ADICHUNCHANAGIRI INSTITUTE OF TECHNOLOGY
CHIKKAMAGALURU
DEPARTMENT OF CS&E (DATA SCIENCE)

Subject: Database Management Systems
IA-01
Course: B. E

Time: 9:30-10:30 AM
Max Marks: **25**

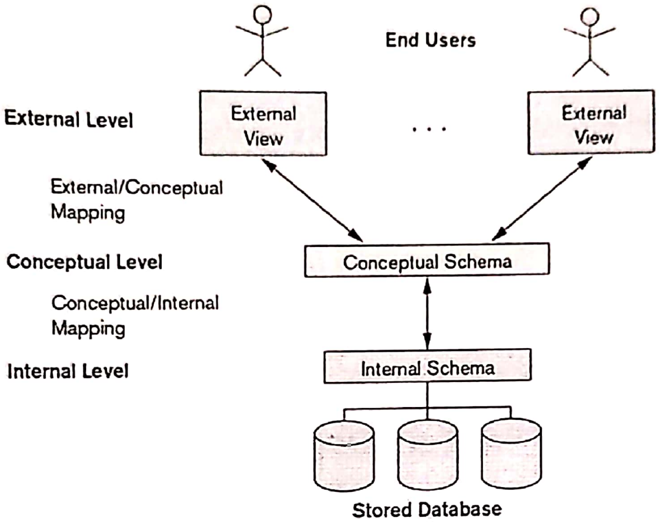
Subject code: **BCS403**
Date: **25/06/2024**

Answer any Five Full Questions

Q.No	Question	BL Level	CO	Marks
1.	What is a Database? Explain the three schema architecture with neat diagram.	L1,L2	CO1	5M
	OR			
2.	What are the advantages of using DBMS approach? Explain	L1,L2	CO1	5M
3.	Define the following terms : i) Key ii) Super key iii) Candidate key iv) Primary key v) Foreign key	L2	CO2	5M
	OR			
4.	Define the following with an example: (i) Weak entity type (ii) participation constraint (iii)cardinality ratio (iv) recursive relationship (v) specialization	L2	CO2	5M
5.	Explain JOIN operation with an example (a.Theta join, b. Equijoin, c. Natural join, d.Outer join (left outer join and right outer join))	L2	CO2	5M
	OR			
6.	Considering the following schema and also write the schema diagram Sailors(sid, sname , rating , age) Boats (bid, bname , color) Reserves (sid , bid , day) Write a relational algebra queries for the following : 1. Find names of sailors who have reserved boat # 103. 2. Find names of sailors who have reserved a red boat. 3. Find names of sailors who have reserved a red or green boat. 4. Find names of sailors who have reserved all boats. 5. Retrieve the number of boats which are not reserved	L2	CO2	5M
7.	Design a ER diagram for AIRLINES database schema with at least five entities. Also specify primary key and structural constraints (cardinality and participation ratios). Assume meaningful attributes and relationship types.	L3	CO1	5M
	OR			
8.	Design an ER diagram for banking database schema with at least five entities. Also specify primary key and structural constraints (cardinality and participation ratios). Assume meaningful attributes and relationship types.	L3	CO1	5M
9.	Explain the relational algebra operation for set theory with examples.	L2	CO2	5M
	OR			
10.	Explain the ER to relational mapping algorithm with suitable example for each step.	L2	CO2	5M

DEPARTMENT OF CS&E (DATA SCIENCE)
ADICHUNCHANAGIRI INSTITUTE OF TECHNOLOGY CHIKKAMAGALURU

Subject: Database Management Systems (BCS403)
IA Test – I Scheme and solution

Question No	Solutions	Marks
1	What is a Database? Explain the three schema architecture with neat diagram. A **database** is a collection of related data.  End Users External Level External View . . . External View External/Conceptual Mapping Conceptual Level Conceptual Schema Conceptual/Internal Mapping Internal Level Internal Schema Stored Database Schemas can be defined at the following three levels: 1. The **internal level** has an **internal schema** 2. The **conceptual level** has a **conceptual schema** 3. The **external or view level** includes a number of **external schemas** or user views Explain each levels	1M 2M 3M Total= 5M
2	What are the advantages of using DBMS approach? Explain Advantages of Using the DBMS Approach 1. Controlling Redundancy 2. Restricting Unauthorized Access 3. Providing Persistent Storage for Program Objects 4. Providing Storage Structures and Search Techniques for Efficient Query Processing 5. Providing Backup and Recovery 6. Providing Multiple User Interfaces 7. Representing Complex Relationships Among Data 8. Enforcing Integrity Constraints 9. Permitting Inferencing and Actions Via Rules Explain any 5 advantages	1M 4M Total= 5M
3	Define the following terms : i) Key ii) Super key iii) Candidate key iv) Primary key v) Foreign key	

	i) Key: A key is an attribute or a set of attribute in a relation that uniquely identifies a tuple in a relation. ii) Super key: A super key is an attribute or any set of attributes that uniquely identifies a row in a relation. iii) Candidate key: A candidate key is an attribute or set of attribute that uniquely identifies a row in a relation. In other words minimal super key is called candidate key. iv) Primary key: A primary key is a candidate key which can uniquely identify a record or tuple. Each table can have only one primary key. The primary key should be selected in the manner such that it is unique and not null. . v) Foreign key: Foreign key is a referential key which must be a primary key of another table. This way we can link two tables for retrieving the data jointly. we only insert those values which are present in the base table. If we delete the base table automatically the foreign key and primary key relationship is broken. Explain with an example	5M Total= 5M
4	Define the following with an example: (i) Weak entity type (ii) participation constraint (iii)cardinality ratio (iv) recursive relationship (v) specialization **1.Weak entity type** A weak entity type is an entity that cannot be uniquely identified by its own attributes alone; it depends on the existence of another entity, called the owner or identifying entity. Example: In a database of students and their courses, a "Section" entity might be weak because it depends on both a "Course" entity and a "Semester" entity to uniquely identify it. **2.participation constraint** □ Participation constraints specify whether the existence of an entity depends on its being related to another entity via a relationship set. □ Types: **Total Participation**: Every entity in the entity set must participate in at least one relationship in the relationship set. **Partial Participation**: Some entities may not participate in any relationship in the relationship set. Example: In a database of employees and departments, if every employee must belong to exactly one department, there is total participation of employees in the "belongs-to" relationship with departments. **3.cardinality ratio** The cardinality ratio describes the number of instances of one entity that can or must be associated with each instance of another entity in a relationship Types: **One-to-One (1:1)**: Each instance in the first entity is associated with exactly one instance in the second entity, and vice versa. **One-to-Many (1:N)**: Each instance in the first entity can be associated with many instances in the second entity, but each instance in the second entity is associated with at most one instance in the first entity. **Many-to-One (M:1)**: Each instance in the first entity is associated with at most one instance in the second entity, but each instance in the second entity can be associated with many instances in the first entity.	5M

	Many-to-Many (M:N): Each instance in the first entity can be associated with many instances in the second entity, and each instance in the second entity can be associated with many instances in the first entity. Example: In a database modeling students and courses, a student can enroll in many courses (1), and a course can have many students enrolled (M). **4.recursive relationship** A recursive relationship occurs when an entity of a given entity type participates more than once in a relationship type, but in different roles. Example: In a database of employees where an employee can manage other employees (manager-subordinate relationship), the "Employee" entity participates twice in the "manages" relationship: once as a manager and once as a subordinate. **5.Specialization** Specialization is the process of defining subgroups of entities from a single entity based on their characteristicsTypes: **Attribute-based**: Entities are grouped based on the values of a single attribute or a small set of attributes. **Relationship-based**: Entities are grouped based on relationships with other entities. Example: In a database of vehicles, a "Car" entity can be specialized into "Sedan," "SUV," and "Convertible" entities based on the value of the "Body Type" attribute.	Total= 5M
5	Explain JOIN operation with an example (a.Theta join, b. Equijoin, c. Natural join, d.Outer join (left outer join and right outer join)) **a.Theta join** A general join condition is of the form <condition>AND<condition> AND … AND<condition> where each <condition> is of the form Ai θ Bj , Ai is an attribute of R, Bj is an attribute of S, Ai and Bj have the same domain, and θ (theta) is one of the comparison operators {=, <,>,< , ≥, ≠}. A JOIN operation with such a general join condition is called a THETA JOIN. **b. Equi join** The most common use of JOIN involves join conditions with equality comparisons only. Such a JOIN, where the only comparison operator used is =, is called an EQUIJOIN. **c. Natural join** The join condition for NATURAL JOIN is constructed by equating each pair of join attributes that have the same name in the two relations and combining these conditions with AND. A single JOIN operation is used to combine data from two relations so that related information can be presented in a single table. These operations are also known as inner joins. A more general, but nonstandard definition for NATURAL JOIN is Q ← R *(list1),(list2)S In this case,<list1> specifies a list of i attributes from R, and <list2>specifies a list of i attributes from S. **d.Outer join (left outer join and right outer join)** left outer join outer join the resulting relation consists of all tuples of the left relations and the tuples of right relation which satisfy the condition.	5x1=5 M

If we join the relation student with hostel through left outer join then the result will be as follows:

Student ⟕ Hostel
Student.Name = Hostel.Name

right outer join

outer join the resulting relation consists of all tuples of the right relations and the tuples of left relation which satisfy the condition.

If we join the relation student with hostel through left outer join then the result will be as follows:

Student ⟖ Hostel
Student.Name = Hostel.Name

Total= 5M

6 Considering the following schema and also write the schema diagram

Sailors(sid, sname , rating , age)

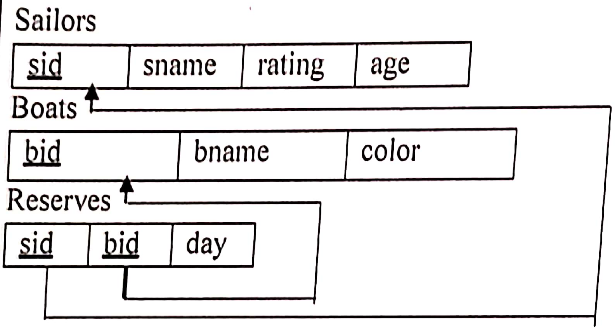
Boats (bid, bname , color)

Reserves (sid , bid , day)

Write a relational algebra queries for the following :

1. Find names of sailors who have reserved boat # 103.
2. Find names of sailors who have reserved a red boat.
3. Find names of sailors who have reserved a red or green boat.
4. Find names of sailors who have reserved all boats.
5. Retrieve the number of boats which are not reserved.

1M



Sailors

<u>sid</u>	sname	rating	age

Boats

<u>bid</u>	bname	color

Reserves

<u>sid</u>	<u>bid</u>	day

1. Find names of sailors who have reserved boat # 103.

$$\pi_{sname}(\sigma_{bid=103}(Reserves \bowtie Sailors))$$

2. Find names of sailors who have reserved a red boat.

$$\pi_{sname}((\sigma_{color='red'}(Boats) \bowtie Reserves) \bowtie Sailors)$$

4M

3. Find names of sailors who have reserved a red or green boat.

$$\pi_{sname}((\sigma_{color='red' \vee color='green'}(Boats) \bowtie Reserves) \bowtie Sailors)$$

4. Find names of sailors who have reserved all boats.

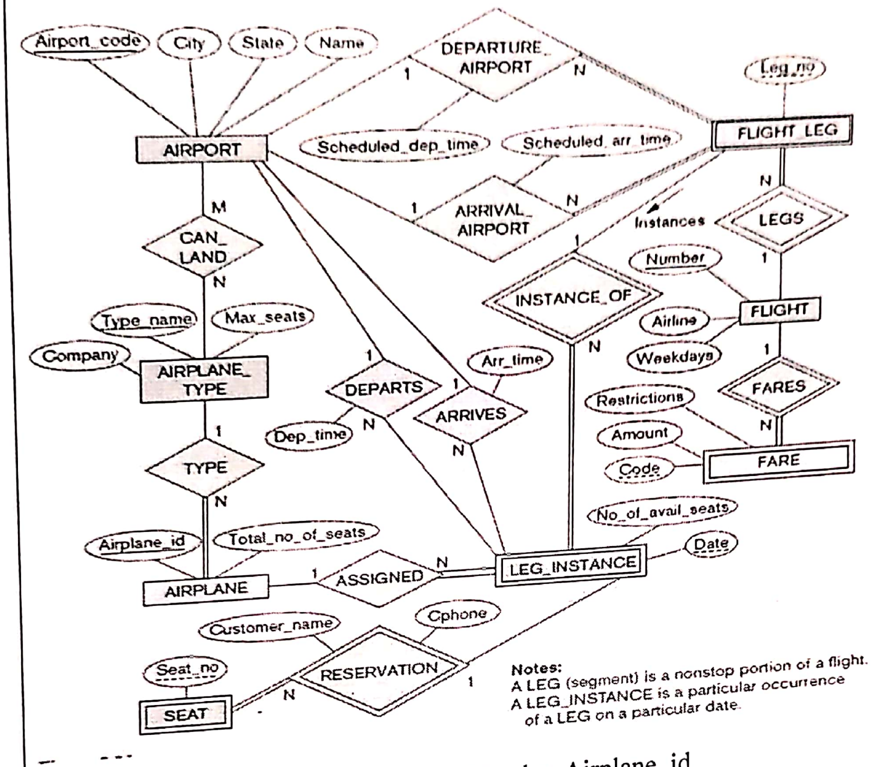
$$\pi_{sname}(Sailors) - \pi_{sname}((Boats \bowtie Reserves) \div Boats)$$

5. Retrieve the number of boats which are not reserved.
COUNT(Boats -π_{bid}(Reserves))

Total= 5M

7

Design a ER diagram for AIRLINES database schema with at least five entities. Also specify primary key and structural constraints (cardinality and participation ratios). Assume meaningful attributes and relationship types.



Notes:
A LEG (segment) is a nonstop portion of a flight.
A LEG_INSTANCE is a particular occurrence of a LEG on a particular date.

3M

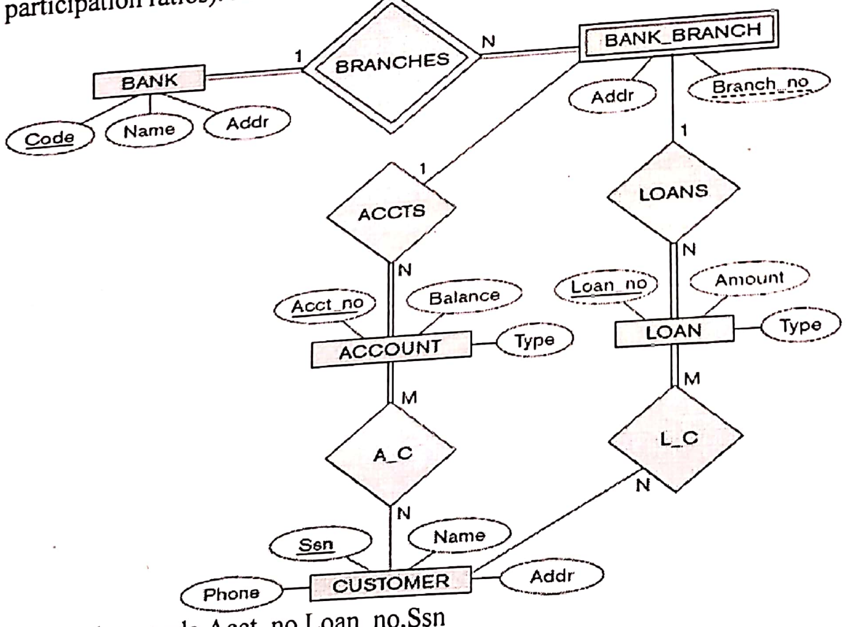
2M

Total= 5M

Primary key: Airport_code,Type_name,Number,Airplane_id
Mention all structural constraints and explain

8

Design an ER diagram for banking database schema with at least five entities. Also specify primary key and structural constraints (cardinality and participation ratios). Assume meaningful attributes and relationship types.



3M

2M

Total= 5M

Primary key: code,Acct_no,Loan_no,Ssn
Mention all structural constraints and explain

9 Explain the relational algebra operation for set theory with examples.

Relational operation

a) Selection

b) Projection

c) Join

d) Division.

Select Operation

Relational Operations

□ The select operation is used to select some specific records from the database based on some criteria.

□ This is a unary operation mathematically denoted as σ

Syntax:

σ <Selection condition> (Relation)

Comparison operators in the set { ≤, ≥, ≠, =, <, <} apply to the attributes whose domains **are** ***ordered value*** **like integer.**

Explain with an example

σ AGE <=30 (PERSON)

PROJECT Operation

The project operation is used to select the records with specified attributes while discarding the others based on some specific criteria.

This is denoted as Π.

Π List of attribute for project (Relation)

Example :

Consider the relation PERSON. If you want to display only the names of persons then the project operation will be used as follows:

Π Name (PERSON)

Selection+ Projection

Πsname(σsaddress=" Bhopal" (student));

JOIN:-

The join operator joins two or more relations to form another relation.

The join operator joints two relations on the basis of some comparison operator in meaningful way.

Syntax:- R1 R2 x Θy

Where R1, R2→ Two relations X → Attributes of R1 Y → Attributes of R2 →join operator Θ → Comparison operator

The DIVISION operation:

To perform the division operation R1 ÷ R2, R2 should be a proper subset of R1.

If R(x)=R1(z) ÷ R2(y)

The relation R(x) is having all the tuples t(x) in R1(z) that appears in R1 in combination with every tuple from R2(y).

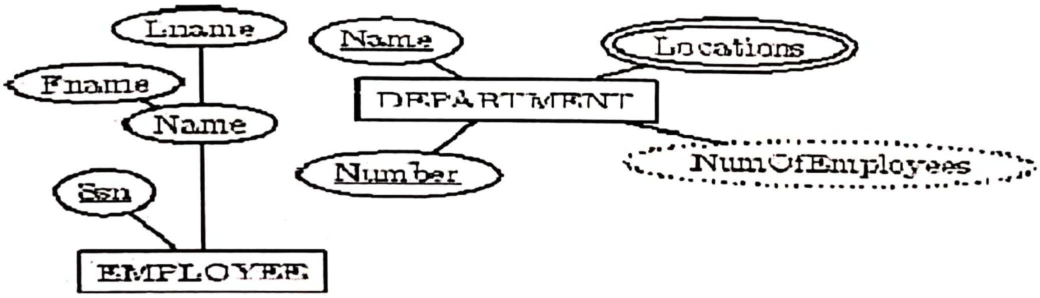
Where Z= X U Y

Total= 5M

10 Explain the ER to relational mapping algorithm with suitable example for each step.

Relational Database Design using ER-to-Relational mapping.

Step 1: For each **regular (strong) entity type** E in the ER schema,



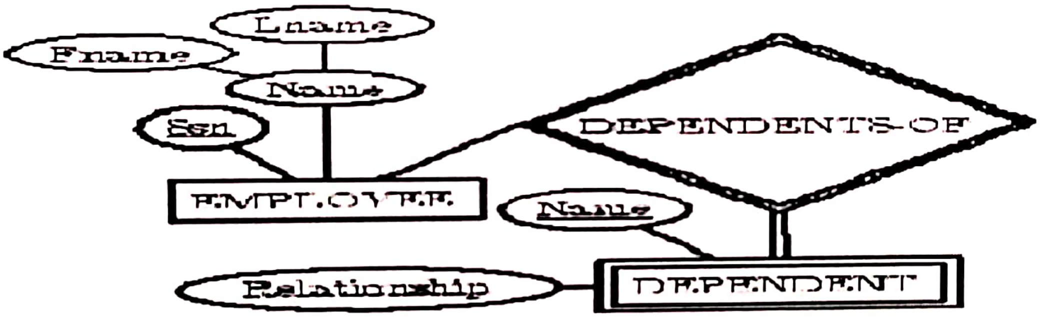
EMPLOYEE

SSN	Lname	Fname

DEPARTMENT

NUMBER	NAME

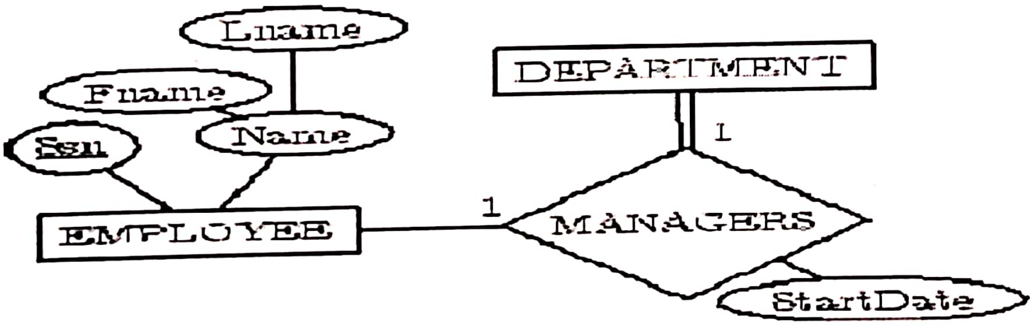
Step 2: For each **weak entity type**



DEPENDENT

EMPL-SSN	NAME	Relationship

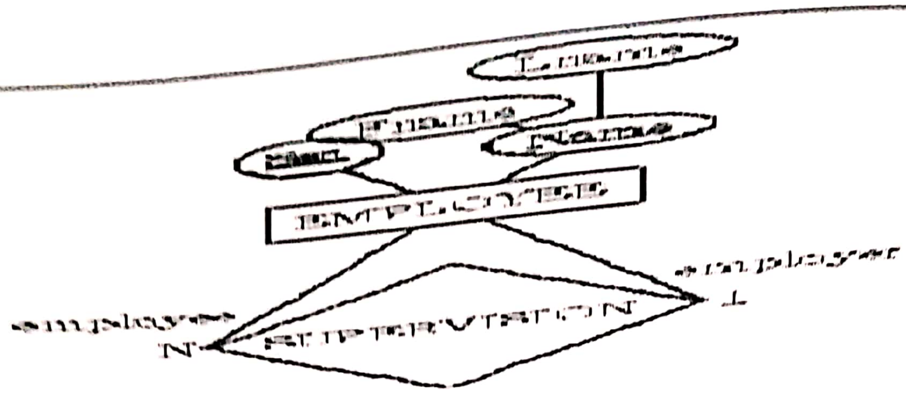
Step 3: For each **binary 1:1 relationship type**



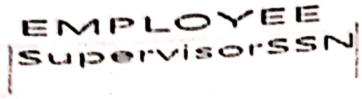
DEPARTMENT

MANAGER-SSN	StartDate

Step 4: For each regular **binary 1:N relationship type**

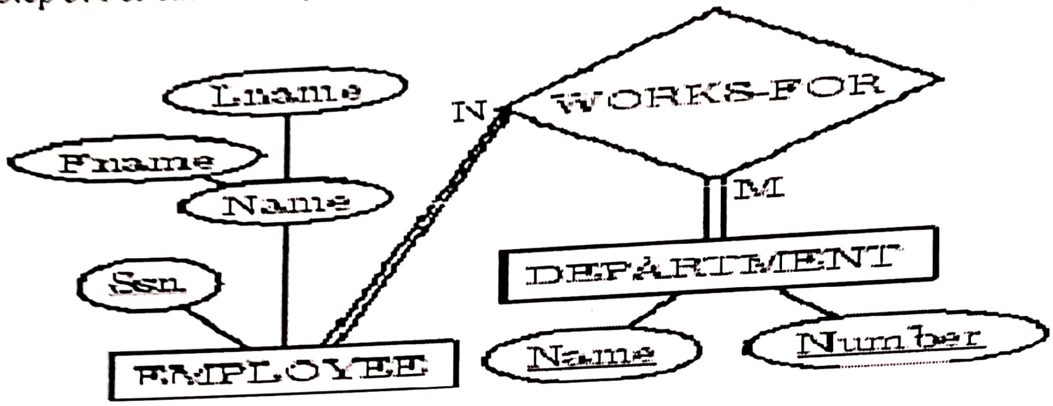


EMPLOYEE

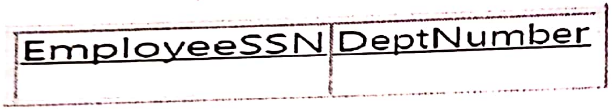


SupervisorSSN

Step 5: For each binary **M:N relationship type**

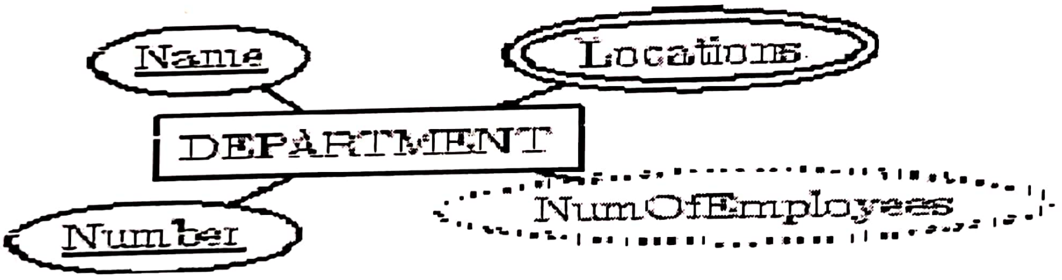


WORKS-FOR

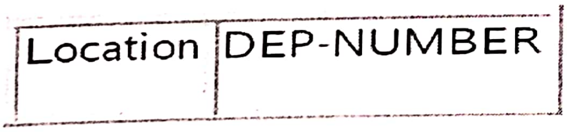


EmployeeSSN	DeptNumber

Step 6: For each **multi-valued attribute**



DEP-LOCATION



Location	DEP-NUMBER

Step 7: For each **n-ary relationship type**

Total= 5M

57

AIT /ACD/................/R-02

UNIVERSITY SEAT NO 4 A I 2 2 C D 0 6 0

|| JAI SRI GURUDEV ||

Visvesvaraya Technological University, Belagavi.

ಆದಿಚುಂಚನಗಿರಿ ತಾಂತ್ರಿಕ ಮಹಾವಿದ್ಯಾಲಯ, ಚಿಕ್ಕಮಗಳೂರು

ADICHUNCHANAGIRI INSTITUTE OF TECHNOLOGY

CHIKKAMAGALURU - 577 102.

EXCELLENCE IN EDUCATION 43 YEARS

BLUE BOOK

YEAR 202 - 202

Name : Varshini kakade S

Branch : Data Science Sem : .... Section : ....

Subject : Data Base Management System

TEST	DATE	Marks for Each Question										Max. Marks	Max. Obtained	Staff Initial	Student Signature
		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10				
I	25/06/25	5		5		4			3	5		25	22		
II	/ /2	5			5		5		5	5		25	25		
III	/ /2											15	14		
IV	/ /2														
Assignment (2)												10	10		
Lab												25	25		
TOTAL												50	49		

T L
24+25

Final CIE Marks $\frac{49}{50}$

Final CIE Marks (in words) Fourty Nine Only

No. of Corrections [if any] : ....

Signature of the Staff Incharge

HOD Signature

ಆದಿಚುಂಚನಗಿರಿ ತಾಂತ್ರಿಕ ಮಹಾವಿದ್ಯಾಲಯ ಸಹಕಾರ ಸಂಘ ನಿಯಮಿತ, ಚಿಕ್ಕಮಗಳೂರು - 577102.

A.I.T. CO-OPERATIVE SOCIETY Ltd., CHIKKAMAGALURU - 577 102.

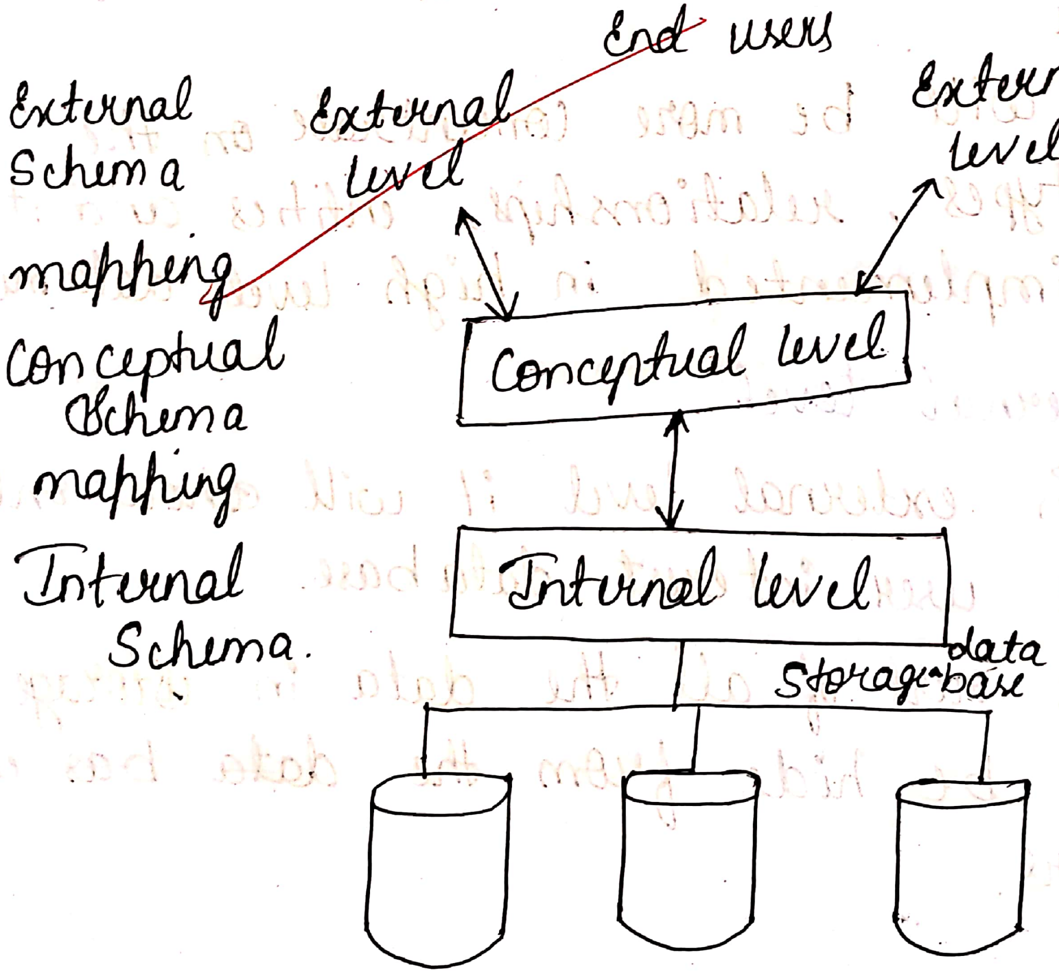
Database Management Systems.

1. Database

Database is a collection of a required data.

The three schema architecture's main goal is to separate the user applications from the storage data base.

Three Schema architecture.



1. Internal Schema

* It will describes the physical Storage Structure of the database.
* It will have the path to access the data from the Storage database and. it is having a data-model.
* Internal level have internal Schema

2. Conceptual level

* Conceptual level have conceptual Schema.
* It will describes the whole database Community unit.
* It will hide the physical Storage data-base.
* It will be more concentrate on the datatypes, relationships, entities and it is implemented in high level data model

External level

* In external level it will show only the user interest data base.
* The rest of all the data in Storage it will be hide from the data ~~bas~~ end users.

From. the figure, we came to that in three Schema architecture we have three levels that is, internal level having internal Schema and external level having external Schema and conceptual level having conceptual Schema. In that, the data can be accessed by the end users by requesting. when the end users request data. the request access will reach the internal Schema

5 and then the data is retrived from the Storage database. The transfer of data from one level to another Level is called mapping.

3. Key

* Key is the set of attributes that ca identifing the each tuple uniquely in the given relation.
* We can use tuple instead of record.
* We Can use relation as well as tal
* key is the important to find the data and to retrieve the data fast

Ex: Student_USN

Super key

* Super key is the set of attributes that can identifying the tuple uniquely int the given relation.

* It is not having any specified ~~no~~ number of ~~times~~ attributes.

Ex: Student { Mob_No, USN, Name}

* It can have any number of attributes

(iii) Candidate Key

* Candidate key is minimal of the super key attributes that can identifying the tuple in ~~so~~ a unique way in the given relation.

Ex: Student{Name, USN, Blood_group}

• Student {USN}.

) Primary key

* Primary key is the Candidate key where that the database designer selects while designing the data base.

* Primary key should contain the record. It should not be null.

* Primary key is permanent, we cannot change or update.

* It should be unique.

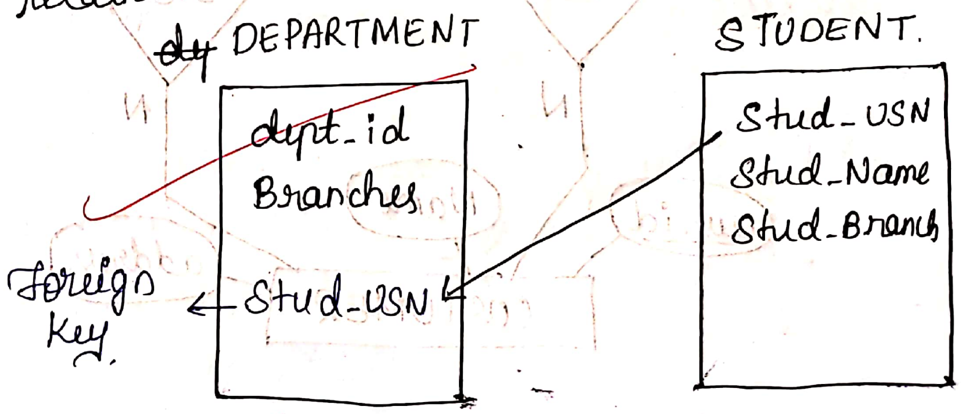
* When we inserting the record, the value should be assigned.

(v) Foreign key

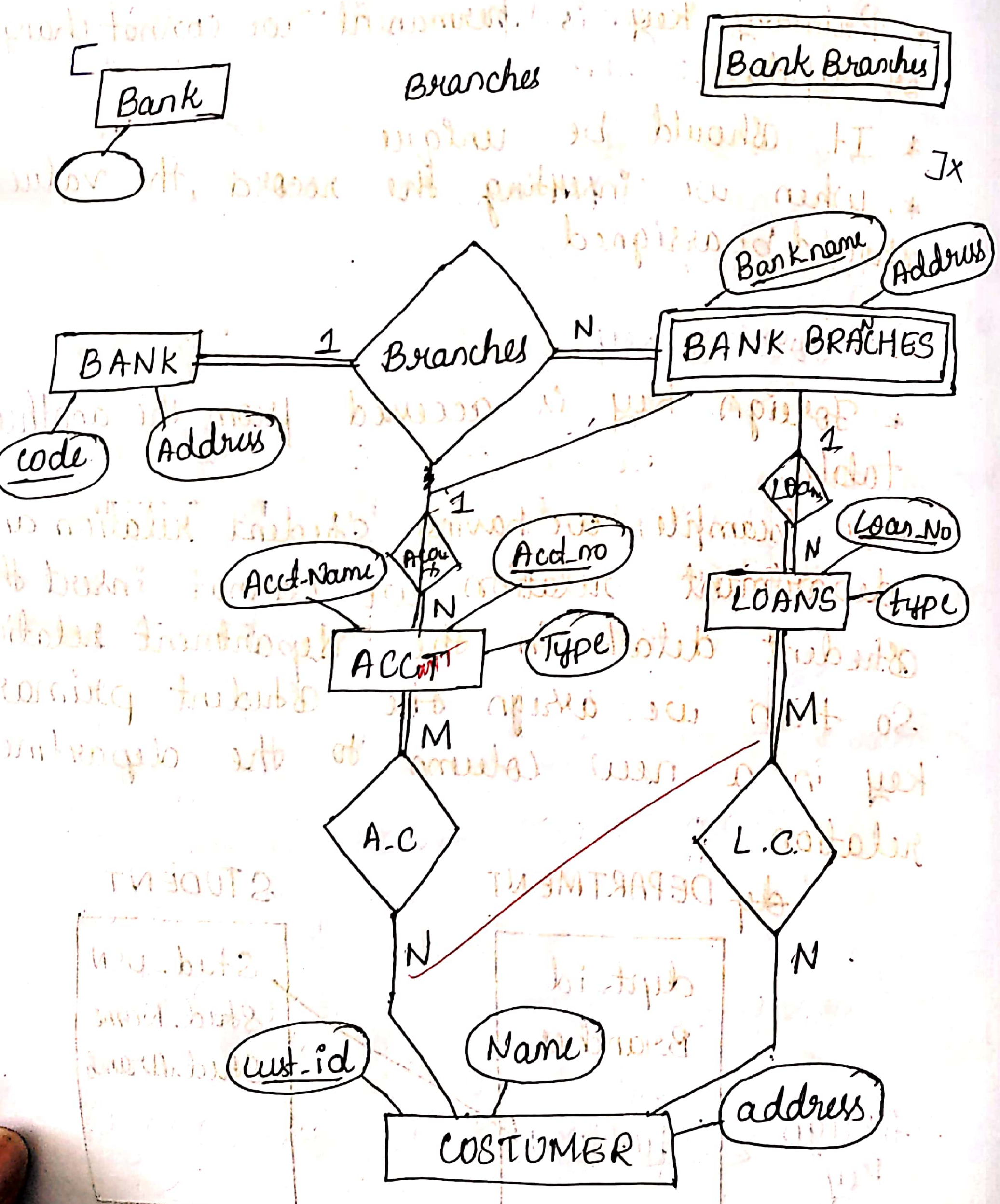
* Foreign key is accessed from the another table.

For Example, we having student relation an department relation we cannot insert th student details in the department relation. So then we assign the student primary key in a new column to the department relation.

5



8. Banking database schema.



Above figure shows the five entities, & Bank, Bank branches, Account, Loans and the customer

& Primary keys - the account no., the loan no, Customer_id, code

& Structural Constraints.

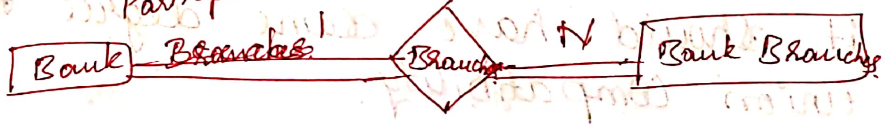
* 1: N - In 1 branch it is having N numb of branches

* M : N - M number loans can be accessed by the N number of customer.

* 1 : N - In 1 bank there are N numbe of ~~ex~~ loans.

-3-

Participation ratios ?



5. Join Operation.

Join Operation is used to get the data from the different table or to combine the two relation.

Syntax: $\bowtie_{\{condition\}}$.

For Example:

Joining the R and S relation who have same ~~ssn~~ Union compatibity

R

Name	SSN
Alica	234
Bob	532

S

Name	SSN.
John	236
~~khan~~	544

→ when we Combine the two relation it should have same degree that is union Compatibility.

a) Theta join θ

In theta Operation we have Comparison Operators like.

$\{<, >, <=, >=, =, \neq\}$

Syntax:

A is the attribute of R

B is the attribute of S.

Join Operation : $R \bowtie_{A \theta B} S$.

considering the example below.

R

A	A₁
20	30
40	50

S

B	B₁
20	30

$A > B_1$

40

when we do cartesian product of R:

we get.

A	A₁	B	B₁
20	30	20	30
40	50	20	30 ✓

By applying θ Operation.

$R \bowtie_{A > B_1} S$.

we get, only the condition satisfied the

A	A₁	B	B₁
40	50	20	30.

Like this we can do for all comparison operation.

b) Equijoin.

- the only operator is used is '='
- when the value is equal in relation tuple to another relation tuple.

Ex: Student dept.

Student	USN	Dept
Alice	432	DS
Bob	532	IS

Student	USN	Dept
John	563	DS

Now, get the student record who all are Dept DS.

- temp ← σ (Dept=DS) [Student dept].

) Natural join

- In natural join when the attributes are same it will get that record. otherwise it will rename the attribute then it will get the data.

R

Student	USN_Stu

S

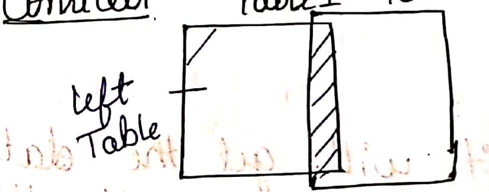
Student	USN
---	---
---	---

so it will change, rename the USN in 'S' relation to USN_Stu and then get the data.

d) Outer join [Left outer join]

It will get the record which are in left table and merged values.

Consider Table1 Table



It will get the data from left table and matches values.

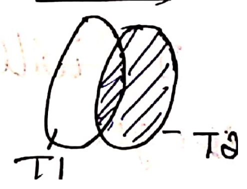
Ex: R ⟕{cond} S.

- Right outer join.

It will get the data from the right table and matched values.

Consider

Ex: R ⟖{cond} S



9. Relational algebra Operation.

- Relational algebra is procedural language
- It is used to write optimize queries

The Operations are

1. Union (R U S)
2. ~~Set~~ Intersection (R ∩ S)
3. Set difference (R - S)
4. ~~Cardinalit~~
4. Cartesian product (R X S).

1. Union.

In union, it will get the data either in R or in S or both the values.

Ex:

R

A_N	B
Var	40
Joh	50

S

A-N	B
Joh	50
Alice	30.

It will remove the duplicate values

we get

(R U S)

A_N	B
Var	40
Joh	50
Alice	30

2. Intersection.

It will get the data when the value present in both the relation.

By considering above example, we get,

(R ∩ S),

A_N	B
Joh	50

3. Set difference.

It will get the value which is in R and it will minus the value which is present in S.

we get,

R - S

A_N	B
Var	40

OR

S - R.

A_N	B
Alice	30

4. Cartesian product.

we get all the rows and the values which are present in the both the relation,

Ex:

R

A	A₁
30	40
1	2
3	4

S

B	B₁
10	20
6	7
11	12

R x S.

we get,

A	A₁	B	B₁
30	40	10	20
30	40	6	7
30	40	11	12
1	2	10	20
1	2	6	7
1	2	11	12
3	4	10	20
3	4	6	7
3	4	11	12

5

22/25

05/6/2024

IA-02.

1. Normalization.

Normalization is a Systematic approac of decomposing the tables and eliminate the data and undesireable characteristic like insertion, deletion and modification. There are do many Normal Forms ar

1. First Normal Form
2. Second Normal Form
3. Third Normal Form
4. Boyee codd Form.
5. Fourth Normal Form.
6. Fivth Normal Form

1. First Normal Form.

It is said to be first normal fo when the attribute in the table shou have only the single value. it is ne allowed the multiple value.

Ex: Taking an attributes Items, C Price, tax.

"Jai Sri Gurudev"

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ADICHUNCHANAGIRI INSTITUTE OF TECHNOLOGY

CHIKKAMAGALURU – 577102, KARNATAKA, INDIA

(Affiliated to Visvesvaraya Technological University, Belagavi)

www.aitckm.in , ds@aitckm.in

Dept. of Computer Science and Engineering (Data Science)

Second Internals Test Duty Allotment Details

	31/07/2024		01/08/2024		02/08/2024	
	9:30 to 10:30	3:30 to 4:30	9:30 to 10:30	3:30 to 4:30	9:30 to 10:30	3:30 to 4:30
Dr. Adarsh M J	*					
Pallavi C S				*		
Shalini I S		*			*	
Gagana Deepa			*		*	
Harshitha H D	*					*
Shilpa K V			*			
Maths				*		
Biology		*				
UHV						*

Signature of the Coordinator

Signature of the HOD

Dr. ADARSH M. J.
B.E., M.Tech., Ph.D
Associate Professor & Head
Dept of CS & E (Data Science)
Adichunchanagiri Institute of Techonolgy
Chikkamagaluru-577102

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Dept. of Computer Science and Engineering (Data Science)
Internal Assesment-02

SL.NO	USN	NAME	BCS401	BCS402	BCS403	BCS405A	BBOC407	BUHK408
1	4AI22CD001	ABHIONA N SHETTY						
2	4AI22CD002	AISHWARYA T K						
3	4AI22CD003	AMRUTHA B V						
4	4AI22CD004	ANANYA B K	Ananya	Ananya	Ananya	Ananya	Ananya	Ananya
5	4AI22CD005	BHAVANA H P						
6	4AI22CD006	BHAVANA K R	Bhavana	Bhavana	Bhavana	Bhavana	Bhavana	Bhavana
7	4AI22CD007	BHAVANA N	Bhavana	Bhavana	Bhavana	Bhavana	Bhavana	Bhavana
8	4AI22CD008	BHOOMIKA GOWDA H G						
9	4AI22CD009	BHUMIKA K						
10	4AI22CD010	CHAITHRA G L	Chaithra	Chaithra	Chaithra	Chaithra	Chaithra	Chaithra
11	4AI22CD011	CHANDANA C M						
12	4AI22CD012	CHANDANA M						
13	4AI22CD013	CHINMAY C S	Chinmay	Chinmay	Chinmay	Chinmay	Chinmay	Chinmay
14	4AI22CD014	DARSHAN B C		AB				
15	4AI22CD015	DARSHITH C						
16	4AI22CD016	DEEPIKA B J	Deepika	Deepika	Deepika	Deepika	Deepika	Deepika
17	4AI22CD017	DEVIKARANI S K	Devika	Devika	Devika	Devika	Devika	Devika
18	4AI22CD018	DISHA N H				Dishanh	Disha N H	
19	4AI22CD019	EKSHA D V	Eksha	Eksha	Eksha	Eksha	Eksha	Eksha
20	4AI22CD020	FATHIMA MEHEK	Mehek	Mehek	Mehek	Mehek	Mehek	Mehek
21	4AI22CD021	GANESHNAIK M		Naik M	Naik M	Naik	Naik	Naik
22	4AI22CD022	GANUGAPENTA BHAGYA SREE	Bhagya	Bhagya	Bhagya	Bhagya	Bhagya	Bhagya
23	4AI22CD023	HARINI BHANDARI						
24	4AI22CD024	HARSHA M G	AB	AB	AB	AB	AB	AB
25	4AI22CD025	HARSHITHA S T	AB	AB	AB	AB	Harshitha	Harshitha
26	4AI22CD026	HITHA B R	Hitha	Hitha	Hitha	Hitha	Hitha	Hitha
27	4AI22CD027	JNANAJYOTHI T S	Jnana	Jnana	Jnana	Jnana	Jnana	Jnana
28	4AI22CD028	K SHIVADARSHAN						
29	4AI22CD029	KRUSHITHA P R						
30	4AI22CD030	M HEMANTH KUMAR						

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Internal Assesment-02

31	4AI22CD031	M M BHAVYA						
32	4AI22CD032	MADHURA N M	Madhura	Madhura	Madhura		Madhura	Madhura
33	4AI22CD033	MANMITHA N K						
34	4AI22CD034	MEGHANA N S	Meghana	Meghana	Meghana	Meghana	Meghana	Meghana
35	4AI22CD036	MOHAMMED SHAKIR						
36	4AI22CD037	NIDHI H BARAKER	Nidhi	Nidhi	Nidhi	Nidhi	Nidhi	
37	4AI22CD038	PALLAVI K M	Pallavi	Pallavi	Pallavi	Pallavi	Pallavi	Pallavi
38	4AI22CD040	PRATHIBHA B M	prathibha	prathibha	prathibha B M	prathibha	prathibha B M	prathibha B M
39	4AI22CD041	RAGHAV NAYAK	Raghav	Raghav	Raghav	Raghav	Raghav	Raghav
40	4AI22CD042	RAO SIDDHARTH SHANKAR						
41	4AI22CD043	RISHITHA N						
42	4AI22CD045	SAMRUDHI T Y	Samrudhi	Samrudhi	Samrudhi	Samrudhi	Samrudhi	Samrudhi
43	4AI22CD046	SANKALP S	Sankalp	Sankalp	Sankalp	Sankalp S	Sankalp S	Sankalp S
44	4AI22CD047	SHALINI L S	Shalini	Shalini	Shalini	Shalini	Shalini	Shalini
45	4AI22CD048	SHOURYA K G						
46	4AI22CD049	SHREYA M S	Shreya	Shreya			Shreya	Shreya
47	4AI22CD050	SHWETHA K M						
48	4AI22CD051	SOHAN ARYA N	Sohan Arya	Sohan Arya	Sohan Arya	Sohan Arya	Sohan Arya	Sohan Arya
49	4AI22CD052	SOUKHYA K J						
50	4AI22CD053	SPANDANA H G	Spandana			Spandana	Spandana	Spandana
51	4AI22CD054	SUHAINA G	Suhaina	Suhaina	Suhaina	Suhaina	Suhaina	Suhaina
52	4AI22CD055	SUNAINA A G	Sunaina A G	Sunaina	Sunaina A G	Sunaina A G	Sunaina A G	Sunaina A G
53	4AI22CD056	SUNIL KUMAR A B						
54	4AI22CD057	SUPREETH V S						
55	4AI22CD058	TEJASWINI M	Tejaswini	Tejaswini	Tejaswini	Tejaswini	Tejaswini	Tejaswini
56	4AI22CD059	VAISHNAVI C V		Vaishnavi	Vaishnavi			
57	4AI22CD060	VARSHINI KAKADE S						
58	4AI22CD061	VISHRUTH C S						
59	4AI22CD062	YASHAS XAVIER	Yashas	Yashas		Yashas	Yashas	Yashas
60	4AI22CD063	YASHASWINI M J	Yashaswini	Yashaswini	Yashaswini	Yashaswini	Yashaswini	
61	4AI22CD064	Shivani V	AB	AB	AB			
62	4AI23CD400	Guru Kiran K S	Guru	Guru	Guru	Guru Kiran	Guru	Guru

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Dept. of Computer Science and Engineering (Data Science)

Internal Assesment-02

	BCS401	BCS402	BCS403	BCS405A	BBOC407	BUHK408
Total Number of Students Present	59	58	59	61	61	61
No. of Absentees	03	04	03	01	01	01

Signature of the Coordinator

Signature of the HOD