A

COURSE FILE

ON

“DATABASE MANAGEMENT SYSTEM”

IV B-Tech I Semester

ELECTRONICS & COMMUNICATION ENGINEERING

CMR ENGINEERING COLLEGE

KANDLAKOYA (V), MEDCHAL (M), R.R.DIST.

A.Y.2022-23

CONTENTS OF COURSE FILE:

1. Department vision & mission
2. List of PEOs, POs, PSOs
3. List of Cos (action verbs as per blooms)
4. Syllabus copy and suggested or reference books
5. Session plan/ lesson plan
6. Session execution log
7. Lecture notes
8. Assignment Questions (samples)
9. Mid exam question papers (samples)
10. Scheme of evaluation
11. Mapping of Cos with Pos and PSOs
12. Attainment of Cos, Pos and PSOs (Excel sheet)
13. University question papers or question bank.
14. Power point presentations (PPTs)
15. Websites or URLs e- Resources

Submitted By

B.Sripriya

1. DEPARTMENT VISION & MISSION

Vision:

To produce globally competent and industry ready graduates in Computer Science & Engineering by imparting quality education with a know-how of cutting edge technology and holistic personality.

Mission:

M1. To offer high quality education in Computer Science & Engineering in order to build core competence for the students by laying solid foundation in Applied Mathematics, and program framework with a focus on concept building.

M2. The department promotes excellence in teaching, research, and collaborative activities to prepare students for professional career or higher studies.

M3. Creating intellectual environment for developing logical skills and problem solving strategies, thus to develop, able and proficient computer engineer to compete in the current global scenario.

2. LIST OF PEOs AND Pos:

2.1 Program Educational Objectives (PEO):

PEO 1: Excel in professional career or higher education by acquiring knowledge in mathematical, computing and engineering principles.

PEO 2: To provide intellectual environment for analyzing and designing computing systems for technical problems socially and economically.

PEO 3: Exhibit professionalism, multidisciplinary teamwork and adapt to current trends by engaging in lifelong learning and practice their profession with legal and ethical responsibilities.

2.1 .Program Outcomes (PO):

- **PO1**. An ability to apply knowledge of computing, mathematics, science and engineering fundamentals appropriate to the discipline.
- **PO2**. An ability to analyze a problem, and identify and formulate the computing requirements appropriate to its solution.
- **PO3.** An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs with appropriate consideration for public health and safety, cultural, societal and environmental considerations.
- **PO4**. An ability to design and conduct experiments, as well as to analyze and interpret data.
- **PO5**. An ability to use current techniques, skills, and modern tools necessary for computing practice.
- **PO6** An ability to analyze the local and global impact of computing on individuals, organizations, and society.
- **PO7.** Knowledge of contemporary issues.
- **PO8.** An understanding of professional, ethical, legal, security and social issues and responsibilities.

- **PO9.** An ability to function effectively individually and on teams, including diverse and multidisciplinary, to accomplish a common goal.
- **PO10.** An ability to communicate effectively with a range of audiences.
- **PO11.** An understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects.
- **PO12.** Recognition of the need for and an ability to engage in continuing professional development.

NBA Graduate Attributes

PO1 Engineering knowledge

PO2 Problem analysis

PO3 Design/development of solutions

PO4 Conduct investigations of complex problems

PO5 Modern tool usage

PO6 The engineer and society

PO7 Environment and sustainability

PO8 Ethics

PO9 Individual and team work

PO10 Communication

PO11 Project management and finance

PO12 Life-long learning

3. COURSE OUTCOMES:

1. Gain knowledge of fundamentals of DBMS, database design and normal forms.
2. Master the basics of SQL for retrieval and management of data.
3. Be acquainted with the basics of transaction processing and concurrency control.
4. Familiarity with database storage structures and access techniques.

4. SYLLABUS COPY (JNTUH*):*

B.Tech. IV Year I Sem. **Course Code: CS404PC**

UNIT-I

Data base System Applications, purpose of data base System – View of Data – Data Abstraction –Instances and Schemas – data Models – Database Languages – DDL – DML – database Access for applications Programs – data base Users and Administrator – Transaction Management – data Storage and querying, database architecture, database users and administrators, history of data base system.

Introduction to data base design ER diagrams – Beyond ER Design Entities, Attributes and Entity sets – Relationships and Relationship sets – Additional features of ER Model – Concept Design with the ER Model – Conceptual Design for Large enterprises, Introduction to the Relational Model – Integrity Constraint Over relations – Enforcing Integrity constraints – Querying relational data – Logical data base Design – Introduction to Views – Destroying /altering Tables and Views

UNIT-II

Relational Algebra and calculus – Selection and projection set operations – renaming – Joins – Division – Examples of Algebra overviews – Relational calculus – Tuple relational Calculus – Domain relational calculus – Expressive Power of Algebra and calculus

Form of Basic SQL Query – Examples of Basic SQL Queries – Introduction to Nested Queries – Correlated Nested Queries Set – Comparison Operators – Aggregative Operators – NULL values – Comparison using Null values – Logical connectivity's – AND, OR and NOT – Impact on SQL Constructs – Outer Joins – Disallowing NULL values – Complex Integrity Constraints in SQL Triggers and Active Data bases.

UNIT-III

Schema refinement – Problems Caused by redundancy – Decompositions – Problem related to decomposition – reasoning about FDS – FIRST, SECOND, THIRD Normal forms – BCNF – Lossless join Decomposition – Dependency preserving Decomposition – Schema refinement in Data base Design – Multi valued Dependencies – FORTH Normal Form, join dependencies, Fifth Normal form, Inclusion Dependencies.

UNIT-IV

Transaction Concept- Transaction State- Implementation of Atomicity and Durability – Concurrent – Executions – Serializability- Recoverability – Implementation of Isolation – Testing for serializability

Concurrency control-Lock Based Protocols – Timestamp Based Protocols- Validation- Based Protocols – Multiple Granularity Recovery and Atomicity – Log – Based Recovery – Recovery with Concurrent Transactions – Buffer Management – Failure with loss of nonvolatile storage-Advance Recovery systems- Remote Backup systems

UNIT-V

Transaction Concept- Transaction State- Implementation of Atomicity and Durability – Concurrent – Executions – Serializability- Recoverability – Implementation of Isolation – Testing for serializability-

Concurrency control-Lock Based Protocols – Timestamp Based Protocols- Validation- Based Protocols – Multiple Granularity.

Recovery and Atomicity – Log – Based Recovery – Recovery with Concurrent Transactions – Buffer Management – Failure with loss of nonvolatile storage-Advance Recovery systems- Remote Backup systems

5. LESSON PLAN:

S.NO	Topic (JNTU syllabus)	Sub-Topic	NO. OF LECTURES REQUIRED	Suggested Books	Method Of Teaching
UNIT - I					
1	**Introduction to data base design ER diagrams**	Data base System Applications, purpose of data base System	**L1**	T1,T2,R1,R2	**M4**
2		View of Data – Data Abstraction	**L2**	T1,T2,R1,R2	**M1**
3		Instances and Schemas	**L2**	T1,T2,R1,R2	**M1**
4		data Models – Database Languages – DDL – DML –	**L3**	T1,T2,R1,R2	**M1**
5		database Access for applications Programs	**L4**	T1,T2,R1,R2	**M1**
6		data base Users and Administrator	**L4**	T1,T2,R1,R2	**M1**
7		Transaction Management – data Storage and querying, database architecture,	**L5**	T1,T2,R1,R2	**M1**
8		database users and administrators, history of data base system	**L6**	T1,T2,R1,R2	**M1**
9		Introduction to data base design ER diagrams –	**L7**	T1,T2,R1,R2	**M1**
10		Beyond ER Design Entities, Attributes and Entity sets – Relationships and Relationship sets	**L8,L9**	T1,T2,R1,R2	**M4**
11		Additional features of ER Model – Concept Design with the	**L10**	T1,T2,R1,R2	**M4**
12		ER Model – Conceptual Design for Large enterprises	**L11**	T1,T2,R1,R2	**M4**
13		Introduction to the Relational Model – Integrity Constraint Over relations –	**L12**	T1,T2,R1,R2	**M1**
14		Enforcing Integrity constraints	**L13**	T1,T2,R1,R2	**M1**
15		Querying relational data – Logical data base Design –	**L14**	T1,T2,R1,R2	**M1**
16		Introduction to Views – Destroying /altering Tables and Views	**L15**	T1,T2,R1,R2	**M5**
UNIT – II					
17	**Introduction to**	**Introduction to Relational**	**L16**	T1,T2,R1,R2	**M1&M4**

	Relational Algebra and calculus	**Algebra and calculus**			
18		Selection and projection set operations	**L16**	T1,T2,R1,R2	**M1&M4**
19		renaming – Joins – Division –	**L16**	T1,T2,R1,R2	**M1&M4**
20		Examples of Algebra overviews	**L17,L18**	T1,T2,R1,R2	**M1&M4**
21		Relational calculus – Tuple relational Calculus	**L19**	T1,T2,R1,R2	**M1&M4**
22		Domain relational calculus	**L20**	T1,T2,R1,R2	**M1&M4**
23		Expressive Power of Algebra and calculus	**L21**	T1,T2,R1,R2	**M1&M4**
24		Form of Basic SQL Query – Examples of Basic SQL Queries –	**L22,23**	T1,T2,R1,R2	**M1&M5**
25		Introduction to Nested Queries	**L24**	T1,T2,R1,R2	**M1&M5**
26		Correlated Nested Queries	**L24**	T1,T2,R1,R2	**M1&M5**
27		Set – Comparison Operators – Aggregative Operators – NULL values	**L25**	T1,T2,R1,R2	**M1&M5**
28		Comparison using Null values	**L26**	T1,T2,R1,R2	**M1&M5**
29		Logical connectivity's – AND, OR and NOT – Impact on SQL Constructs	**L27**	T1,T2,R1,R2	**M1&M5**
30		Outer Joins Disallowing NULL values	**L28**	T1,T2,R1,R2	**M1&M5**
31		Complex Integrity Constraints in SQL Triggers and Active Data bases	**L29**	T1,T2,R1,R2	**M1&M5**
UNIT – III					
32	**Introduction to Schema refinement**	Introduction to Schema refinement,.	**L30**	T1,T2,R1,R2	**M1&M4**
33		Problems Caused by redundancy	**L31**	T1,T2,R1,R2	**M1&M4**
34		Decompositions – Problem related to decomposition	**L32**	T1,T2,R1,R2	**M1&M4**
35		reasoning about FDS	**L32**	T1,T2,R1,R2	**M1&M4**
36		FIRST, SECOND, THIRD Normal forms, BCNF	**L33-L35**	T1,T2,R1,R2	**M4&M5**
37		Lossless join Decomposition – Dependency preserving Decomposition	**L36**	T1,T2,R1,R2	**M4&M5**
38		Schema refinement in Data base Design	**L37**	T1,T2,R1,R2	**M4&M5**
39		Multi valued and Join Dependencies – FORTH and 5th Normal Form	**L38**	T1,T2,R1,R2	**M4&M5**
UNIT – IV					
40	**Introduction to Transaction Concept**	Introduction to Transaction Concept , Transaction State-Implementation of Atomicity and Durability – Concurrent	**L39**	T1,T2,R1,R2	**M1&M4**

41		Executions – Serializability-Recoverability	**L40**	T1,T2,R1,R2,	**M1&M4**
42		Implementation of Isolation – Testing for serializability	**L41**	T1,T2,R1,R2	**M1&M4**
43		Concurrency control-Lock Based Protocols	**L42**	T1,T2,R1,R2	**M4&M5**
44		Timestamp Based Protocols, Validation- Based Protocols	**L43**	T1,T2,R1,R2	**M4&M5**
45		Multiple Granularity	**L44**	T1,T2,R1,R2	**M4&M5**
46		Recovery and Atomicity, Log – Based Recovery	**L45**	T1,T2,R1,R2	**M1&M4**
47		Recovery with Concurrent Transactions	**L46**	T1,T2,R1,R2	**M1&M4**
48		Buffer Management – Failure with loss of nonvolatile storage	**L47**	T1,T2,R1,R2	**M1&M4**
49		Advance Recovery systems-Remote Backup systems	**L48**	T1,T2,R1,R2	**M1&M4**
UNIT – V					
50	**Overview of storage and indexing**	**Overview of storage and indexing**: Data on External Storage	**L49**	T1,T2,R1,R2	**M4**
51		File Organization and Indexing, Cluster Indexes, Primary and Secondary Indexes	**L50**	T1,T2,R1,R2	**M4,M5**
52		Index data Structures	**L51**	T1,T2,R1,R2	**M4&M5**
53		Hash Based Indexing	**L52**	T1,T2,R1,R2	**M4&M5**
54		Tree base Indexing – Comparison of File Organizations	**L53**	T1,T2,R1,R2	**M4&M5**
55		Indexed Sequential Access Methods (ISAM)	**L54**	T1,T2,R1,R2	**M4&M5**
56		B+ Trees: A Dynamic Index Structure	**L55**	T1,T2,R1,R2	**M4&M5**
57		**Hash based indexing**: Static Hashing, Extendable Hashing	**L56**	T1,T2,R1,R2	**M4&M5**

METHODS OF TEACHING:

M1 : Lecture Method	**M4 : Presentation /PPT**	**M7 : Assignment**
M2 : DemoMethod	**M5 : Lab/Practical**	**M8 : Industry Visit**
M3 : Guest Lecture	**M6 : Tutorial**	**M9 : Project Based**

NOTE:

1. AnySubjectinaSemesterissupposedtobecompletedin55to65periods.
2. Each Period is of 50minutes.
3. Each unit duration &completion should be mentioned in the Remarks Column.
4. ListofSuggestedbookscanbemarkedwithCodeslikeT1,T2,R1,R2etc.

INDIVIDUAL TIME TABLE (SRIPRIYA)

	9:10-10:10	10:10-11:00	11:00-11:50	11:50-12:40	12:40-1:20	1:20-2:20	2:20-3:10	3:10-4:00
Monday	DBMS-B		DBMS-D			DBMS-D		
Tuesday			DBMS-D		**L**			DBMS-B
Wednesday		DBMS-B		DBMS-B	**U**		DBMS-D	
Thursday	DBMS-B				**N**			DBMS-D
Friday	DBMS-D	DBMS-B			**C**			
Saturday					**H**			

6. Session Execution Log:

S no	Units	Scheduled started date	Completed date	Remarks
1				
2				
3				
4				
5				

7. Lecture Notes – (hand written)

8.ASSIGNMENT QUESTIONS ALONG WITH SAMPLE ASSIGNMENT SCRIPTS

DBMS ASSIGNMENT QUESTIONS MID-1

DBMS MID-1 ASSIGNMENT QUESTIONS

1. Explain about Database Architecture?
2. Define a) Entity b) Attribute c) Relationship with examples?
3. Define views? Explain how to create and destroy views? (CO2)
4. ComparebetweenSuperkey,CandidatekeyandPrimarykeywithexample.

5. Define views? Explain how to create and destroy views? (CO2)

DBMS ASSIGNMENT QUESTIONS MID-2

1. **Define** the following

   a. Super key b. Candidate key c. Composite key d. Primary key

   e. Foreign key**(CO3)**

2. **Explain** BCNF with example. **(CO3)**
3. What is transaction? **Explain** ACID properties of transaction. **(CO3)**
4. Why do we need locks? **Explain** with example. **(CO4)**

9. MID QUESTION PAPERS

CMR ENGINEERING COLLEGE

Kandlakoya (V), Medchal Road, Hyderabad – 501401

---------- **IVB.TECH. I SEM**

MID-1 **DURATION: 60min**

Subject: DBMS **Branch: ECE Marks: 10 M**

PART-A

(Answer any two questions) **[2*5=10]**

1. Explain about Database Architecture?
2. Define a) Entity b) Attribute c) Relationship with examples?
3. Explain all the commands of following with examples(CO1)

   A. DDL B. DML

4. Define views? Explain how to create and destroy views? (CO2)

SUBJECT: DATABASE MANAGEMENT SYSTEMS **Year / SEM: IV/I-Sem**

Branch: ECE **MID-II**

SET-II

NOTE: ANSWER ANY TWO OF THE FOLLOWING

5. **Define** the following

   a. Super key b. Candidate key c. Composite key d. Primary key

   e. Foreign key**(CO3)**

6. **Explain** BCNF with example. **(CO3)**
7. What is transaction? **Explain** ACID properties of transaction. **(CO3)**
8. Why do we need locks? **Explain** with example. **(CO4)**

10. Mid-1Scheme of evaluation

COURSE: **B.Tech** YEAR**: IV** SEM: **I** A-Y: **2021-22**

NAME OF SUBJECT**: DBMS** MID: **I** DATE:

Sl. No.	NO.OF QUESTIONS	MARKS	TOTAL
1	2	5	10
2	20	0.5	10

COURSE: **B.Tech** YEAR**: IV** SEM: **I** A-Y: **2021-22**

NAME OF SUBJECT: **DBMS** MID: **II** DATE:

Sl. No.	NO.OF QUESTIONS	MARKS	TOTAL
1	2	5	10
2	20	0.5	10

11.Mapping of Course Objectives, Course Outcomes with PEOs and Pos

	Program Outcome(PO):												
PEOS		1	2	3	4	5	6	7	8	9	10	11	12
	I	x	x	x	x					x			
	II	x	x	x	x	x		x				x	
	III		x	x	x	x					x		
							x		x				
								x		x			
											x		

Course Outcomes	Relationship of Course outcomes to Program Outcomes (PO AVG)													
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PS O2
CO1	2		3	2	3				2	3	3	3	3	3
CO2	3	1	2	3	3			2	2		1	1	2	2
CO3	1	1	1	2	3				1		2	1	-	-

CO4	1	2	2	2	1								1	1

12. ATTAINMENT OF CO's, PO's AND PSO's (EXCELSHEET):

Relationship of Course outcomes to Program Outcomes (PO AVG)													
PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
2		3	2	3				2	3	3	3	3	3
3	1	2	3	3			2	2		1	1	2	2
1	1	1	2	3				1		2	1	-	-
1	2	2	2	1								1	1

ASSESSMENT OF PO'S & PSO'S THROUGH THE COURSE			
PO	CO	Value	Final PO Value
PO1	CO1	2.84	2.84
PO2	CO1	2.84	2.88
	CO2	2.79	
	CO3	2.87	
	CO4	2.92	
PO3	CO1	2.84	2.88
	CO2	2.79	
	CO3	2.87	
	CO4	2.92	
PO4	CO1	2.84	2.86
	CO2	2.79	
	CO3	2.87	
	CO4	2.92	
PO5	CO2	2.73	2.73
PSO1	CO1	2.84	2.89
	CO2	2.79	
	CO4	2.92	
PSO2	CO3	2.87	2.93
	CO4	2.92	

13. University Question Papers or Question Bank (new subject no question paper)

Code No: 135CA

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, November/December - 2018 DATABASE MANAGEMENT SYSTEMS

(Common to CE, EEE, ME, ECE, EIE, MCT, CEE, MSNT)

Time: 3 hours Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

1. Define the terms: Relational Databases, Tables.[2]

b) Write down the applications of DBMS.[3]

c) Define Trigger and give an example.[2]

d) Write down the various aggregate operators of SQL.[3]

e) Mention the properties of decomposition.[2]

f) Define BCNF. Write down its basic properties.[3]

g) Define multiple granularity.[2]

h) What do you mean by 2PL?[3]

i) Differentiate Extendible vs. Linear Hashing.[2]

j) What are the advantage and disadvantages of B+ trees? [3]

PART - B

(50 Marks)

2 .a) Explain the Database system structure.

b) Explain various DDL and DML commands. [5+5]

OR

3.a) Define ER model and explain the following kinds of constraints that can be specified in the ER diagram, and give an example of each: i) key constraint ii) participation constraint.

b) How to destroy and alter tables in a DBMS? [6+4]

4. Explain about the following:

a) Domain relational calculus.

b) Specifying foreign key constraints in SQL with an example. [5+5]

OR

5. Consider the following relations Sailors (sid, sname, rating, age) Boats (bid, bname, color) Reserves (sid, bid, day)

Write the statements in Relational Algebra, Relational Calculus, Domain Relational Calculus and SQL for the following questions.

a) Find the names of sailors who have reserved a Red boat.

b) Find the names of sailors who have reserved at least one boat.

c) Find the names of sailors who have reserved both red and Green boat

d) Find the names of sailors who have reserved a Red or a White boat.

e) Find the names of sailors who have reserved all boats.

6.a) When is the decomposition of a relation schema R into two relation schemas X and Y said to be lossless-join decomposition? Why is this property so important? Give a necessary and sufficient condition to test whether a decomposition is lossless-join.

b) Explain 3NF with examples. [5+5]

OR

7. Discuss the need for schema refinement. Explain the fourth and fifth normal form and inclusion dependencies. [10]

8.a) Discuss the impact of early lock release and logical undo operations in recovery system.

b) Explain about Concurrent execution of transactions. [5+5]

OR

9. Write and explain the Time stamped and optimistic concurrency control algorithms. [10]

10. State and explain various file organisation methods. Give suitable examples to each them. [10]

OR

11.a) Discuss insert, delete, search operations on and B+ trees.

b) What are the Pros and Cons of ISAM? [5+5]

Code No: 135CA

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech II Year II Semester Examinations, December – 2019

DATABASE MANAGEMENT SYSTEMS

Time: 3 Hours Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A

(25 Marks)

Define data mining. [2]

b) Contrast procedural DML and declarative DML. [3]

c) Why is intersection a derived operation in Relational Algebra? [2]

d) What is an active database? List challenges associated with it. [3]

e) Define join dependency. [2]

f) What is meant by spurious tuples? Give example. [3]

g) Define serializability. [2]

h) What is the role of remote backup systems in database recovery? [3]

i) Define unclustered index. [2]

j) How to measure the disk access time? [3]

PART – B

(50 Marks)

2.a) Classify the data models.

b) What is the importance of integrity constraints in database? Explain with illustrations. [5+5]

OR

3. Construct an entity relationship diagram to perform conceptual database design of online e-commerce application such as Mynthra.com. [10]

4.a) Analyze the expressive power of relational algebra.

b) Compare tuple relational calculus and domain relational calculus. [5+5]

OR

5. Consider the following database schema to write queries in SQL.

Student (Snum: integer, Sname : string, major: string, level: string, age: integer) Class (Cname: string, meets_at: time, room: string, fid: integer)

Enrolled (Snum: integer, Cname: string)

Faculty (Fid: integer, Fname: string, deptid: integer)

a) List the students' numbers taught by faculty member "Mohan".

b) Find the list of faculty ids taking class in same room.

c) Find the student details of CSE major. [10]

6. What is redundancy? Explain the problems caused by redundancy with suitable example relation. [10]

OR

7.a) Howtocomputeclosureofsetoffunctionaldependency?

b) How to compute closure of set of functional dependency? Discuss fourth normal form with illustration. [5+5]

8.a) Explain ensuring atomicity and durability properties for a transaction by DBMS.

b) Explain ensuring atomicity and durability properties for a transaction by DBMS. Compile the compatibility matrix for multiple granularity schemes. [5+5]

OR

9.a) Elaborate the sequence of steps in buffer management for a transaction commit.

b) Explain timestamp based protocol for concurrency control. [5+5]

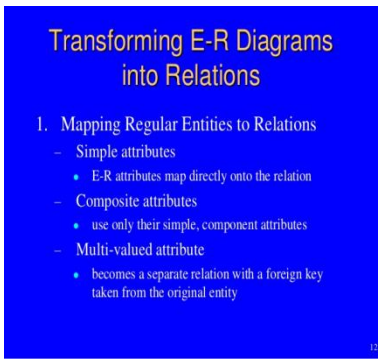
10.a) Make a comparison of sorted file organization and heap file organization.

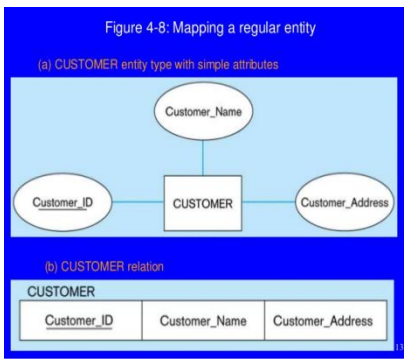
b) Distinguish between extendible and linear hashing. [5+5]

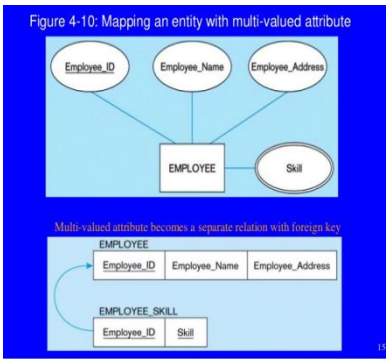
OR

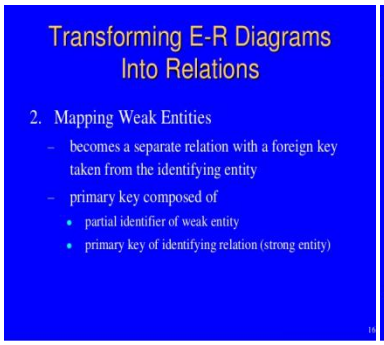
11. A student coding club file with Stu_ID as the key field includes records with the following Stu_ID values: 23, 65, 37, 60, 46, 92, 48, 71, 56, 59, 18, 21, 10, 74, 78, 15, 16, 20, 24, 28, 39, 43, 47, 50, 69, 75, 8, 49, 33, 38. Suppose that the search field values are inserted in the given order in a B+ -tree of order p=3 and pleaf =2; show how the tree will expand and construct the final tree. [10]

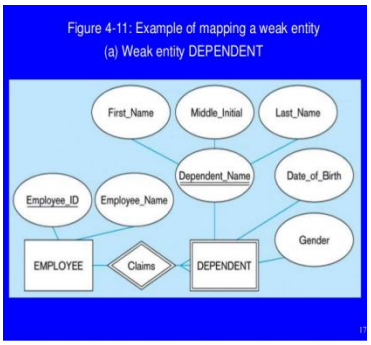
14. PPTs AND PRESENTATION:

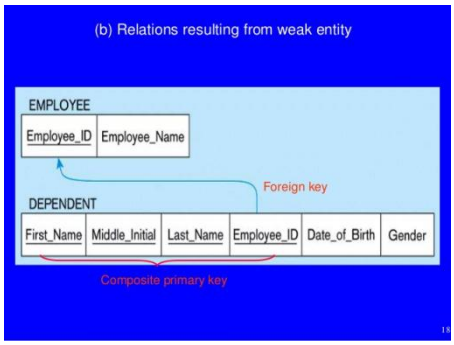


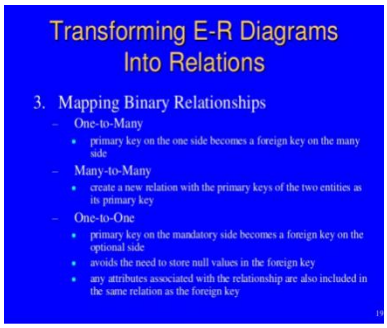


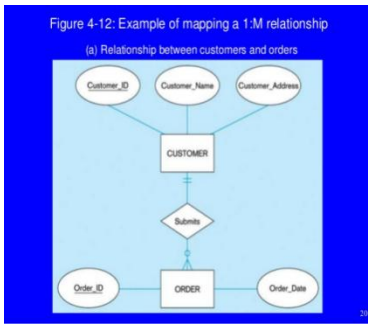


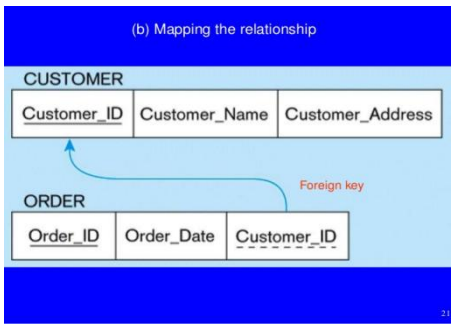


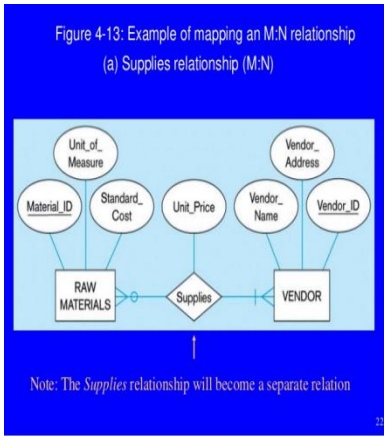


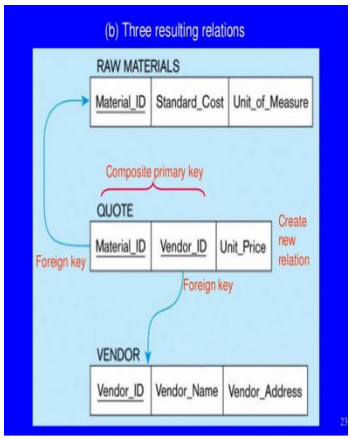


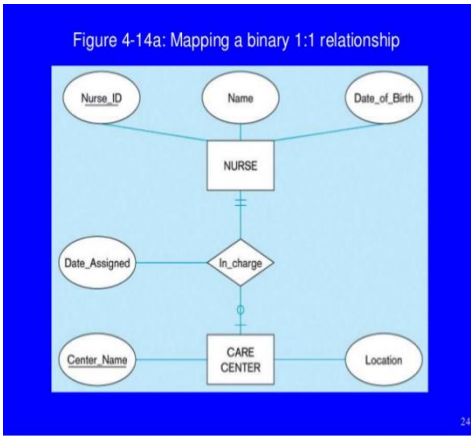












15.WEBSITES :

1. https://docs.google.com/file/d/0B00naP9qt-O5X2NRd2RQbFQxT2s/edit

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