) Define minimal cover and closure for functional dependencies. .Consider the relation R(P,Q,R,X,Y,Z) and set of functional dependencies are 10
$P \rightarrow Q$, $RX \rightarrow Y$, $RX \rightarrow Z$, $P \rightarrow R$, $Q \rightarrow Y$
Obtain other functional dependencies and compute Closure of PX^+.

(b) Explain hash based indexing. Discuss the use of hash function in identifying a bucket search. 10

Q.5 (a) What is serializability? Explain conflict serializability and view serializability. 10
(b) i) What is B+ tree? Explain with the help of an example. 05
ii) Consider the following B+ tree 05



Perform following operations on B+ tree assuming maximum capacity of node as four

A. Insert 28
B. Insert 70

Q.6 (a) Define the terms fragmentation and replication in terms of where data in stored and also how the object are uniquely identified in distributed database?
(b) What is locking protocol? Describe the 2 phase locking protocol and strict two phase locking protocol.

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