ADVANCED DATABASE MANAGEMENT SYSTEM

1. Discuss Relational Data Model along with its advantages and disadvantages.
2. Define data integrity. Explain Entity Integrity Rule or Referential Integrity Rule.
3. Explain problems with the file system.
4. Define the following terms.
   Candidate Key, Primary Key, Foreign Key, Secondary Key, Composite Key, Super Key, Data, Field, Record, Information, Database Management System, Database, Metadata
5. Write short notes on the following.
   (i) Structural and Data dependence
   (ii) Importance of Database Design
6. What is Data Dictionary? Explain with example.
7. Discuss Hierarchical Data Model along with its advantages and disadvantages.
8. Discuss Network Data Model along with its advantages and disadvantages.
9. Discuss Objet-Oriented Data Model along with its advantages and disadvantages.
10. Discuss relational set operators.
11. Explain architecture of DBMS.
12. State whether the following statements are true or false.
    (i) There is only one conceptual level, but there are more than one internal level in DBMS.
    (ii) The hierarchical model supports M:N type of relationship.
    (iii) The network model supports 1:M type of relationship.
    (iv) Table is a three dimensional structure.
    (v) If we change table characteristics, but there is no need to change application program, it is said to be structural independence.
    (vi) The network model supports DDL and DML.
    (vii) There may be more than one primary key in a table.
    (viii) Foreign key cannot contain null.

13. Discuss 1NF, 2NF and 3NF with examples.
14. Write short note on Denormalization.
15. Explain different types of dependencies.
16. List and explain symbols used to draw Chen Model of E-R Diagram.
17. Define the following terms :
    (i) Entities
    (ii) Attributes
    (iii) Domains
    (iv) Identifiers
    (v) Composite Primary Keys
    (vi) Composite and Simple Attributes
    (vii) Single-valued Attributes
    (viii) Multi-valued Attributes
    (ix) Derived Attribute
    (x) Relationship
    (xi) Participant
    (xii) Weak Entity
    (xiii) Optional Participation
    (xiv) Mandatory Participation
    (xv) Composite/bridge Entity
18. How would you identify each of the following in a Crow's Foot Model?
    An entity, The cardinality (0,N), A weak relationship, A strong relationship
19. Discuss the difference between a composite entity and a composite attribute. How would each be indicated in an ERD?
20. How the problem of Multi-valued Attribute be resolved?

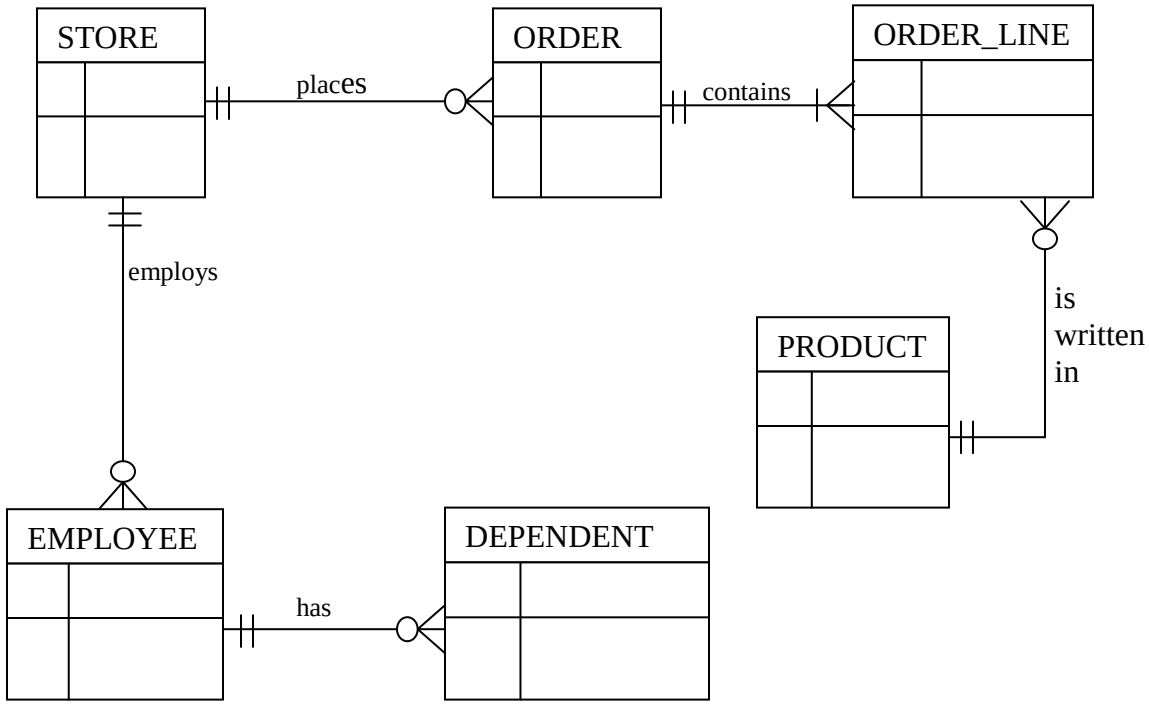
21. Write in brief about Existence Dependence. What is mandatory foreign key?
22. Explain Weak Relationship and Strong Relationship.
23. Explain Relationship degree along with the concept of Recursive Relationship.
24. Use the following business rules to draw ERD.
    (i) An invoice is written by a salesrep. Each sales representative can write many invoices, but each invoice is written a single sales representative.
    (ii) The invoice is written for a single customer. However, each customer can have many invoices.
    (iii) An invoice can include many detail lines, which describe the products bought by the customer.
    (iv) The product information is stored in a product entity.
    (v) The product's vendor information is found in a vendor entity.
25. Use the following business rules to draw ERD.
    (i) A patient can make many appointments with one or more doctors in the clinic, and a doctor can accept appointments with many patients. However, each appointment is made with only one doctor, and each appointment references a single patient.
    (ii) Emergency cases don't require an appointment. However, for appointment management purposes, an emergency is entered in the appointment book as "unscheduled".
    (iii) If kept, an appointment yields a visit with the doctor specified in the appointment. The visit yields a diagnosis and, when appropriate, treatment.
    (iv) With each visit, the patient's records are updated to provide a medical history.
    (v) Each patient visit creates a bill. Each patient visit is billed by one doctor, and each doctor can bill many patients.
26. Use the following business rules to draw ERD.
    (i) A department employs many employees, but each employee is employed by one department.
    (ii) Some employees are not assigned to any department.
    (iii) A division operates many departments, but each department is operated by one division.
    (iv) An employee may be assigned many projects, and a project may have many employees assigned to it.
    (v) A project must have at least one employee assigned to it.
    (vi) One of the employees manages each department, and each department is managed by only one employee.
    (vii) One of the employees runs each division, and each division is run by only one employee.
27. Draw E-R Model for the scenario given below :
    A customer comes to a hotel and checks for room availability from the hotel manager. The hotel manager enquires about number of persons and explains him different types of room available and their tariffs. The customer books a room and gives his contact and stay details. At the end of the stay, the customer enquires about payment options. The manager confirms that payment options can be made by cash or card and gives him the bill. The customer makes the payment to the manager.
28. Draw ERD for the following rules.

(i) Each department employs one or more employees.
(ii) Each of the employees may or may not have one or more dependents.
(iii) Each employee may or may not have an employment history.
(iv) Each employee may or may not work on many projects.
(v) Each project may be assigned to many employees.
(vi) Each employee reports to the project leader.

29. Draw ERD for the following rules.

A customer requests a video on rent. The salesperson explains him various membership plans. The customer selects one of the membership plan by giving his contact details and paying membership fees. The member enquires about films in different languages. The salesperson shows the list of film videos in different languages. The member selects the video. After the video is rented, the salesperson updates the number of film copies already rented.

30. For the ERD given below answer the following questions.



a. Write ten cardinalities that are appropriate for this ERD.
b. Write the business rules reflected in this ERD.
c. What two attributes must be contained in the composite entity between STORE and PRODUCT?

31. Normalize the following table up to 3NF.

Bill No	Table No	Date	Emp No	Dish No	Dish Desc	Price	Emp Skill	Emp Name	Qty	Tip	Total
34	12	2-4-10	56	50	Coffee	2.5	Waiter	Ram	2	3.9	26.0
34	12	2-4-10	56	250	Club	10.5	Waiter	Ram	2	3.9	26.0

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35	17	3-4-10	61	300	Pizza	14.5	Waiter	Shyam	1	2.2	14.5
36	14	3-4-10	61	50	Coffee	2.5	Waiter	Shyam	2	10.0	100.0
36	14	3-4-10	61	100	Scrambled Eggs	7.5	Waiter	Shyam	4	10.0	100.0
36	14	3-4-10	61	200	French Fries	10.0	Waiter	Shyam	2	10.0	100.0
36	14	3-4-10	61	150	Thick Shake	15.0	Waiter	Shyam	3	10.0	100.0
37	12	4-4-10	59	300	Pizza	14.5	Waiter	Raja	2	1.0	29.0
38	8	4-4-10	56	50	Coffee	2.5	Waiter	Ram	2	0.0	11.0
38	8	4-4-10	56	25	Black Tea	3.0	Waiter	Ram	2	0.0	11.0

32. Normalize the following table up to 3NF. What is a surrogate key?

Order no	Order date	Vendor no	Vendor desc	Product no	Product desc	Product price (Rs.)	Order qty	Order price (Rs.)	Discount amount	Final price (Rs.)
12	9-1-05	100	M & Sons	1001	Radio	100	20	2,000	500	1,500
12	9-1-05	100	M & Sons	1002	TV	50,000	10	5,00,000	20,000	4,80,000
12	9-1-05	100	M & Sons	1003	Clock	500	10	5,000	200	4,800
13	9-1-05	105	BB Inc	2001	MP3 Player	3,000	10	30,000	500	29,500
13	9-1-05	105	BB Inc	2002	I Pod	5,000	100	5,00,000	5,000	4,95,000
13	9-1-05	105	BB Inc	2003	Speaker	1,000	10	10,000	2,000	8,000
14	10-1-05	100	M & Sons	1002	TV	50,000	5	2,50,000	10,000	2,40,000
14	10-1-05	100	M & Sons	1003	Clock	500	20	10,000	1,000	9,000
14	10-1-05	100	M & Sons	1001	Radio	100	10	1,000	100	900
15	10-1-05	105	BB Inc	2002	I Pod	5,000	2	10,000	100	9,900

33. Write short notes.

a. Properties of Transaction
b. Open Source Database
c. Database Security
d. DDBMS Components
e. Shared/Exclusive Lock
f. States of Transaction
g. Mobile Database
h. Database Backup and Recovery
i. DDBMS Advantages
j. Deadlock
k. Moving Object Database
l. Data Warehousing and Data Mining
m. Transaction
n. DDBMS Disadvantages
o. Concurrency Control

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