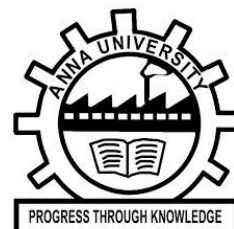


www.BrainKart.com

Anna University

for Affiliated Engineering College - 2021 Regulation



AID (Artificial Intelligence & Data Science Engineering)

1st Semester ▶

2nd Semester ▶

3rd Semester ▶

4th Semester ▶

5th Semester ▶

6th Semester ▶

7th Semester ▶

8th Semester ▶

Click on Subject/Paper under Semester to enter.

1st Semester

[Professional English - I - HS3152](#)

[Matrices and Calculus - MA3151](#)

[Engineering Physics - PH3151](#)

[Engineering Chemistry - CY3151](#)

[Problem Solving and Python Programming - GE3151](#)

2nd Semester

[Professional English - II - HS3252](#)

[Statistics and Numerical Methods - MA3251](#)

[Engineering Graphics - GE3251](#)

[Physics for Information Science - PH3256](#)

[Basic Electrical and Electronics Engineering - BE3251](#)

[Data Structures Design - AD3251](#)

3rd Semester

[Discrete Mathematics - MA3354](#)

[Digital Principles and Computer Organization - CS3351](#)

[Database Design and Management - AD3391](#)

[Design and Analysis of Algorithms - AD3351](#)

[Data Exploration and Visualization - AD3301](#)

[Artificial Intelligence - AL3391](#)

4th Semester

[Environmental Sciences and Sustainability - GE3451](#)

[Probability and Statistics - MA3391](#)

[Operating Systems - AL3452](#)

[Machine Learning - AL3451](#)

[Fundamentals of Data Science and Analytics - AD3491](#)

[Computer Networks - CS3591](#)

5th Semester

[Deep Learning - AD3501](#)

[Data and Information Security - CW3551](#)

[Distributed Computing - CS3551](#)

[Big Data Analytics - CCS334](#)

[Elective 1](#)

[Elective 2](#)

6th Semester

[Embedded Systems and IoT - CS3691](#)

[Open Elective-1](#)

[Elective-3](#)

[Elective-4](#)

[Elective-5](#)

[Elective-6](#)

7th Semester

[Human Values and Ethics - GE3791](#)

[Open Elective 2](#)

[Open Elective 3](#)

[Open Elective 4](#)

[Management Elective](#)

8th Semester

[Project Work / Internship](#)



Anna University Notes

Therithal Info
Contains ads

3.7★

199 reviews

50K+

Downloads

3+

Rated for 3+ ©

Install



BrainKart: Learning, Study App

Therithal Info
Contains ads

4.5★

160 reviews

10K+

Downloads

3+

Rated for 3+ ©

Install

All Computer Engg Subjects - [B.E., M.E.,]

(Click on Subjects to enter)

<u>Programming in C</u>	<u>Computer Networks</u>	<u>Operating Systems</u>
<u>Programming and Data Structures I</u>	<u>Programming and Data Structure II</u>	<u>Problem Solving and Python Programming</u>
<u>Database Management Systems</u>	<u>Computer Architecture</u>	<u>Analog and Digital Communication</u>
<u>Design and Analysis of Algorithms</u>	<u>Microprocessors and Microcontrollers</u>	<u>Object Oriented Analysis and Design</u>
<u>Software Engineering</u>	<u>Discrete Mathematics</u>	<u>Internet Programming</u>
<u>Theory of Computation</u>	<u>Computer Graphics</u>	<u>Distributed Systems</u>
<u>Mobile Computing</u>	<u>Compiler Design</u>	<u>Digital Signal Processing</u>
<u>Artificial Intelligence</u>	<u>Software Testing</u>	<u>Grid and Cloud Computing</u>
<u>Data Ware Housing and Data Mining</u>	<u>Cryptography and Network Security</u>	<u>Resource Management Techniques</u>
<u>Service Oriented Architecture</u>	<u>Embedded and Real Time Systems</u>	<u>Multi - Core Architectures and Programming</u>
<u>Probability and Queueing Theory</u>	<u>Physics for Information Science</u>	<u>Transforms and Partial Differential Equations</u>
<u>Technical English</u>	<u>Engineering Physics</u>	<u>Engineering Chemistry</u>
<u>Engineering Graphics</u>	<u>Total Quality Management</u>	<u>Professional Ethics in Engineering</u>
<u>Basic Electrical and Electronics and Measurement Engineering</u>	<u>Problem Solving and Python Programming</u>	<u>Environmental Science and Engineering</u>



4931_Grace College of Engineering, Thoothukudi



GRACE COLLEGE OF ENGINEERING
(Approved by AICTE, New Delhi & Affiliated to ANNA University, Chennai)
MULLAKKADU, THOOTHUKUDI - 628 005

DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

Anna University Regulation: 2021

AD3391- Database Design and Management

II Year/ III Semester

Question Bank

UNIT-III

Prepared By,

Mrs. S. KIRUTHIKA, AP/AIDS

UNIT-III PART - A

1. Why 4NF in Normal Form is more desirable than BCNF?

Ans: Because 4NF minimize the redundancy as well as make storage management. Redundancy is reduced as we normalize it further and this avoids consistency problems.

2. Define functional Dependency?

Ans: Functional dependency is a relationship that exists when one attribute uniquely determines another attribute. If R is a relation with attributes X and Y, a functional dependency between the attributes is represented as $X \rightarrow Y$, which specifies Y is functionally dependent on X. Functional Dependency (FD) is a set of constraints between two attributes in a relation.

3. State the anomalies of 1NF?

Ans: 1NF databases have some problems: Most notable: repetition of data to change a department name all tuples of the relation need to be updated since the department name can exist in multiple rows.

4. Explain entity relationship model?

Ans: ER model defines the mapping between the entities in the database. ER model is a graphical representation of real world objects with their attributes and relationship. It makes the system easily understandable. This model is considered as a top down approach for designing a requirement.

5. What is meant by lossless-join decomposition? We claim the above decomposition is lossless. How can we decide whether decomposition is lossless?

1. Let R be a relation schema.

2. Let F be a set of functional dependencies on R.

3. Let R1 and R2 form a decomposition of R. 4. The decomposition is a lossless-join decomposition of R if at least one of the following functional dependencies are in

a. $R1 \cap R2 \rightarrow R1$

b. $R1 \cap R2 \rightarrow R2$

6) Define Boyce Codd normal form? Why BCNF is stricter than 3NF?

A relation schema R is in BCNF with respect to a set F of functional dependencies if, for all functional dependencies in F, BCNF is stricter than 3NF because each and every BCNF is a relation to 3NF but every 3NF is not a relation to BCNF.

4931_Grace College of Engineering, Thoothukudi

BCNF non-transitionally dependson individual candidate key but there is no such requirement in 3NF.Hence BCNF is stricterthan 3NF.

7) What is meant by functional dependencies? What are the uses of functional dependencies?

Consider a relation schema R and $\alpha \subset R$ and $\beta \subset R$. The functional dependency holds on relational schema R if in any legal relation $r(R)$, for all pairs of tuples t_1 and t_2 in r such that $t_1[\alpha] = t_2[\alpha]$, and also $t_1[\beta] = t_2[\beta]$. To test relations to see whether they are legal under a given set of functional dependencies. To specify constraints on the set of legal relations.

8) Explain trivial dependency?

Ans : Functional dependency of the form $\alpha \rightarrow \beta$ is trivial if

$\beta \subset \alpha$ Trivial functional dependencies are satisfied by all the relations.

9) What is meant by normalization of data and Denormalization?

Ans : It is a process of analyzing the given relation schemas based on their Functional Dependencies (FDs) and primary key to achieve the properties Minimizing redundancy Minimizing insertion, deletion and updating anomalies. Denormalization: It is the process of attempting to optimize the performance of

a database by adding redundant data or by grouping data.

10. Give the properties of decomposition

Lossless-join decomposition Dependency preservation Repetition of information

11. What is 2NF?

Ans : A relation schema R is in 2NF if it is in 1NF and every non-prime attribute A in R is fully functionally dependent on primary key.

12. Define Domain / key normal form?

It is a normal form used in database normalization which requires that the database contains no constraints other than domain constraints and key constraints.

13) What are the desirable properties of decomposition? Lossless join and dependency preserving are the two desirable properties of decomposition. Lossless join decomposition property: Let R be the relational schema with instance

r is decomposed into R_1, R_2, \dots, R_n

with instance r_1, r_2, \dots, r_n .

If $r_1 \bowtie r_2 \bowtie \dots \bowtie r_n$

4931_Grace College of Engineering, Thoothukudi

$r_n = r$, then it is called Lossless Join Decomposition. i.e. if natural joins of all the decompositions gives the original relation, then it is said to be Lossless Join

Decomposition The second property of decomposition is **Dependency Preserving Decomposition**. If the original table is decomposed into multiple fragments, then somehow, we suppose to get all original FDs from these fragments. In other words, every dependency in original table must be preserved or say, every dependency must be satisfied by at least one decomposed table.

14) What is an entity relationship model?

The entity relationship model is a collection of basic objects called entities and relationship among those objects. An entity is a thing or object in the real world that is distinguishable from other objects.

15) What are attributes? Give examples.

Ans : An entity is represented by a set of attributes. Attributes are descriptive properties possessed by each member of an entity set. Example

: possible attributes of customer entity are customer name, customer id, customer street, customer city.

16) What is relationship? What is meant by the degree of relationship set?

Ans : A relationship is an association among several entities. Example: A depositor relationship associates a customer with each account that he/she has. The degree of relationship type is the number of participating entity types

17) Define the terms Entity set and Relationship set? Ans: Entity set: The set of all entities of the same type is termed as an entity set. Relationship set: The set of all relationships of the same type is termed as a relationship set.

18) Define single valued and multivalued attributes.

Ans : Single valued attributes: attributes with a single value for a particular entity are called single valued attributes. Multivalued attributes: Attributes with a set of value for a particular entity are called multivalued attributes.

19) What are stored and derived attributes?

Ans : Stored attributes: The attributes stored in a data base are called stored attributes. Derived attributes: The attributes that are derived from the stored attributes are called derived attributes.

20) Define the terms i) Entity type ii) Entity set

4931_Grace College of Engineering, Thoothukudi

Entity type: An entity type defines a collection of entities that have the same attributes.

Entity set: The set of all entities of the same type is termed as an entity set.

21) Define weak and strong entity sets?

Ans : Weak entity set: entity set that do not have key attribute of their own are called weak entity sets. Strong entity set: Entity set that has a primary key is termed a strong entity set.

PART – B

1. Construct an E-R diagram for a car insurance company whose customers own one or more cars each. Each car has associated with it zero to any number of recorded accidents. Each insurance policy covers one or more cars, and has one or more premium payments associated with it. Each payment is for a particular period of time and has an associated due date, and the date when the payment was received?

2. Discuss the correspondence between the ER model construct and the relational model constructs. Show how each ER model construct can be mapped to the relational model. Discuss the option for mapping EER model construct?

3. Explain in detail about Functional Dependencies? Briefly discuss about the Functional Dependency Concepts?

4. A car rental company maintains a database for all vehicles in its current fleet. For all vehicles, it includes the vehicle identification number, license number, manufacturer, model, date of purchase and color. Special data are included for certain types of vehicles. Trucks: cargo capacity Sports car: horsepower, renter age requirement Vans: number of passengers Off-road vehicle: ground clearance, drive train (four or two-wheeler drive) Construct an ER model for the car rental company database.

5. State the need for normalization of a Database and Explain the various Normal Forms (1st, 2nd, 3rd, BCNF, 4th, 5th and

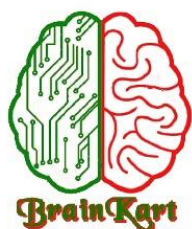
Domain-key) with suitable examples? (Or) Exemplify multi value dependency and fourth normal form (4NF) and join dependency and fifth 5th normal form (5NF)? ((OR) What is Normalization? Explain in detail about all Normal Forms

6. Draw E-R diagram for the “Restaurant menu ordering system” that will facilitate the food items ordering and services within a restaurant. The entire restaurant scenario is detailed as follows. The customer is able to view the food items menu, call the waiter, place orders and obtain the final bill through the computer kept in their table. The waiters through their wireless tablet PC are able to initialize a table for customer, control the table functions to assist customers, orders, send orders to food preparation staff (chef) and finalize the

4931_Grace College of Engineering, Thoothukudi

customers bill. The food preparation staffs(chefs), with their touch-display interfaces to the system, are able to view orders sent to the kitchen by waiters. During preparation, they are able to let the waiter know the status of each item and can send notifications when items are completed. The system should have full accountability and logging facilities and should support supervisor actions to account for exceptional circumstances such as meal being refunded or walked out on?

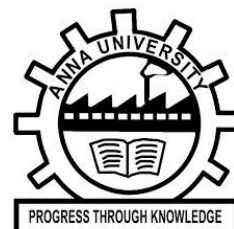
GRACE COE



www.BrainKart.com

Anna University

for Affiliated Engineering College - 2021 Regulation



AID (Artificial Intelligence & Data Science Engineering)

1st Semester ▶

2nd Semester ▶

3rd Semester ▶

4th Semester ▶

5th Semester ▶

6th Semester ▶

7th Semester ▶

8th Semester ▶

Click on Subject/Paper under Semester to enter.

1st Semester

[Professional English - I - HS3152](#)

[Matrices and Calculus - MA3151](#)

[Engineering Physics - PH3151](#)

[Engineering Chemistry - CY3151](#)

[Problem Solving and Python Programming - GE3151](#)

2nd Semester

[Professional English - II - HS3252](#)

[Statistics and Numerical Methods - MA3251](#)

[Engineering Graphics - GE3251](#)

[Physics for Information Science - PH3256](#)

[Basic Electrical and Electronics Engineering - BE3251](#)

[Data Structures Design - AD3251](#)

3rd Semester

[Discrete Mathematics - MA3354](#)

[Digital Principles and Computer Organization - CS3351](#)

[Database Design and Management - AD3391](#)

[Design and Analysis of Algorithms - AD3351](#)

[Data Exploration and Visualization - AD3301](#)

[Artificial Intelligence - AL3391](#)

4th Semester

[Environmental Sciences and Sustainability - GE3451](#)

[Probability and Statistics - MA3391](#)

[Operating Systems - AL3452](#)

[Machine Learning - AL3451](#)

[Fundamentals of Data Science and Analytics - AD3491](#)

[Computer Networks - CS3591](#)

5th Semester

[Deep Learning - AD3501](#)

[Data and Information Security - CW3551](#)

[Distributed Computing - CS3551](#)

[Big Data Analytics - CCS334](#)

[Elective 1](#)

[Elective 2](#)

6th Semester

[Embedded Systems and IoT - CS3691](#)

[Open Elective-1](#)

[Elective-3](#)

[Elective-4](#)

[Elective-5](#)

[Elective-6](#)

7th Semester

[Human Values and Ethics - GE3791](#)

[Open Elective 2](#)

[Open Elective 3](#)

[Open Elective 4](#)

[Management Elective](#)

8th Semester

[Project Work / Internship](#)



Anna University Notes

Therithal Info
Contains ads

3.7★

199 reviews

50K+

Downloads

3+

Rated for 3+ ©

Install



BrainKart: Learning, Study App

Therithal Info
Contains ads

4.5★

160 reviews

10K+

Downloads

3+

Rated for 3+ ©

Install

All Computer Engg Subjects - [B.E., M.E.,]

(Click on Subjects to enter)

<u>Programming in C</u>	<u>Computer Networks</u>	<u>Operating Systems</u>
<u>Programming and Data Structures I</u>	<u>Programming and Data Structure II</u>	<u>Problem Solving and Python Programming</u>
<u>Database Management Systems</u>	<u>Computer Architecture</u>	<u>Analog and Digital Communication</u>
<u>Design and Analysis of Algorithms</u>	<u>Microprocessors and Microcontrollers</u>	<u>Object Oriented Analysis and Design</u>
<u>Software Engineering</u>	<u>Discrete Mathematics</u>	<u>Internet Programming</u>
<u>Theory of Computation</u>	<u>Computer Graphics</u>	<u>Distributed Systems</u>
<u>Mobile Computing</u>	<u>Compiler Design</u>	<u>Digital Signal Processing</u>
<u>Artificial Intelligence</u>	<u>Software Testing</u>	<u>Grid and Cloud Computing</u>
<u>Data Ware Housing and Data Mining</u>	<u>Cryptography and Network Security</u>	<u>Resource Management Techniques</u>
<u>Service Oriented Architecture</u>	<u>Embedded and Real Time Systems</u>	<u>Multi - Core Architectures and Programming</u>
<u>Probability and Queueing Theory</u>	<u>Physics for Information Science</u>	<u>Transforms and Partial Differential Equations</u>
<u>Technical English</u>	<u>Engineering Physics</u>	<u>Engineering Chemistry</u>
<u>Engineering Graphics</u>	<u>Total Quality Management</u>	<u>Professional Ethics in Engineering</u>
<u>Basic Electrical and Electronics and Measurement Engineering</u>	<u>Problem Solving and Python Programming</u>	<u>Environmental Science and Engineering</u>

