COURSE INSTRUCTOR NAME: Mrs.S.ANITHA ACADEMIC YEAR:2023-24

SUBJECT NAME: DATABASE MANAGEMENT SYSTEM

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SEM START DATE AND END DATE: 18-9-2023 T0 20-01-24

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HOD

1. DEPARTMENT VISION & MISSION

Vision:

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

Mission:

1. To offer high-quality education in Computer Science & Engineering in order to build core competence for the graduates by laying a solid foundation in Applied Mathematics and program framework with a focus on concept building.
2. The department promotes excellence in teaching, research, and collaborative activities to prepare graduates for a professional career or higher studies.
3. Creating an intellectual environment for developing logical skills and problem-solving strategies, thus developing, an able and proficient computer engineer to compete in the current global scenario.

2. LIST OF PEOs, POs AND PSOs

2.1 Program Educational Objectives (PEO):

PEO 1: Excel in professional career and higher education by acquiring knowledge of mathematical computing and engineering principles.
PEO 2: To provide an intellectual environment for analyzing and designing computing systems for technical needs.
PEO 3: Exhibit professionalism to adapt current trends using lifelong learning with legal and ethical responsibilities.
PEO 4: To produce responsible graduates with effective communication skills and multidisciplinary practices to serve society and preserve the environment.

2.2. Program Outcomes (POs):

Engineering Graduates will be able to satisfy these NBA graduate attributes:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

2.3 Program Specific Outcomes (PSOs):

PSO1: Professional Skills and Foundations of Software development: Ability to analyze, design and develop applications by adopting the dynamic nature of Software developments.
PSO2: Applications of Computing and Research Ability: Ability to use knowledge in cutting edge technologies in identifying research gaps and to render solutions with innovative ideas.

3. COURSE OUTCOMES

CO1: Gain knowledge of fundamentals of DBMS, database design and normal forms. [Understanding]

CO2 : Master the basics of SQL for retrieval and management of data.[Applying]

CO3 : Be acquainted with the basics of transaction processing and concurrency control. [Analyzing]

CO4 : Familiarity with database storage structures and access techniques. [Evaluating]

REVISED Bloom's Taxonomy Action Verbs

Definitions	I. Remembering	II. Understanding	III. Applying	IV. Analyzing	V. Evaluating	VI. Creating
Bloom's Definition	Exhibit memory of previously learned material by recalling facts, terms, basic concepts, and answers.	Demonstrate understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions, and stating main ideas.	Solve problems to new situations by applying acquired knowledge, facts, techniques and rules in a different way.	Examine and break information into parts by identifying motives or causes. Make inferences and find evidence to support generalizations.	Present and defend opinions by making judgments about information, validity of ideas, or quality of work based on a set of criteria.	Compile information together in a different way by combining elements in a new pattern or proposing alternative solutions.
Verbs	• Choose • Define • Find • How • Label • List • Match • Name • Omit • Recall • Relate • Select • Show • Spell • Tell • What • When • Where • Which • Who • Why	• Classify • Compare • Contrast • Demonstrate • Explain • Extend • Illustrate • Infer • Interpret • Outline • Relate • Rephrase • Show • Summarize • Translate	• Apply • Build • Choose • Construct • Develop • Experiment with • Identify • Interview • Make use of • Model • Organize • Plan • Select • Solve • Utilize	• Analyze • Assume • Categorize • Classify • Compare • Conclusion • Contrast • Discover • Dissect • Distinguish • Divide • Examine • Function • Inference • Inspect • List • Motive • Relationships • Simplify • Survey • Take part in • Test for • Theme	• Agree • Appraise • Assess • Award • Choose • Compare • Conclude • Criteria • Criticize • Decide • Deduct • Defend • Determine • Disprove • Estimate • Evaluate • Explain • Importance • Influence • Interpret • Judge • Justify • Mark • Measure • Opinion • Perceive • Prioritize • Prove • Rate • Recommend • Rule on • Select • Support • Value	• Adapt • Build • Change • Choose • Combine • Compile • Compose • Construct • Create • Delete • Design • Develop • Discuss • Elaborate • Estimate • Formulate • Happen • Imagine • Improve • Invent • Make up • Maximize • Minimize • Modify • Original • Originate • Plan • Predict • Propose • Solution • Solve • Suppose • Test • Theory

Anderson, L. W., & Krathwohl, D. R. (2001). A taxonomy for learning, teaching, and assessing, Abridged Edition. Boston, MA: Allyn and Bacon.

Action Words for Bloom's Taxonomy					
Knowledge	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Create**
define	explain	solve	analyze	reframe	design
identify	describe	apply	compare	criticize	compose
describe	interpret	illustrate	classify	evaluate	create
label	paraphrase	modify	contrast	order	plan
list	summarize	use	distinguish	appraise	combine
name	classify	calculate	infer	judge	formulate
state	compare	change	separate	support	invent
match	differentiate	choose	explain	compare	hypothesize
recognize	discuss	demonstrate	select	decide	substitute
select	distinguish	discover	categorize	discriminate	write
examine	extend	experiment	connect	recommend	compile
locate	predict	relate	differentiate	summarize	construct
memorize	associate	show	discriminate	assess	develop
quote	contrast	sketch	divide	choose	generalize
recall	convert	complete	order	convince	integrate
reproduce	demonstrate	construct	point out	defend	modify
tabulate	estimate	dramatize	prioritize	estimate	organize
tell	express	interpret	subdivide	find errors	prepare
copy	identify	manipulate	survey	grade	produce
discover	indicate	paint	advertise	measure	rearrange
duplicate	infer	prepare	appraise	predict	rewrite
enumerate	relate	produce	break down	rank	role-play
listen	restate	report	calculate	score	adapt
observe	select	teach	conclude	select	anticipate
omit	translate	act	correlate	test	arrange
read	ask	administer	criticize	argue	assemble
recite	cite	articulate	deduce	conclude	choose
record	discover	chart	devise	consider	collaborate
repeat	generalize	collect	diagram	critique	collect
retell	give examples	compute	dissect	debate	devise
visualize	group	determine	estimate	distinguish	express
	illustrate	develop	evaluate	editorialize	facilitate
	judge	employ	experiment	justify	imagine
	observe	establish	focus	persuade	infer
	order	examine	illustrate	rate	intervene
	report	explain	organize	weigh	justify
	represent	interview	outline		make
	research	judge	plan		manage
	review	list	question		negotiate
	rewrite	operate	test		originate
	show	practice			propose
	trace	predict			reorganize
	transform	record			report
		schedule			revise
		simulate			schematize
		transfer			simulate
		write			solve
					speculate
					structure
					support
					test
					validate

4. SYLLABUS COPY

UNIT-I

Database System Applications: A Historical Perspective, File Systems versus a DBMS, the Data Model, Levels of Abstraction in a DBMS, Data Independence, Structure of a DBMS Introduction to Database Design: Database Design and ER Diagrams, Entities, Attributes, and Entity Sets, Relationships and Relationship Sets, Additional Features of the ER Model, Conceptual Design With the ER Model.

UNIT - II

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. Relational Algebra, Tuple relational Calculus, Domain relational calculus.

UNIT –III

SQL: QUERIES, CONSTRAINTS, TRIGGERS: form of basic SQL query, UNION, INTERSECT, and EXCEPT, Nested Queries, aggregation operators, NULL values, complex integrity constraints in SQL, triggers and active data bases. Schema Refinement: Problems caused by redundancy, decompositions, problems related to decomposition, reasoning about functional dependencies, FIRST, SECOND, THIRD normal forms, BCNF, lossless join decomposition, multi-valued dependencies, FOURTH normal form, FIFTH normal form.

UNIT - IV

Transaction Concept, Transaction State, Implementation of Atomicity and Durability, Concurrent Executions, Serializability, Recoverability, Implementation of Isolation, Testing for serializability, Lock Based Protocols, Timestamp Based Protocols, Validation- Based Protocols, Multiple Granularity, Recovery and Atomicity, Log–Based Recovery, Recovery with Concurrent Transactions.

UNIT – V

Data on External Storage, File Organization and Indexing, Cluster Indexes, Primary and Secondary Indexes, Index data Structures, Hash Based Indexing, Tree base Indexing, Comparison of File Organizations, Indexes and Performance Tuning, Intuitions for tree Indexes, Indexed Sequential Access Methods (ISAM), B+ Trees: A Dynamic Index Structure.

TEXT BOOK:

1. Data base Management Systems, Raghurama Krishnan, Johannes Gehrke, and TATA McGraw- Hill 3rd Edition2.
2. Data base System Concepts, Silberschatz, F.Korth, McGraw hill, V edition.

5.INDIVIDUAL TIME TABLE(S.ANITHA)

	I	II	III	IV		V	VI	VII
MON	IIB				L U N C H			IID
TUE	IIB DBMS LAB						IIB	IID
WED		IID		IIB		IIB DBMS LAB		
THU	IIB							IID
FRI		IID		IIB				
SAT								

6. SESSION PLAN/LESSON PLAN

S.NO	Sub-Topic	NO. OF LECTURES REQUIRED	PLANNED DATE	CONDUCTED DATE	Remarks
UNIT-I **Database System Applications & Introduction to Database Design**					
1	**Introduction to** Database System	**L1**	**19/9/2023**	**18/9/2023**	
2	A Historical Perspective and Applications	**L2**	**20/9/2023**	**18/9/2023**	
3	File Systems versus a DBMS	**L3**	**22/09/2023**	**26/9/2023**	
4	the Data Model, Levels of Abstraction in a DBMS	**L4**	**22/09/2023**	**26/9/2023**	
5	Structure of a DBMS	**L5**	**25/09/2023**	**27/9/2023**	
6	Data Independence	**L5**	**26/09/2023**	**27/9/2023**	
7	Introduction to Database Design:	**L6**	**27/09/2023**	**27/9/2023**	
8	Database Design and ER Diagrams	**L7**	**29/09/2023**	**28/9/2023**	
9	Entities, Attributes, and Entity Sets	**L8**	**29/09/2023**	**28/9/2023**	
10	Relationships and Relationship Sets	**L8**	**03/10/2023**	**30/9/2023**	
11	Additional Features of the ER Model	**L9**	**4/10/2023**	**3/10/2023**	
12	Conceptual Design With the ER Model	**L10-L12**	**6/10/2023-09/10/2023**	**4/10/2023-6/10/2023**	
UNIT-II **Introduction to Relational Model**					

13	Introduction to the Relational Model	**L13**	**10/10/2023**	**10/10/2023**	
14	Integrity constraint over relations	**L14**	**11/10/2023**	**11/10/2023**	
15	Relational Model Concepts	**L15**	**13/10/2023**	**11/10/2023**	
16	enforcing integrity constraints	**L16**	**13/10/2023**	**11/10/2023**	
17	querying relational data	**L17-L18**	**16/10/2023-17/10/2023**	**11/10/2023-13/10/2023**	
18	introduction to views destroying/altering tables and views	**L19**	**18/10/2023**	**17/10/2023**	
19	introduction Relational Algebra& operation	**L20**	**20/10/2023**	**30/10/2023**	
20	Relational Algebra queries	**L21**	**20/10/2023**	**30/10/2023**	
21	introduction Tuple relational Calculus and queries	**L22**	**25/10/2023**	**31/10/2023**	
22	introduction Domain relational calculus and queries	**L23**	**27/10/2023**	**3/11/2023**	
UNIT-III **SQL: QUERIES, CONSTRAINTS, TRIGGERS & Schema Refinement**					
23	SQL:QUERIES,CONSTRAINTS,TRIGGERS:,	**L24**	**27/10/2023**	**3/11/2023**	
24	form of basic SQL query	**L24**	**30/10/2023**	**6/11/2023**	
25	UNION, INTERSECT, and EXCEPT, Nested Queries	**L25**	**31/10/2023**	**7/11/2023-8/11/2023**	
26	aggregation operators, NULL values	**L26**	**1/11/2023**	**10/11/2023**	
27	complex integrity constraints in SQL	**L27**	**3/11/2023**	**17/11/2023**	
28	triggers and active data bases.	**L28**	**3/11/2023**	**17/11/2023**	
29	Schema Refinement: Problems caused by redundancy	**L29**	**6/11/2023**	**18/11/2023**	
30	Decompositions, problems related to decomposition	**L30**	**7/11/2023**	**20/11/2023**	
31	Reasoning about functional dependencies	**L30**	**8/11/2023**	**20/11/2023**	
32	FIRST, SECOND	**L31**	**10/11/2023**	**29/11/2023**	

33	THIRD normal forms, BCNF	**L32**	**13/11/2023**	**4/12/2023**	
34	lossless join decomposition, multi-valued dependencies	**L33**	**14/11/2023**	**5/12/2023**	
35	FOURTH normal form, FIFTH normal form	**L34**	**15/11/2023**	**5/12/2023**	
UNIT-IV Transaction Concepts					
36	Transaction Concepts	**L35**	**17/11/2023**	**6/12/2023**	
37	Transaction State, Implementation of Atomicity Durability	**L36**	**17/11/2023**	**8/12/2023**	
38	Concurrent Executions, Serializability	**L37**	**20/11/2023**	**12/12/2023**	
39	Recoverability	**L38**	**21/11/2023**	**12/12/2023**	
40	Implementation of Isolation	**L39**	**22/11/2023**	**12/12/2023**	
41	Testing for Serializability	**L39**	**24/11/2023**	**13/12/2023**	
42	Lock Based Protocols	**L40**	**24/11/2023**	**13/12/2023**	
43	Timestamp Based Protocols	**L41**	**27/11/2023**	**19/12/2023**	
44	Validation- Based Protocols	**L42**	**28/11/2023**	**19/12/2023**	
45	Multiple Granularity	**L42**	**29/11/2023**	**19/12/2023**	
46	Recovery and Atomicity	**L43**	**1/12/2023**	**20/12/2023**	
47	Log–Based Recovery	**L43**	**1/12/2023**	**22/12/2023**	
48	Recovery with Concurrent Transactions	**L44**	**4/12/2023**	**22/12/2023**	
UNIT-V Data on External Storage					
49	Data on External Storage, File Organization and Comparison of File Organizations	**L45**	**5/12/2023**	**22/12/2023**	
50	Cluster Indexes, Primary and Secondary Indexes,	**L46**	**6/12/2023**	**26/12/2023**	
51	Indexing, Index data Structures,	**L47**	**8/12/2023**	**29/12/2023**	
52	Hash Based Indexing,	**L48**	**8/12/2023**	**3/1/2024**	
	Tree base Indexing,	**L49**	**11/12/2023**	**4/1/2024**	

53	Indexes and Performance Tuning	**L50**	**12/12/2023**	**5/1/2024**	
54	Intuitions for tree Indexes	**L51**	**13/12/2023**	**8/1/2024**	
55	Indexed Sequential Access Methods (ISAM)	**L52**	**15/12/2023**	**9/1/2024**	
56	B+ Trees: A Dynamic Index Structure	**L53**	**15/12/2023**	**20/1/2024**	

METHODS OF TEACHING:

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

NOTE:

1. Any Subject in a Semester is suppose to be completed in 55 to 65 periods.
2. Each Period is of 50 minutes.
3. Each unit duration & completion should be mentioned in the Remarks Coloumn.
4. List of Suggested books can be marked with Codes like T1, T2, R1, R2 etc.

7. Session Execution Log:

S no	Units	Scheduled started date	Completed date	Remarks
1	**I**	**9/10/2023**	**6/10/2023**	**COMPLETED**
2	**II**	**27/10/2023**	**3/11/2023**	**COMPLETED**
3	**III**	**1/12/2023**	**5/12/2023**	**COMPLETED**
4	**IV**	**20/12/2023**	**22/12/2023**	**COMPLETED**
5	**V**	**10/1/2024**	**20/1/2024**	**COMPLETED**

8. Lecture Notes – (hand written)

9. ASSIGNMENT QUESTIONS ALONG SAMPLE ASSIGNMENT SCRIPTS

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MID 1 ASSIGNMENT

ACADEMIC YEAR 2023-24

SUBJECT NAME: DBMS

1. Explain structure of DBMS with neat diagram? [CO 1]
2. What is ER Model? Draw an ER Diagram for online shopping system. [CO 1]
3. a. Explain primary key and foreign key constraints with example?
   b. Demonstrate the methods of handling violations of key constraints. [CO 2]

4. a. Explain the following operations in relational algebra with an example? [CO 2]
   i. Selection ii. Projection iii. Rename iv. Division

   b. Consider the below schemas

   Sailors (sid, sname, age, rating)
   Boats (bid, bname, color)
   Reserves (sid, bid,day)

   Solve the following relational algebra queries.
   i. Find the names of sailors whose rating is above 7
   ii. Find the names of sailors who reserved red boat
   iii. Find the sid's of sailors with age over 20 and who have not reserved a red boat. (CO 2)
5. Explain the syntax and formulas used in Tuple Relational calculus? [CO 2]

   Solve the following queries using TRC
   i. Find the names of sailors whose rating is above 7
   ii. Find the names of sailors who reserved boat 103
   iii. Find the names of sailors who reserved all boats

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MID II ASSIGNMENT

ACADEMIC YEAR 2023-24

SUBJECT NAME: DBMS

1.Define the normalization ? Explain the 1NF ,2NF ,3NF and BCNF with an example ? (CO2)

2. a) Explain the properties of transaction and states of transaction. (CO3) b) Explain the properties of conflict serializability and process of serialization with example (CO3)

3. a)Explain the lock based protocol 2PL and Strict 2PL (CO3) b) Briefly Explain Multiple granularity protocol and lock comparison (CO3)

4. Explain B+ Tree index structure with an example (CO4)

5. Describe the extendable hashing technique with an example. (CO4)

10. MID EXAM QUESTION PAPER ALONG SAMPLE ANSWER SCRIPTS

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II.B.TECH-I-SEM-I MID EXAMINATIONS, Date:21/11/2023 Time: 10:00 AM TO 12:00 PM

Subject: DBMS Branch: CSE Marks: 30 M

Note: Question paper contains two parts, Part - A and Part - B.

Part-A is compulsory which carries 10 marks. Answer all questions in part-A.

Part-B consists of (21/2) units. Answer any four question. Each question carries 5 marks and may have a, b, c sub questions.

PART-A **5x2=10 M**

1. Define the term cardinality and degree of a relation? (CO 2)
2. Define Database Schema and Instances? (CO 1)
3. What is a week entity how to demonstrate it in ER Diagram? (CO 1)
4. Define the roles and responsibilities of DBA? (CO 1)
5. Differentiate between File system and DBMS? (CO 1)

PART-B **4x5=20 M**

6. What is data model? Explain various data models with examples? (CO 1)
7. Explain structure of DBMS? (CO 1)
8. What is ER Model? Draw an ER Diagram for online shopping system. (CO 2)
9. Define views? Explain how to create and destroy views? (CO2)

10. Consider the below schemas

Sailors (sid, sname, age, rating)
Boats (bid, bname, color)
Reserves (sid, bid,day)

Solve the following relational algebra queries.

i. Find the names of sailors whose rating is above 7
ii. Find the names of sailors who reserved red boat
iii. Find the sid's of sailors with age over 20 and who have not reserved a red boat.

(CO 2)

11. a. Explain primary key and foreign key constraints with example?
b. Demonstrate the methods of handling violations of key constraints. (CO 2)

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II.B.TECH-I-SEM-I MID EXAMINATIONS, Date:08/11/2023 Time: 10:00 AM TO 12:00 PM

Subject: DBMS **Branch: CSE** **Marks: 30 M**

Note: Question paper contains two parts, Part - A and Part - B.

Part-A is compulsory which carries 10 marks. Answer all questions in part-A.

Part-B consists of (21/2) units. Answer any four questions. Each question carries 5 marks and may have a, b, c sub questions.

PART-A **5x2=10 M**

1. Discuss basic form of SQL query? (CO 3)
2. Illustrate functional dependency with example? (CO 3)
3. Explain different types of locks? (CO 4)
4. Define ACID Properties? (CO 4)
5. Define primary and secondary indexes? (CO 5)

PART-B **4x5=20 M**

1. What is functional dependency? Explain 1^{st} ,2^{nd} and 3^{rd} normal forms with examples? (CO 3)
2. Explain any four aggregate functions and nested queries with examples? (CO 3)
3. Explain log-based recovery of database? (CO 4)
4. Explain multiple granularities of locking protocol with example? (CO 5)
5. Explain search, insert and delete operations of B+ tree with examples? (CO 5)
6. Explain search, insert and delete operations of Extensible Hashing with examples? (CO 5)

11.SCHEME OF EVALUATION:

MID 1

S.NO	THEORY	MARKS	TOTAL MARKS
	PART-A		
1	Define Cardinality and Degree	2	2
2	Define Schema and Instance	2	2
3	Week entity in ER diagram	2	2
4	Roles and responsibility of DBA	2	2
5	File system vs DBMS	2	2
	PART-B		
6	Explain datamodel and its types	5	5
7	Structure of DBMS with diagram and explanation	5	5
8	ER model for online shopping	5	5
9	View creation and destroying	5	5
10	Solution to the queries	5	5
11 a.	Primary and foreign key constraints	3	5
b.	Handling violation of key constraints	2	

MID 2

S.NO	THEORY	MARKS	TOTAL MARKS
	PART-A		
1	basic form of SQL query	2	2
2	functional dependency with	2	2
3	different types of locks	2	2
4	ACID Properties definitions	2	2
5	primary and secondary indexes	2	2
	PART-B		
6	functional dependency definition and normal forms explanation	5	5
7	aggregate functions and nested queries explanation	5	5
8	log-based recovery of database	5	5
9	multiple granularities of locking protocol	5	5
10	B+ tree with examples	5	5
11	Extensible Hashing with examples	5	5

12.Mapping of COs and Pos with PSOs

COURSE	Relationship of Course Outcomes to Program Outcomes (PO AVG)													
CO-PO&PSO MATRIX	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	3	2	-	-	-	-	-	-	-	-	2	-
CO2	-	2	2	2	1	-	-	-	-	-	-	-	3	-
CO3	3	2	2	-	-	-	-	-	-	-	-	-	2	-
CO4	-	3	3	3	-	-	-	-	-	-	-	-	-	3

Mapping of COs and Pos with PEOs

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

13.Cos,POs,PSOs JUSTIFICATION

COURSE OUTCOMES

CO1: Gain knowledge of fundamentals of DBMS, database design and normal forms. [Understanding]
CO2 : Master the basics of SQL for retrieval and management of data.[Applying]
CO3 : Be acquainted with the basics of transaction processing and concurrency control. [Analyzing]
CO4 : Familiarity with database storage structures and access techniques. [Evaluating]

Justification:

CO1.: Gain knowledge of fundamentals of DBMS, database design and normal forms. [Understanding]
Correlated with PO1 strongly: Because it contributes the knowledge on fundamentals of DBMS, Database designs and various Normal forms which makes students get engineering knowledge and student can categorize different utilities. So, overall the correlation of CO1 to PO1 is good. **Correlated with PO2 moderately:** Students will be able to conduct interpretation of data and provide proper conclusions. So, overall the correlation of CO1 to PO2 is moderate. **Correlated with PO3 strongly:** because Students will be able to design the solutions to overcome the database issues. So, overall the correlation of CO1 to PO3 is good. **Correlated with PO4 moderately:** Students will be able to conduct interpretation of data and provide proper conclusions. So, overall the correlation of CO1 to PO4 is moderate **Correlated with PSO1 is moderately** because Students are able to analyze, design and develop the applications by adopting the various methods. So, overall the correlation of CO1 to PSO1 is good.

CO2: Master the basics of SQL for retrieval and management of data.[Applying]
Correlated with PO2 moderately: Because it provides basics of SQL Queries with examples. So, correlation is moderate. So, overall the correlation of CO2 to PO2 is moderate. **Correlated with PO3 moderately:** Students will be able to conduct interpretation of data and provide proper management. So, overall the correlation of CO2 to PO3 is moderate. **Correlated with PO4 moderately:** because Students will be able to design the solutions in the form of queries. So, overall the correlation of CO2 to PO4 is moderate. **Correlated with PO5 low:** Students will be able to retrieve the data and provide proper conclusions. So, overall the correlation of CO2 to PO5 is low. **Correlated with PSO1 is strongly** because Students are able to analyze, design and develop the solution by managing the data. So, overall the correlation of CO2 to PSO1 is strong.

CO3: Be acquainted with the basics of transaction processing and concurrency control. [Analyzing]
Correlated with PO1 strongly: Because it contributes the knowledge on basics of transaction processing and concurrency control. So, overall the correlation of CO3 to PO1 is strong. **Correlated with PO2 moderately:** Students will be able to perform the transactions of data and provide various concurrency control methods. So, overall the correlation of CO3 to PO2 is moderate. **Correlated with PO3 moderately:** because Students will be able to solve the problems of concurrency by using various control methods. So, overall the correlation of CO3 to PO3 is moderate. **Correlated with PSO1 moderately**: Because it provides dynamic nature by applying different transaction concepts. So CO3 Correlation is moderate with PSO1.

CO4: Familiarity with database storage structures and access techniques. [Evaluating]
Correlated with PO2 strongly: Because it provides SQL programming by using access techniques to evaluate the problems. So, overall the correlation of CO4 to PO2 is strong.
Correlated with PO3 strongly: Because it provides various access technioques for design solution of database related problems. So, overall the correlation of CO4 to PO2 is strong.
Correlated with PO4 strongly: Because it conducts investigation of database problems with various access methods. So, overall the correlation of CO4 to PO4 is strong..
Correlated with PSO2 strongly: as this course outcome provides student to identify research problems with various access techniques and storage structures. So Correlation CO4 is moderate with PSO2.

14.Attainment of COs,POs AND PSOs (Excel sheet)

15. Previous Question Papers

R16

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year I Semester Examinations, December - 2019
INTERNET OF THINGS
(Common to ECE, CSE, IT)

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)

1.a) What is meant by cloud computing? [2]
b) List the various models used in the design of an embedded system. [3]
c) What is meant by IoT and M2M? [2]
d) Write the factors influencing IoT / M2M. [3]
e) What are the advantages of Python? [2]
f) List the Language features of Python . [3]
g) List the features of Rasberry Pi. [2]
h) Give a brief note on SPI and I2C. [3]
i) How is IoT related to cloud computing? [2]
j) Describe the Cloud for IoT. [3]

PART – B

(50 Marks)

2. List and explain the IoT communication models. [10]

OR

3. Explain the Physical Design of IoT. [10]

4. Discuss the Machine to Machine Applications (M2M) for rural areas in India. [10]

OR

5. Write a short note on the following: [10]
a) YANG b) SNMP NETOPEER

6. Elaborate on Exception handling in Python. [10]

OR

7. Describe the XML and HTTP Lib in detail. [10]

8. Explain the IoT Physical Devices and Endpoints. [10]

OR

9. What language do you use to program a Raspberry Pi? Explain in detail. [10]

10.a) Give the Python web application framework.
b) Explain the Cloud Storage models and communication APIs. [4+6]

OR

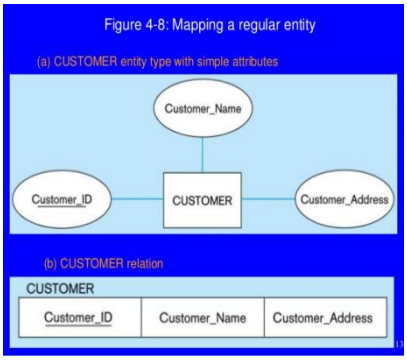
11.a) Give a brief note on the Web server for IoT.
b) Describe the Amazon Web Services for IoT. [4+6]

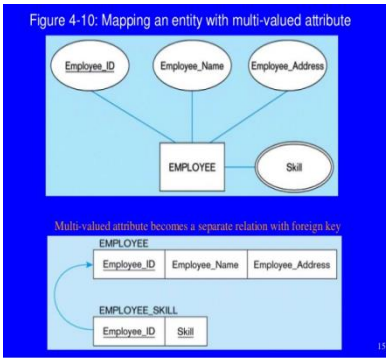
---oOo---

16.Power point presentations (PPTs)

Transforming E-R Diagrams into Relations

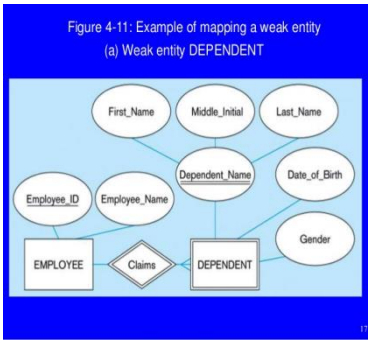
1. Mapping Regular Entities to Relations
   - Simple attributes
     - E-R attributes map directly onto the relation
   - Composite attributes
     - use only their simple, component attributes
   - Multi-valued attribute
     - becomes a separate relation with a foreign key taken from the original entity

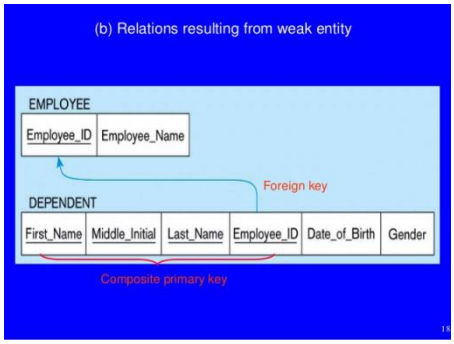




Transforming E-R Diagrams Into Relations

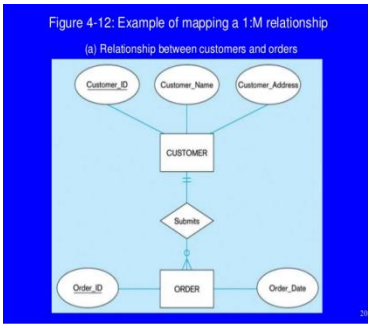
2. Mapping Weak Entities
   - becomes a separate relation with a foreign key taken from the identifying entity
   - primary key composed of
     - partial identifier of weak entity
     - primary key of identifying relation (strong entity)

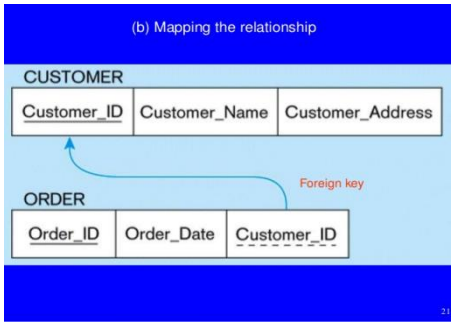


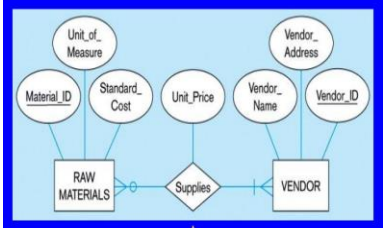


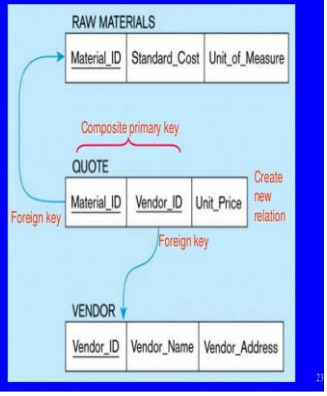
Transforming E-R Diagrams Into Relations

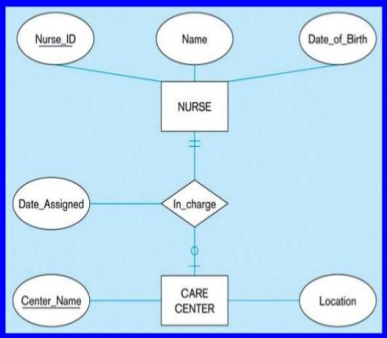
3. Mapping Binary Relationships
   - One-to-Many
     - primary key on the one side becomes a foreign key on the many side
   - Many-to-Many
     - create a new relation with the primary keys of the two entities as its primary key
   - One-to-One
     - primary key on the mandatory side becomes a foreign key on the optional side
     - avoids the need to store null values in the foreign key
     - any attributes associated with the relationship are also included in the same relation as the foreign key











17. Innovative Teaching method if any(Attached Innovative Assignment)

QUESTIONS

1. **Design an ER-Model for the following systems and explain in detail.(CO1)**
   a. **Library management System**
   b. **Hospital Management System**
   c. **Online Shopping system**
2. **Compare and Contrast the various External Data Storage systems.**

18. References (Textbook/Websites/Journals)

Textbook

1. C. J. Date, A. Kannan and S. Swamynathan, *An Introduction to Database Systems*, Pearson Education, Eighth Edition, 2009.
2. Abraham Silberschatz, Henry F. Korth and S. Sudarshan, *Database System Concepts*, McGraw-Hill Education (Asia), Fifth Edition, 2006.
3. Shio Kumar Singh, *Database Systems Concepts, Designs and Application*, Pearson Education, Second Edition, 2011.
4. Peter Rob and Carlos Coronel, *Database Systems Design, Implementation and Management*, Thomson Learning-Course Technology, Seventh Edition, 2007.
5. Patrick O'Neil and Elizabeth O'Neil, *Database Principles, Programming and Performance*, Harcourt Asia Pte. Ltd., First Edition, 2001.
6. Atul Kahate, Introduction to Database Management Systems, Pearson.

Websites or URLs e- Resources

1. https://docs.google.com/file/d/0B00naP9qt-O5X2NRd2RQbFQxT2s/edit
2. http://www.c4campus.in/2014/08/dbms-questions-and-answers-1.html
3. http://cs.ulb.ac.be/public/_media/teaching/infoh303/dbmsnotes.pdf
4. http://www.ddegjust.ac.in/studymaterial/mca-3/ms-11.pdf
5. http://www.bcanotes.com/Download/DBMS/Rdbms/database.pdf
6. http://studentstudyhub.com/wp-content/uploads/2013/12/DBMS-Full-notes- Download-Part-1.pdf
7. http://studentstudyhub.com/wp-content/uploads/2013/12/DBMS-full-notes-Download-Part-2.pdf
8. www.ieee.org
9. www.ntpel.com
10. http://elearning.vtu.ac.in/17/e-Notes/10CS54/Unit1-KRA.pdf
11. http://www.eazynotes.com/pages/database-management-system/notes.html
12. http://codex.cs.yale.edu/avi/db-book/db4/slide-dir/ch1-2.pdf
13. http://www.tutorialspoint.com/dbms/dbms_tutorial.pdf
14. www.***geeksforgeeks.org***