



**SAGAR INSTITUTE OF SCIENCE & TECHNOLOGY(SISTec)
DEPARTMENT OF ARTIFICIAL INTELLIGENCE & DATA
SCIENCE**

QUESTION BANK

BRANCH AI&DS

SESSION 2023-24

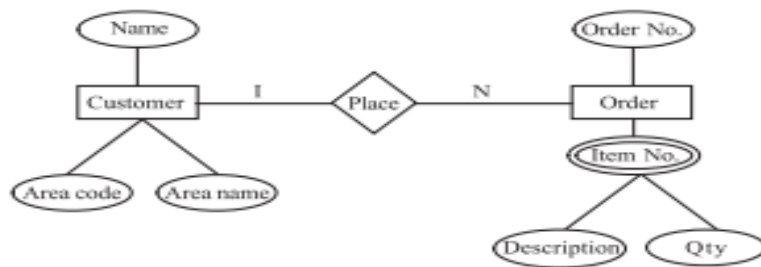
ME OF THE FACULTY: Amit Swami

SUBJECT/CODE : DBMS/ AD-402

UNIT-I

Questions	Bloom's Taxonomy Level	COs
Q1. Explain about database system architecture in detail.	2(Understand)	CO1
Q2. What are the functions of DBA?	2(Understand)	CO1
Q3. Define the concept of aggregation, specialization and generalization. Give several examples of where this concept is useful.	2(Understand)	CO1
Q4. How the data-based approach is different from file-based approach.	2(Understand)	CO1
Q5. Explain three level schema architecture of DBMS. Explain how does it leads to data independence.	3(Apply)	CO1
Q6. Construct an E-R diagram for hospital with a set of patients and a set of doctors. Associate with each patient a log of the various tests and examination conducted. Also show tables for various entities with attributes .	3(Apply)	CO1
Q7. Draw an E-R diagram of university by determining entities of interest and the relationships that exist between these entities. Also transform it into a table.	4(Analyze)	CO1
Q8. Draw an ER diagram for a small marketing company database. Assume suitable data.	4(Analyze)	CO1
Q9. Why the hierarchical data model is considered inflexible?	3(Apply)	CO1
Q10. Explain following terms: i) Data and information ii) Strong and weak entity set iii) Attribute iv) Types of attribute v) Physical and logical data independence vi) Total and partial participation vii) Instances	2(Understand)	CO1
Q11. Explain strong and weak entities. How weak entity can be converted to a strong entity.	2(Understand)	CO1
Q12. Reduce the following ER diagram into tables. Also explain composite	3(Apply)	CO1

attribute, Multivalued attribute, derived attribute.



UNIT-II

Questions	Bloom's Taxonomy Level	COs
Q1: What are the characteristics of a relation? Also explain domain, tuple, degree, attribute, cardinality.	2(Understand)	CO2
Q2. Explain select, project, Cartesian product, join, division, union, intersection etc. with suitable examples.	2(Understand)	CO2
Q3. Explain integrity constraints with example.	2(Understand)	CO2
Q4. Write the commands of DDL, DML, DCL and TCL.	2(Understand)	CO2
Q5. What are the aggregate functions of SQL?	2(Understand)	CO2
Q6. Write short note on Primary Index and Secondary Index.	2(Understand)	CO2
Q7. Differentiate between Relational calculus and Relational algebra.	4(Analyze)	CO2
Q8. Consider the employee data. Give an expression in SQL and Relational algebra for the following query: Employee (employee-name, street, city) Works (employee-name, company-name, salary) Company (company-name, city) Manages (employee-name, manager-name) <ol style="list-style-type: none"> Find the name of all employees who work for State Bank. Find the names and cities of residence of all employees who work for HDFC Bank. Find the all employees who do not work for State Bank and ICICI Bank. Find the all employees who belongs same city where they are working. Find the employee name and his salary whose manager is Ravi. 	3(Apply)	CO2
Q9. We have following relations: Emp (empno, ename, jobtitle, managerno, hiredte, sal, comm, deptno) Dept (deptno, dname, loc) Answer the following: <ol style="list-style-type: none"> Write SQL and relational algebra query to find the employees working in the department 10, 20, 30. Write SQL query to find employees whose names starts with letter A or a. 	3(Apply)	CO2

iii) Write SQL query find the employee and his department name. iv) Find the employees who are working in Smith's department. v) Find the employees who get more than Allen's salary. vi) Find the employees whose manager is KING. vii) Display the employees who are getting maximum salary in each department.		
Q10. Explain following: i) Keys ii) Primary, composite candidate and super key iii) Theta Join iv) Outer Join v) Intension and Extension	2(Understand)	CO2
Q.11 Consider the following relations (primary keys are underlined)? i. Account (acc-no, balance, branch-name) ii. Depositor (acc-no, cust-no) iii. Customer (cust-no, name, city) iv. Loan (loan-no, amt, branch-name) v. Borrower (cust-no, loan-no) Solve the following queries using SQL. 1) Find all customer-no and loan-no who have a loan at the 'Perryridge' branch. 2) Find all customer who have an account but no loan at the bank. 3) Find branch-name and average account balance where average account balance is greater than 1000.	3(Apply)	CO2
Q12. Consider the employee data. Give an expression in SQL and Relational algebra for the following query: Employee (employee-name, street, city) Works (employee-name, company-name, salary) Company (company-name, city) Manages (employee-name, manager-name) i) Find the names employees who work for first bank cooperation. ii) Find the name, street address and cities of residence of all employees who work for First Bank Corporation and earn more than 200000 per annum.	3(Apply)	CO2

UNIT-III

Questions	Bloom's Taxonomy Level	COs
Q1: Define redundancy?	2(Understand)	CO3
Q2: Define functional dependency? Why are some functional dependencies trivial?	2(Understand)	CO3
Q3: Discuss normalization?	2(Understand)	CO3
Q4: Illustrate functional dependency with example?	2(Understand)	CO3
Q5: Illustrate fully functional dependency with example?	2(Understand)	CO3
Q6: Demonstrate transitive dependency? Give an example?	2(Understand)	CO3

Q7: Consider a relation scheme $R = (A, B, C, D, E, H)$ on which the following functional dependencies hold: $\{A \rightarrow B, BC \rightarrow D, E \rightarrow C, D \rightarrow A\}$. Write the Candidate keys of R?	3(Apply)	CO3
Q8: Consider the following relational schemes for a library database: Book (Title, Author, Catalog_no, Publisher, Year, Price) Collection (Title, Author, Catalog_no) the following are functional dependencies: <ol style="list-style-type: none"> Title Author \rightarrow Catalog_no Catalog_no \rightarrow Title Author Publisher Year Publisher Title Year \rightarrow Price Assume { Author, Title } is the key for both schemes. Apply the appropriate normal form for Book and Cancellation? 	3(Apply)	CO3
Q9: Consider a schema $R (A, B, C, D)$ and functional dependencies $A \rightarrow B$ and $C \rightarrow D$. Solve and find whether the decomposition of R into $R_1 (A, B)$ and $R_2 (C, D)$ belongs to which one or both (dependency preserving and loss less join)? Show that: if $\alpha \rightarrow \beta$ and $\alpha \rightarrow \gamma$ then $\alpha \rightarrow \beta\gamma$	3(Apply)	CO3
Q10: Discuss about Join dependencies and Fifth normal form?	2(Understand)	CO3
Q11: Consider the universal relation $R\{A, B, C, D, E, F, G, H, I\}$ and the set of functional dependencies $F=\{A, B\} \rightarrow \{C\}, \{A\} \rightarrow \{D, E\}, \{B\} \rightarrow \{F\}, \{F\} \rightarrow \{G, H\}, \{D\} \rightarrow \{I, J\}$. What is the key for R? Decompose R into 2NF, then 3NF relations.	3(Apply)	CO3
Q12: Consider a relation R with five attributes A, B, C, D, E having following dependencies $A \rightarrow B, BC \rightarrow E$ and $ED \rightarrow A$ List all keys for R In which normal form table is justify your answer	3(Apply)	CO3
Q13: Compute the closure of the following FD for the relation schema. $R=\{A, B, C, D, E\}$ $A \rightarrow BC$ $CD \rightarrow E$ $B \rightarrow D$ $E \rightarrow A$ List the candidate key R, reduce it in 3 NF also.	3(Apply)	CO3
Q14. Find out the minimal cover of the following FD set. Are the sets equivalent. F : $A \rightarrow B, AB \rightarrow C, D \rightarrow AC, D \rightarrow E$ G : $A \rightarrow BC, D \rightarrow AE$	3(Apply)	CO3

UNIT-IV

Questions	Bloom's Taxonomy Level	COs
Q1: Explain ACID properties and illustrate them through examples?	2(Understand)	CO4
Q2: Discuss how do you implement Atomicity and Durability?	2(Understand)	CO4
Q3: Illustrate Concurrent execution of transaction with examples?	2(Understand)	CO4
Q4: Discuss Serializability in detail?	2(Understand)	CO4
Q5: Discuss two phase locking protocol and strict two phase locking protocols?	2(Understand)	CO4
Q6: Describe Timestamp based locking protocols?	2(Understand)	CO4
Q7: Describe Validation-based locking protocols?	2(Understand)	CO4
Q8: Analyze which of the following concurrency control protocols ensure both conflict serializability and freedom from deadlock? Explain the following: a. 2-phase locking b. Time-stamp ordering	4(Analyze)	CO4
Q9: Consider the transactions T1, T2, and T3 and the schedules S1 and S2 given below. T1: r1(X);r1(Z);w1(X);w1(Z) T2: r2(Y);r2(Z);w2(Z) T3: r3(Y);r3(X);w3(Y) S1: r1(X);r3(Y);r3(X);r2(Y);r2(Z); w3(Y);w2(Z);r1(Z);w1(X);w1(Z) S2: r1(X); r3(Y); r2(Y); r3(X); r1(Z);r2(Z); w3(Y); w1(X); w2(Z); w1(Z) Analyze which one of the schedules is conflict-serializable?	4(Analyze)	CO4
Q10: Suppose that there is a database system that never fails. Analyze whether a recovery manager required for this system	4(Analyze)	CO4
Q11: Test for view serializability on following: S1: R1(A),R2(B),W1(A),W2(B) S2: R2 (B),R1(A),W2(A),W2(B) S1: R1(A), W1(A), R2(B), W2(B), R1(B) S2: R1 (A),W1(A), R1(B), R2(B), W2(B)	4(Analyze)	CO4
Q12. Differentiate between OODBMS and DBMS.	2(Understand)	CO4

UNIT-V

Questions	Bloom's Taxonomy Level	COs
Q1: Explain architecture of ORACLE and its components	2(Understand)	CO5
Q2: Explain Distributed database system?	2(Understand)	CO5
Q3: How Distributed system is different from centralized database system. Give the uses of distributed Database system	2(Understand)	CO5
Q4: What is trigger explain with suitable example	2(Understand)	CO5
Q5: What is Cursor explain with suitable example	2(Understand)	CO5
Q6: What is Procedure explain with suitable example	2(Understand)	CO5
Q7: What is join discuss different type of join	2(Understand)	CO5
Q8: Discuss user management process in detail	2(Understand)	CO5
Q9. Differentiate between implicit and explicit cursor	4(Analyze)	CO5
Q10. What is inline queries? Where it is used?	2(Understand)	CO5
Q11. What is PL/SQL exception handling and why it is need?	2(Understand)	CO5
Q12. For a given relation employee(id, name, salary, dept_no , dname), write a procedure to display the employee record for given dept_no (Note: for given department there may be more than one employees).	3(Apply)	CO5