NEIL GOGTE INSTITUTE OF TECHNOLOGY

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Answer Booklet

Name of the examination   : B.E (II / IV / VI) semester examination , sep. 2021

Internal exam   :   CIE-II

Hall ticket no.   :   2453-19-733-042

Name of the student   :   K.Rishab Reddy

Semester / Branch   :   CSE

Section   :   A

Name of the subject   :   DBMS

Date of examination   :   31/09/2021

QUESTION NO.	AWARD	
1.		
2.		
3.		
4.		
TOTAL		

Sign. Of the faculty:

Part-B

7)

INF

The objective of the INF is to divide the base data into logical units called tables. When each table has been designed, a primary key is assigned to most or all tables.

Examples:

EMPLOYEE - TBL

- emp - id
- last - name
- first - name
- middle - name
- address
- city
- state
- zip
- phone

COMPANY - DATABASE

emp id	cust - id
last - name	cust - name
first - name	cust_address
middle - name	cust - city
address	cust - state
city	cust_zip
state	cust - zip
zip	cust - zip
phone	cost_phone

CUSTOMER- TBL

- cust id
- cost_name
- cust_address
- cust-city
- cust_state
- cost - zip
- cust_zip
- cost phone
- qty

position	pager	ord-num	
			PRODUCTS - TBL
pag-rate	data-hire	proof-id	proof-id
bonus	bonus	cost	cost
data-last-raised	date_last-raise		cost

You can see that to achieve the first normal form, data had to be broken into logical units of related information, each having a primary key & ensuring that there are no repeated group in any of the tables.

2NF

The objective of second normal form is table data is only partly dependent on the primary key and enter that data into another table.

Example: Suppose a school wants to store the data of teachers and the subjects they teach.

teacher-id	Subject	teacher-age
111	Maths	38
111	Physics	38
222	Biology	38
333	physics	40
333	chemistly	40

Candidates keys : { teacher-id, Subject }

3NF : its objective is to remove data in a table that is not dependent on the primary Ke
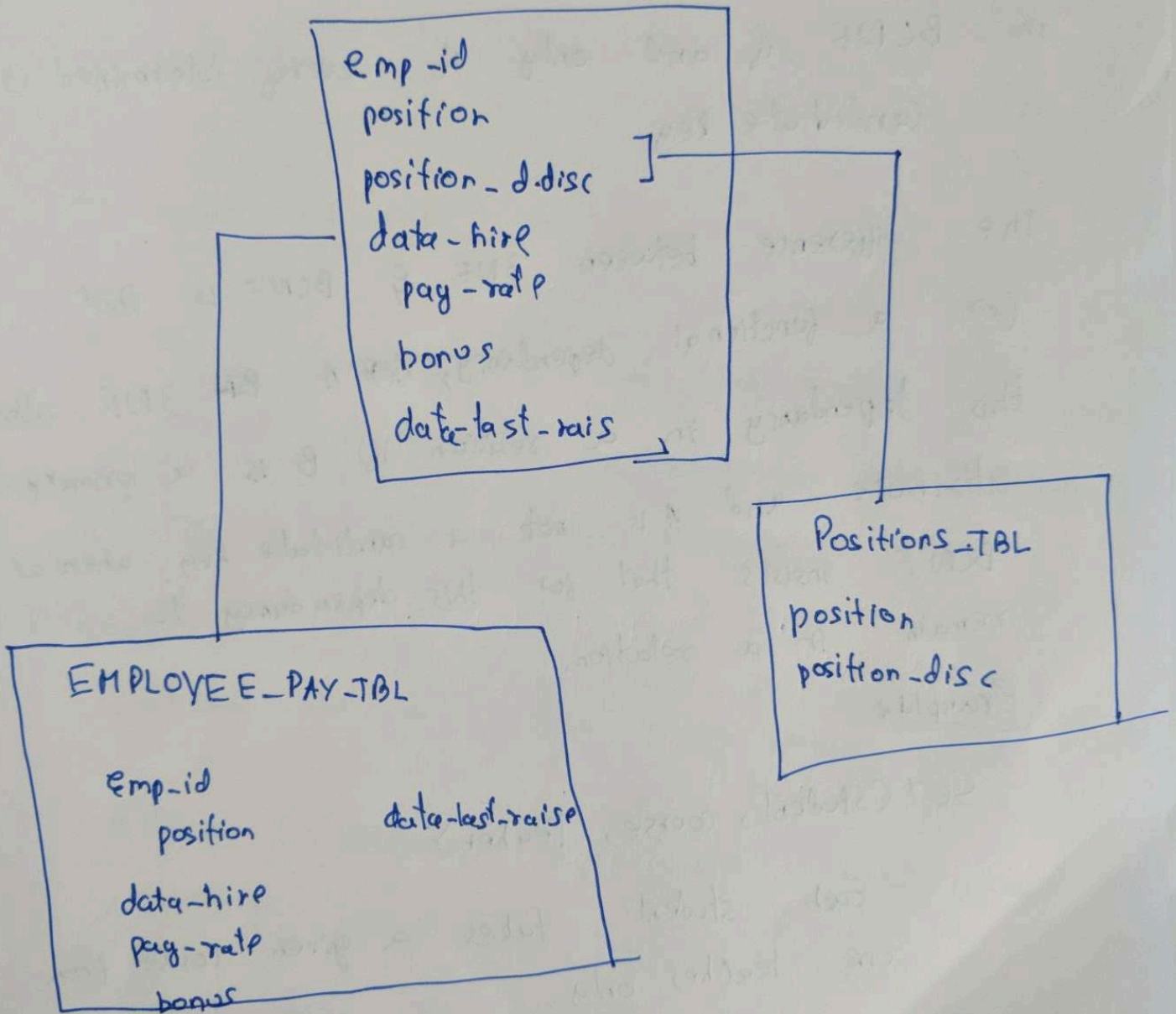
Examples

EMPLOYEE - PAY -TBL

emp -id
position
position _ d.disc
data - hire
pay - rate
bonus
data-last - rais

Positions_TBL

position
position -disc

EMPLOYEE_PAY_TBL

emp-id
position   data-last-raise

data-hire
pay-rate
bonus

BCNF

Boyce - codd normal for . is A relation is in BCNF, if and only if, every determined is a candidate key.

The difference between 3NF & BCNF is that for a functional dependency, A→·A in 3Nf allow this dependancy in a relation if B is a primary-key attribute and A is not a candidate key, where as BCNF insists that for this dependancy to remain in a relation.

Examplde

SCT (Student, course, Teaher)

- Each student takes a given course from one teacher only.

- Each teacher teaches one course only

(S, C) Primary key, SC ⇌ T

SCT relation is 3N
But also T → C

Decomposition: ST & TC

has a lossless join, but the functional. dependency SC → T is not preserved in this case.

aa)

log-Based recovery:

→ log is a sequence of log records, & maintains a record of update activities on the database. A log is kept on stable storage.

→ when transaction T_i ; starts, it registers itself by writing a < T_i start > log record.

→ Before T_i executes write (x), a log record < T_i, x, V_i, V_2 > is written, where V_i is the value V_1 before the write, & ~~will have the value V_2 after the write.~~ V_2 is the value to be written to x.

· log record notes that Ti has performed

a write on data item x_j, x_j had value V_1 before the write, and will have value V_2 after the write.

→ when Ti finishes it last statement, the log record $< Ti$ comit $>$ is written

→ we assume for now that log records are written directly to stable storage.

→ Two approaches using logs:

- deferred database modification
- Immediate database modification

b) Two-phase locking protocols:

→ This is protocol which ensures conflict serialisable schedules.

phase 1: Growing phase: the transaction may obtain locks and transaction may not be release locks

phas 2 : Shrinking phase : The transaction may release locks & transaction my not obtain locks.

This protocol assures serializability. It can be proved that the transactions can be serialized in the order of their lock points.

Part-A

1. Armstrong's Axioms are

i) Axiom of Reflectivity

2) Axiom of Augmentation

3) Axiom of transitivity

2) ACID (Atomicity, Consistency, Isolation, Durability) is a set of properties of database transactions intended to gauranteo validity even in the ever of errors, power faliores.

5) Conflict Serializable: A schedule is called conflict serializable if it can be transformed into a serial schedule by swapping no-conflicting operations. ~~conflicting~~

Conflicting operations: Two operations are said to be conflicting if all conditions satisfy: They belong to different transactions. They operate on the same data item.

6) The buffer manager is the software layer that is responsible for bringing pages from physical disk to main memory by dividing the main memory int. a collection of pages, which we called as buffer pool. The main memory pages in the buffer pool are called frames.

4)

Primary Index	Secondary Index
i) Index on a set of fields that includes the unique primary key and is gauranteed not to contain ~~deg~~ duplicates	i) Index that is not a primary index and many have duplicates.

ii) Requires the row in data blocks to be ordered on index key

Does not have an impact on how they rows are actually organised in datablocks

Ŋa

3)

Static hashing	Dynamic hashing
i) A hashing technique that allows users to perform lookpps or a finalized dictionary set	i) A hashing technique in which data buckets are added & removed dynamically and on demand.
ii) Resultant data bucket addresses is always the same.	ii) Data buckets change depending on the records.
iii) less efficient	iii) more efficient.