16/6/23 - FN.

Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 30010

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2023.

Third Semester

Artificial Intelligence and Data Science

AD 3391 – DATABASE DESIGN AND MANAGEMENT

(Regulations 2021)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is quaternary in UML? Give an example.
2. Compare between Centralized Approach and View Integration Approach in requirement collection.
3. What is a Referential Integrity? Give an example.
4. Why do we need view in SQL?
5. Compare between ER model and EER model.
6. Write a note on BCNF normal form.
7. Define granularity.
8. How serializability is guaranteed by Two – Phase Locking technique?
9. State the CAP theorem in NOSQL.
10. Compare between subtypes and supertypes.

PART B — (5 × 13 = 65 marks)

11. (a) (i) Illustrate in detail about the three levels (external, conceptual, internal) of database architecture. (7)

(ii) Outline the flow of database system development lifecycle and explain. (6)

Or

(b) (i) Exemplify in detail about the diagrammatic representation of entity and relationship types in UML. (7)

(ii) Compare and contrast between specialization and generalization process in Enhanced ER modeling. (6)

12. (a) Describe in detail about the relationship between mathematical relations and relations in the relational data model.

Or

(b) (i) Explain in detail about SELECT statement in SQL with its general form and examples. (7)

(ii) Discuss in detail about SQL datatypes with examples. (6)

13. (a) Illustrate in detail about Functional dependencies with relevant examples.

Or

(b) Exemplify in detail about First, Second and Third Normalization with relevant examples.

14. (a) (i) Sketch the state transition diagram for a database transaction and explain the flow. (7)

(ii) Describe the ACID properties of transaction processing. (6)

Or

(b) Discuss in detail about Two Phase Locking and Timestamp based protocols in Concurrency Control.

15. (a) Explain in detail about Object Relational Data Model with diagram.

Or

(b) Discuss in depth about MongoDB database and its CRUD operations with an example application.

PART C — (1 × 15 = 15 marks)

16. (a) Create an Entity – Relationship diagram for a car dealership. The dealership sells both new and used cars, and it operates a service facility. Base your design on the following business rules:

- A salesperson may sell many cars, but each car is sold by only one salesperson.

- A customer may buy many cars, but each car is bought by only one customer.
- A salesperson writes a single invoice for each car he or she sells.
- A customer gets an invoice for each car he or she buys.
- A customer may come in just to have his or her car serviced; that is, a customer need not buy a car to be classified as a customer.
- When a customer takes one or more cars in for repair or service, one service ticket is written for each car.
- The car dealership maintains a service history for each of the cars serviced. The service records are referenced by the car's serial number.
- A car brought in for service can be worked on by many mechanics, and each mechanic may work on many cars.
- A car that is serviced may or may not need parts (e.g., adjusting a carburetor or cleaning a fuel injector nozzle does not require providing new parts)

Or

(b) Create the following tables using SQL

Employee (FName, Middle, LName, SSN, BDate, Address, Sex, Salary, SupervisorSSN, DeptNo)

Department (DName, DeptNo, Manager SSN, StattDate)

Write SQL queries to perform the following tasks:

(i) Find the sum of the salaries of all employees of the 'Accounts' department as well as the maximum salary, the minimum salary, and the average salary in this department.

(ii) Retrieve the name of each employee Controlled by department number 5

(iii) Retrieve the name of each Dept and number of employees working in each department which has at least 2 employees.

(iv) Retrieve the name of employees who born in the year 1990's.

(v) Retrieve the name of employees and their Dept name.

———————

www.BrainKart.com

Anna University

for Affilated 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

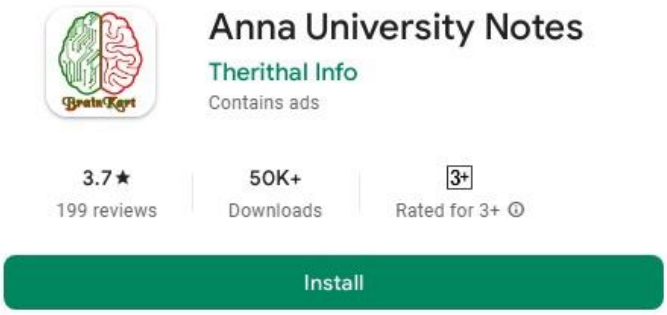
- Embedded Systems and IoT - CS3691
- Open Elective-1
- Elective-3
- Elective-4
- Elective-5
- Elective-6

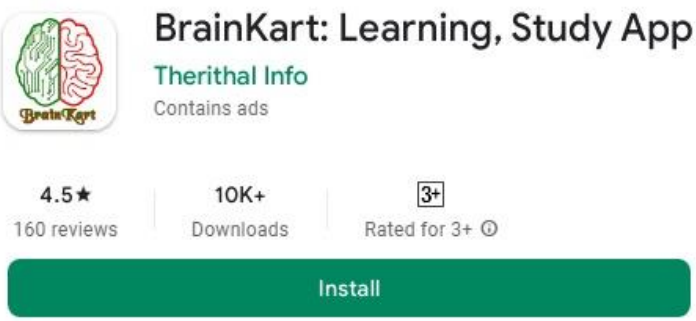
7th Semester

- Human Values and Ethics - GE3791
- Open Elective 2
- Open Elective 3
- Open Elective 4
- Management Elective

8th Semester

- Project Work / Intership





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