

(3 Hours)

[Total Marks: 80]

- N.B.:**
- 1) Question No.1 is **compulsory**.
  - 2) Attempt any **three** from the remaining **five** questions.

Write a short note on following (any Four)

1. (a) Role of DBA (5)
- (b) Weak entity set with example (5)
- (c) Primary and secondary index (5)
- (d) Transaction state diagram (5)
- (e) Differentiate OODBMS and ORDBMS (5)
- (f) Objects, Oids and reference types (5)

2. (a) A Sai car rental service is a car rental showroom. They offer different types of car on rent as small car, SUV, MUV. Each car has max. seating available and tariff per km. A system is required to show availability of the no of cars of each type of serving the inquiry. A system should have provision for booking the car. Before booking customer need to provide personal information and driving license details. Booking typically stored as booking date, date of rent, duration and vehicle type. A new transaction record is created for each booking. (10)

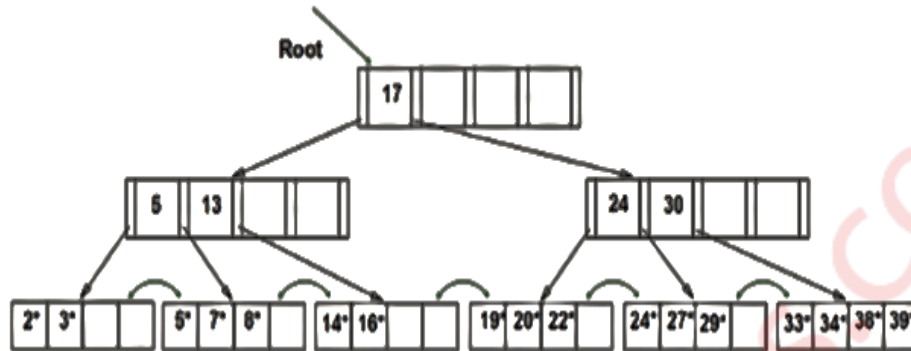
Draw an ER diagram for the case and also write the schema definition.

- (b) Explain Architecture of DBMS along with advantages. (10)
3. (a) Explain 1NF, 2NF, 3NF with the help of example. Normalize the below table till 3NF. (10)

Emp_id	Emp_name	Month	Sales	Bank_id	Bank_name
E01	David	Jan	1000	B01	SBI
E01	James	Feb	1200	B01	SBI
E02	Sam	Jan	2200	B02	UTI
E03	Lisa	Jan	1700	B02	UTI

- (b) Discuss the architecture of distributed database system in detail. (10)
4. (a) Define Minimal Cover. Consider the relation R(A,B,C,D,E) and set of functional dependencies are, F{ A->D,BC->AD,C->B,E->A,E->D}.Find minimal cover. (10)
- (b) Explain tree based indexing and hash based indexing. (10)

- 5 (a) What is B+ tree? Consider the following B+ tree; perform following operations on B+ tree assuming maximum capacity of node as four. (10)
- A. Delete 19
- B. Delete 20



- (b) Write a note on 2 phase locking protocol in detail. Explain how it is used to handle concurrency in database. (10)
- 6 (a) Explain ACID properties of transaction along with example. (10)
- (b) Explain horizontal and vertical fragmentation with example. Also specify replication types. (10)