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| Cycle No | Course Outcomes | Cycle Problem Topic | Date of Practice |
| 1 | **1**  **1**  **1**  **1**  **1**  **1**  **1**  **1** | Imagine that an organization has many divisions. Each division consists of  many branches and each branch consists of many employees. Draw an ER  Diagram and create the schema for the database objects – **ER Diagram 1** |  |
| 2 | Given the following rules, create an appropriate ERD Diagram and the  schema for the database objects   * A company operates many departments * Each department employs one or more employees * Each of the employee may or may not have one or more dependents * Each employee may or may not have an employee history   **ER Diagram 2** |  |
| 3 | Draw the ER Diagram that models the information requirements in the  following scenario. Create the schema  A manufacturing company has several assembly plants in different cities.  Each plant produces one product that requires certain parts in the assembly.  Parts are from appropriate suppliers located in different cities  – **ER Diagram 3** |  |
| 4 | Use the following business rules to create the ER Diagram. Write all appropriate connections and cardinalities in the ER Diagram   * A department employs many employees but each employee is employed by one department * A division operates many departments * An employee may be assigned many projects. A project may have many employees assigned to it * A project must have at least one employee assigned to it * One of the employee manages each department. Each department is managed by one employee * One of the employees run each division, each division is run by one employee – **ER Diagram 4** |  |
| 5 | College consists of several departments. Department employ teachers and  programme courses. Course is conducted in semesters. Each semester comprises of  several subjects. Students attend the class to learn a subject. Subjects are assessed by  examinations  Given the above rules, create the appropriate Entity Relationship Diagram (ERD) using Chen methodology or Crow’s Foot technique– **ER Diagram 5** |  |
| 6 | Create a database object, TABLE (Organization), with the following attributes and constraints based on ER Diagram 1   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | SNo | Column Name | Data Type | Length | Constraint | Remarks | | 1 | Orgn\_Id | NUMBER | 8 | NOT NULL, PK | Organization Id | | 2 | Orgn\_Name | VARCHAR | 50 | NOT NULL | Organization Name | | 3 | Orgn\_CEO | VARCHAR | 25 | NULL | Organization Chairman | | 4 | Orgn\_Business | VARCHAR | 25 | NOT NULL, CHECK | Type of business of organization | | 5 | Orgn\_Contact | VARCHAR | 25 | NULL | Organization contact person | | 6 | Orgn\_Phone\_No | VARCHAR | 15 | NULL | Organization phone number | |  |
| 6 | Create a database object, TABLE (Division), with the following attributes and constraints   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | SNo | Column Name | Data Type | Length | Constraint | Remarks | | 1 | Divn\_Id | NUMBER | 8 | NOT NULL | Division Id | | 2 | Divn \_Name | VARCHAR | 50 | NOT NULL | Division Name | | 3 | Divn \_Head | VARCHAR | 50 | NOT NULL | Division Head | | 4 | Divn \_Location | VARCHAR | 25 | NOT NULL | City where division is located | | 5 | Divn \_Contact | VARCHAR | 25 | NULL | Division contact person | | 6 | Divn \_Phone\_No | VARCHAR | 15 | NULL | Division phone number | | 7 | Orgn\_Id | NUMBER | 8 | NOT NULL | Organization Id | |  |
| 7 | Create a database object, TABLE (Branch), with the following attributes and constraints. Create the constraints at the *table* level   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | SNo | Column Name | Data Type | Length | Constraint | Remarks | | 1 | Bran\_Id | NUMBER | 8 | NOT NUL | Branch Id. | | 2 | Bran \_Name | VARCHAR | 25 | NOT NULL | Branch Name. City where branch is located | | 3 | Bran \_ Head | VARCHAR | 25 | NULL | Branch Manager’s name | | 4 | Bran \_Total\_Emp | NUMBER | 25 | NOT NULL | Total employees in the branch | | 5 | Bran \_Contact | VARCHAR | 25 | NULL | Branch contact person | | 6 | Bran \_Phone\_No | VARCHAR | 15 | NOT NULL, CHECK | Branch phone number | | 7 | Divn\_Id | NUMBER | 8 | NOT NULL | Division Id | |  | Create PK and FK for the table after defining all columns | | | | | |  |
| 7 | Create a database object, TABLE (Employee), with the following attributes and constraints. Create the constraints at the *table* level   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | SNo | Column Name | Data Type | Length | Constraint | Remarks | | 1 | Emp\_Id | NUMBER | 8 | NOT NULL | Employee Id. PK | | 2 | Emp \_FName | VARCHAR | 25 | NOT NULL | Employee First Name | | 3 | Emp\_LName | VARCHAR | 25 | NOT NULL | Employee Last Name | | 4 | Emp\_Salary | NUMBER | 10,2 | NOT NULL | Employee Salary | | 5 | Emp\_Mgr\_Id | NUMBER | 8 | NULL | Employee Manager Id | | 6 | Emp\_Dept | VARCHAR | 15 | NOT NULL | Employee Department | | 7 | Emp\_Job | VARCHAR | 15 | NOT NULL | Employee Designation | | 8 | Emp\_Join\_Date | DATE |  | NOT NULL | Employee Join Date | | 9 | Emp\_Gender | CHAR | 1 | NOT NULL | Employee Gender | | 10 | Bran\_Id | NUMBER | 8 | NOT NULL | Foreign Key | |  | Create PK and FK for the table after defining all columns | | | | | |  |
| 8 | * Change the structure of the TABLE,Organization to *add* a new column named’Orgn\_Regn\_No’. Data type – VARCHAR, Length 50, NULL * Change the structure of the TABLE,Organization to *add* a new column named ‘Orgn\_Address’. Data type – VARCHAR, Length 50, NULL * Change the structure of the TABLE,Organization to *add* a new column named ‘Orgn\_Web\_Site’. Data type – VARCHAR, Length 50, NULL * Change the structure of the TABLE,Organization to *add* a new column named ‘Orgn\_Email’. Data type – VARCHAR, Length 50, NULL * Change the structure of the TABLE,Organization to *add* a new column named ‘Orgn\_Start\_Date’. Data type – DATE, NOT NULL. Set the default value as sysdate * Change the structure of the TABLE,Organization to *modify* the column named’Orgn\_Business’. Data type – VARCHAR, Length 50, NOT NULL * Change the structure of the TABLE,Organization to *modify* the column named’Orgn\_Reg\_No’. Data type – VARCHAR, Length 30, NOT NULL * Change the structure of the TABLE,Organization to *modify* the column named’Orgn\_Phone\_No’. Data type – NUMBER, Length 15, NOT NULL * Change the structure of the TABLE,Organization to *drop* the column named ‘Orgn\_Web\_Site’ * Change the structure of the TABLE,Organization to *drop* the column named ‘Orgn\_Email’   *Final structure of the table, Organization is as follows*   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | SNo | Column Name | Data Type | Length | Constraint | Remarks | | 1 | Orgn\_Id | NUMBER | 8 | NOT NULL, PK | Organization Id | | 2 | Orgn\_Name | VARCHAR | 50 | NOT NULL, UNIQUE | Organization Name | | 3 | Orgn\_Regn\_No | VARCHAR | 30 | NOT NULL | Organization Registration Details | | 4 | Orgn\_CEO | VARCHAR | 25 | NULL | Organization Chairman | | 5 | Orgn\_Business | VARCHAR | 50 | NOT NULL, CHECK | Type of business of organization | | 6 | Orgn\_Address | VARCHAR | 50 | NULL | Organization address | | 7 | Orgn\_Contact | VARCHAR | 25 | NULL | Organization contact person | | 8 | Orgn\_Phone\_No | NUMBER | 15 | NULL | Organization phone number | | 9 | Orgn\_Start\_Date | DATE |  | NULL | Organization start date | |  |
| 9 | * Add a primary key constraint to the table, Division for the column, Divn\_Id * Add a foreign key constraint to the table, Division for the column, Orgn\_Id * Add a UNIQUE constaint to the table, Division for the column, Divn\_Phone\_No * Drop the primary key constraint for the table, Branch * Drop the foreign key constraint for the table, Branch * Add a primary key constraint to the table, Branch for the column, Bran\_Id * Add a foreign key constraint to the table, Branch for the column, Divn\_Id * Add a CHECK constraint to the table, Branch for the column, Bran\_Total\_Emp so that it is greater than zero always * Add a CHECK constraint to the table, Employee for the column, Emp\_Salary so that it is greater than zero always * Add a CHECK constraint to the table, Employee for the column, Emp\_Dept so that user can enter only values ‘Finance', ‘Human Resource’, ‘Purchase’, ‘Logistics’, ‘Sales & Marketing’, ‘Management’, ‘Operation’ * Change the structure of the TABLE,Employee for the column named ‘Emp\_Join\_Date’. Set the default value as sysdate * Add a CHECK constraint to the table, Employee for the column, Emp\_Gender so that user can enter only values ‘M’ or ‘F’ |  |
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| 9 | Create a database object, TABLE (Organization / Company), with the following attributes and constraints based on ER Diagram 2. *Do not create the table. It has been aleady created*   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | SNo | Column Name | Data Type | Length | Constraint | Remarks | | 1 | Orgn\_Id | NUMBER | 8 | NOT NULL, PK | Organization Id | | 2 | Orgn\_Name | VARCHAR | 50 | NOT NULL, UNIQUE | Organization Name | | 3 | Orgn\_Regn\_No | VARCHAR | 30 | NOT NULL | Organization Registration Number | | 4 | Orgn\_CEO | VARCHAR | 25 | NULL | Organization Chairman | | 5 | Orgn\_Business | VARCHAR | 50 | NOT NULL, CHECK | Type of business of organization | | 6 | Orgn\_Address | VARCHAR | 50 | NULL | Organization address | | 7 | Orgn\_Contact | VARCHAR | 25 | NULL | Organization contact person | | 8 | Orgn\_Phone\_No | NUMBER | 15 | NOT NULL | Organization phone number | | 9 | Orgn\_Start\_Date | DATE |  | NOT NULL | Organization start date | |  |
| 10 | Create a database object, TABLE (Department), with the following attributes and constraints based on ER Diagram 2 .   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | SNo | Column Name | Data Type | Length | Constraint | Remarks | | 1 | Dept\_Id | NUMBER | 8 | NOT NULL, PK | Department Id | | 2 | Dept \_Name | VARCHAR | 50 | NOT NULL | Department Name | | 3 | Dept\_Head | VARCHAR | 30 | NULL | Department Head | | 4 | Dept \_ Extn\_No | NUMBER | 8 | NULL | Department Intercomm Number | | 5 | Dept\_ Location | VARCHAR | 50 | NULL | Department Location | |  |
| 11 | * Change the structure of the TABLE,Department to *add* a new column named’Orgn\_Id’. Data type – NUMBER, Length 8, NOT NULL * Add a foreign key constraint to the table, Department for the column, ‘Orgn\_Id’ * Change the structure of the TABLE, Employee to *drop* the column named ‘Emp\_Dept’ * Change the structure of the TABLE,Employee to *add* a new column named’Dept\_Id’. Data type – NUMBER, Length 8, NOT NULL * Add a foreign key constraint to the table, Employee for the column, ‘Dept\_Id’   *Final structure of the table, Department is as follows*   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | SNo | Column Name | Data Type | Length | Constraint | Remarks | | 1 | Dept\_Id | NUMBER | 8 | NOT NULL, PK | Department Id | | 2 | Dept \_Name | VARCHAR | 50 | NOT NULL | Department Name | | 3 | Dept\_Head | VARCHAR | 30 | NULL | Department Head | | 4 | Dept \_ Extn\_No | NUMBER | 8 | NULL | Department Intercomm Number | | 5 | Dept\_ Location | VARCHAR | 50 | NULL | Department Location | | 6 | Orgn\_Id | NUMBER | 8 | NOT NULL, FK | Organization Id |   *Final structure of the table, Employee is as follows*   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | SNo | Column Name | Data Type | Length | Constraint | Remarks | | 1 | Emp\_Id | NUMBER | 8 | NOT NULL | Employee Id. PK | | 2 | Emp \_FName | VARCHAR | 25 | NOT NULL | Employee First Name | | 3 | Emp\_LName | VARCHAR | 25 | NOT NULL | Employee Last Name | | 4 | Emp\_Salary | NUMBER | 10,2 | NOT NULL | Employee Salary | | 5 | Emp\_Mgr\_Id | NUMBER | 8 | NULL | Employee Manager Id | | 6 | Dept\_Id | NUMBER | 8 | NOT NULL FK | Department Id | | 7 | Emp\_Job | VARCHAR | 15 | NOT NULL | Employee Designation | | 8 | Emp\_Join\_Date | DATE |  | NULL | Employee Join Date | | 9 | Emp\_Gender | CHAR | 1 | NOT NULL | Employee Gender | | 10 | Bran\_Id | NUMBER | 8 | NOT NULL | Foreign Key | |  |
| 12 | Create a database object, TABLE (Dependent), with the following attributes and constraints based on ER Diagram 2. Create the constraints at the *table* level   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | SNo | Column Name | Data Type | Length | Constraint | Remarks | | 1 | Dpen\_Id | NUMBER | 8 | NOT NULL, PK | Dependent Id | | 2 | Dpen \_Name | VARCHAR | 50 | NOT NULL | Dependent Name | | 3 | Dpen\_Relationship | VARCHAR | 30 | NULL | Dependent Relationship | | 4 | Dpen\_Gender | CHAR | 1 | NOT NULL, CHECK | Dependent Gender – ‘M’ or ‘F’ | | 5 | Dpen\_DOB | DATE |  | NULL, Default sysdate | Dependent date of birth | | 6 | Emp\_Id | NUMBER | 8 | NOT NULL, PK,FK | Employee Id | |  | Create a compound PK for the table based on columns, Emp\_Id & Dpen\_Id | | | | | |  |
| 12 | Create a database object, TABLE (Employee History, Emp\_History), with the following attributes and constraints based on ER Diagram 2. Create the constraints at the *table* level   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | SNo | Column Name | Data Type | Length | Constraint | Remarks | | 1 | Emp\_Hist\_Id | NUMBER | 8 | NOT NULL, PK | History Id | | 2 | Emp\_Hist\_Desc | VARCHAR | 50 | NOT NULL | History Description | | 3 | Emp\_Hist\_Date | DATE |  | NOT NULL, Default sysdate | Date of creation of history | | 4 | Emp\_Id | NUMBER | 8 | NOT NULL, PK,FK | Employee Id | |  | Create a compound PK for the table based on columns, Emp\_Id & Emp\_Hist\_Id | | | | | |  |
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| 13 | Create a database object, TABLE (Doctor), with the following attributes. *(Not related to ER Diagram – Additional exercise)* Create the constraints at the *table* level   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | SNo | Column Name | Data Type | Length | Constraint | Remarks | | 1 | Doct\_Id | NUMBER | 8 | NOT NULL, PK | Doctor Id | | 2 | Doct\_Name | VARCHAR | 50 | NOT NULL | Doctor Name | | 3 | Doct\_Address | VARCHAR | 50 | NULL | Doctor Address | | 4 | Doct\_City | VARCHAR | 50 | NULL | Doctor City | |  | Create PK for the table after defining all columns | | | | | |  |
| 13 | Create a database object, TABLE (Hospital), with the following attributes. *(Not related to ER Diagram – Additional exercise)* Create the constraints at the *table* level   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | SNo | Column Name | Data Type | Length | Constraint | Remarks | | 1 | Hosp\_Id | NUMBER | 8 | NOT NULL, PK | Hospital Id | | 2 | Hosp\_Name | VARCHAR | 50 | NOT NULL | Hospital Name | | 3 | Hosp\_Street | VARCHAR | 50 | NULL | Hospital Street | | 4 | Hosp\_City | VARCHAR | 50 | NULL | Hospital City | |  | Create PK for the table after defining all columns | | | | | |  |
| 14 | Create a database object, TABLE (Visit), with the following attributes. *(Not related to ER Diagram – Additional exercise)* Create the constraints at the *table* level   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | SNo | Column Name | Data Type | Length | Constraint | Remarks | | 1 | Doct\_Id | NUMBER | 8 | NOT NULL, PK | Doctor Id | | 2 | Hosp\_Id | VARCHAR | 50 | NOT NULL,PK | Hospital Id | | 3 | Visit\_Date | DATE |  | NOT NULL, Default Sysdate | Visit Date | |  | Create PK for the table after defining all columns | | | | | |  |
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| 15 | **1** | Create a database object, TABLE (Designation), with the following attributes and constraints based on ER Diagram 5. (***Before proceed with the exercise, ask the lab instructor. Very important***)   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | SNo | Column Name | Data Type | Length | Constraint | Remarks | | 1 | Desn\_Id | NUMBER | 8 | NOT NULL, PK | Designation Id | | 2 | Desn \_Name | VARCHAR | 50 | NOT NULL | Designation Name | | 3 | Desn\_Low\_Salary | NUMBER | 8 | NULL | Designation Low Salary | | 4 | Desn\_High\_Salary | NUMBER | 8 | NULL | Designation Low Salary | | 5 | Desn\_Grade | CHAR | 5 | NULL | Designation Grade |   Follow and execute the steps carefully   * Create a database object, TABLE (Designation) with ONLY ONE column named, ‘Desn\_Name’ as follows * CREATE TABLE Designation AS SELECT DISTINCT Emp\_Job AS Desn\_Name FROM Employee * ALTER TABLE Designation ADD (Desn\_Id NUMBER, Desn\_Low\_Salary NUMBER, Desn\_High\_Salary NUMBER, Desn\_Grade CHAR(5) ) * **…………..***See the demo* * Change the structure of the TABLE,Employee to *drop* the column named ‘Emp\_Job’ * Add a foreign key constraint to the table, Employee for the column, Desn\_Id * Add a foreign key constraint to the table, Division for the column, Orgn\_Id * Update the table, Employee for the column, Desn\_Id with the value (Check the Employee data file, ‘Emp\_Data.txt’) * Change the structure of the TABLE,Employee to *add* a new column named’Emp\_Comm’. Data type – NUMBER, Length (8,2) , NULL |  |
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| 15 | **1** | Create a database object, TABLE (Person), with the following attributes. *(Not related to ER Diagram – Additional exercise)* Create the constraints at the *table* level   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | SNo | Column Name | Data Type | Length | Constraint | Remarks | | 1 | Person\_Id | NUMBER | 8 | NOT NULL, PK | Person Id | | 2 | Person \_Name | VARCHAR | 50 | NOT NULL | Person Name | | 3 | Person\_Join\_Date | DATE |  | NOT NULL | Person Join Date | | 4 | Person\_Age | NUMBER | 8 | NOT NULL | Person Age | | 5 | Person\_Marital\_Status | VARCHAR | 1 | NOT NULL | Marital Status | | 6 | Person\_ Gender | VARCHAR | 1 | NOT NULL | Person  Gender | | 7 | Person\_Dept | VARCHAR | 4 | NOT NULL | Department | |  | Create PK for the table after defining all columns | | | | | |  |
| 15 | **1** | * Update the columns, organization contact (person name or receptionist) and start date for all organizations. Year of the organization stat date is to be from 1998 to 2005 * Update division contact (person name) of all divisions whose division ID is from 11 to 15 * Update the branch contact of all branches same as division contact * Update the branch head of all branches whose id is 110 / 131 / 171 * Update the employee join date for all employees. Year of the join date is to be from 2002 to 2015 |  |