

POSTAL Book Package

2023

Computer Science & IT

Objective Practice Sets

Databases

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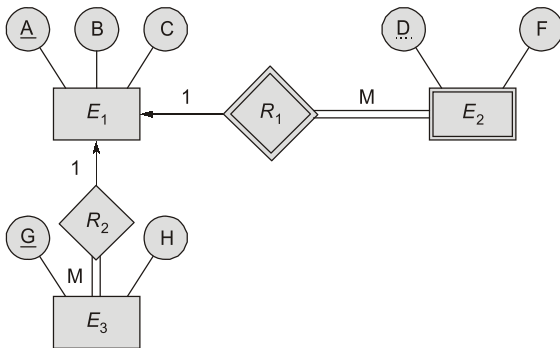
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The Relational Model

Multiple Choice Questions & NAT Questions

1. Consider the following ER-diagram:

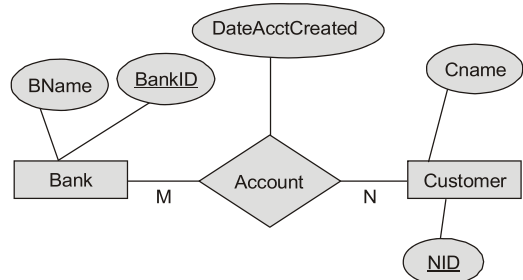


The minimum number of tables needed to represent E_1 , E_2 and E_3 are _____.

2. A weak entity _____.
 (a) is an entity with no attributes beside its key.
 (b) inherits part of its key from the 'parent' entities to which it is related.
 (c) is an entity with no key.
 (d) None of these.
3. In the Relational Model, the number of attributes and number of tuples in a relation are termed as _____ and _____ respectively.
 (a) Cardinality, domain
 (b) Degree, cardinality
 (c) Domain, degree
 (d) Cardinality, degree
4. An ER model of a database consists of entity types A and B. These are connected by a relationship R which does not have its own attribute. Under which one of the following conditions, can the relational table for R be merged with that of A?
 (a) Relationship R is one-to-many and the participation of A in R is total.
 (b) Relationship R is one-to-many and the participation of A in R is partial.

- (c) Relationship R is many-to-one and the participation of A in R is total.
 (d) Relationship R is many-to-one and the participation of A in R is partial.

5. In an Entity-Relationship (ER) model, suppose R is a many-to-one relationship from entity set E1 to entity set E2. Assume that E1 and E2 participate totally in R and that the cardinality of E1 is greater than the cardinality of E2.
 Which one of the following is true about R?
 (a) Every entity in E1 is associated with exactly one entity in E2.
 (b) Some entity in E1 is associated with more than one entity in E2.
 (c) Every entity in E2 is associated with exactly one entity in E1.
 (d) Every entity in E2 is associated with at most one entity in E1.
6. Consider the following ERD diagram illustrating the relationship of customers and banks.

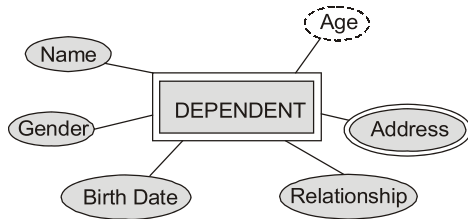


Select from among the following, candidates for relations, if the above ERD is mapped into a relational model.

- Customer(NID, CName)
- Account(DateAcctCreated, BName, CName)
- Bank(BankID, NID, BName)
- Bank(BankID, BName)
- Account(BankID, NID, DateAccCreated)

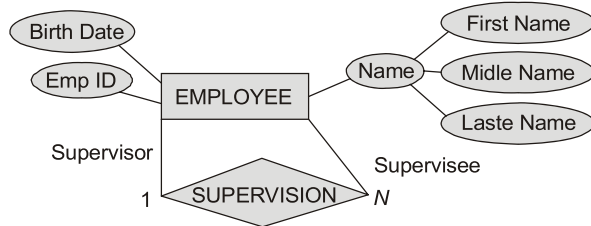
- (a) 1, 2 and 4 (b) 1, 4 and 5
(c) 1, 3 and 5 (d) 1, 2 and 4

7. The following diagram represents the dependent entity from an Entity Relationship diagram.



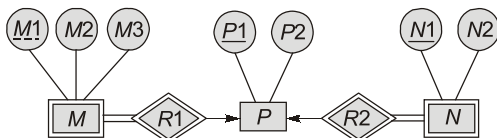
Select the characteristics which are not represented by the above diagram.

- (a) Age is a derived attribute
(b) Gender is an atomic attribute
(c) Address is a multivalued attribute
(d) Name is a key attribute
8. Consider the following ERD diagram depicting the relationship of an employee and supervisor.



Which is the possible relations if the above ERD is mapped into a relational model?

- (a) Employee (EmpID, BirthDate, Salary, Name(FirstName, MiddleName, LastName))
(b) Supervision (EmpID, BirthDate, Salary, Name(FirstName, MiddleName, LastName), EmpID)
(c) Supervisor (SupervisorID, BirthDate, Salary, Name(FirstName, MiddleName, LastName), EmpID, {EmpID})
(d) Employee (EmpID, BirthDate, Salary, Name(FirstName, MiddleName, LastName), SupervisorID)
9. Consider the following ER diagram:



The minimum number of table needed to represent $M, N, P, R1, R2$ is

- (a) 2 (b) 3
(c) 4 (d) 5

10. Match List-I with List-II and select the correct answer using the codes given below the lists:

List-I	List-II
A.	1. Identifying relationship
B.	2. Weak entity
C.	3. Derived attribute
D.	4. Multivalued attribute

Codes:

	A	B	C	D
(a)	1	3	4	2
(b)	2	4	3	1
(c)	2	3	4	1
(d)	1	4	3	2

11. Given the basic ER and relational models, which of the following is INCORRECT?

- (a) An attribute of an entity can have more than one value
(b) An attribute of an entity can be composite
(c) In a row of a relational table, an attribute can have more than one value
(d) In a row of a relational table, an attribute can have exactly one value or a NULL value

12. Consider an Entity-Relationship (ER) model in which entity sets E_1 and E_2 are connected by an $m : n$ relationship R_{12} . E_1 and E_3 are connected by a $1 : n$ (1 on the side of E_1 and n on the side of E_3) relationship R_{13} .

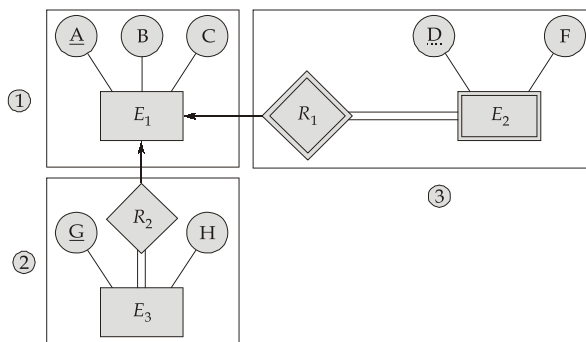
E_1 has two single-valued attributes a_{11} and a_{12} of which a_{11} is the key attribute. E_2 has two single-valued attributes a_{21} and a_{22} of which a_{21} is the key attribute. E_3 has two single-valued attributes a_{31} and a_{32} of which a_{31} is the key attribute. The relationships do not have any attributes.

Answers The Relational Model

1. (3) 2. (c) 3. (b) 4. (c) 5. (a) 6. (b) 7. (d) 8. (d) 9. (a)
 10. (c) 11. (c) 12. (4) 13. (b) 14. (50) 15. (5) 16. (b) 17. (a) 18. (3)
 19. (b, d) 20. (a, b, d) 21. (a, c, d)

Explanations The Relational Model

1. (3)



$R_1(\underline{A}, B, C, G), R_2(\underline{G}, H), R_3(\underline{D}, F, A)$
 Only 3 tables are required.

2. (c)

A weak entity is an entity which depends on some other entity and having no key.

3. (b)

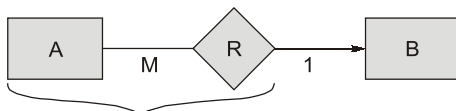
Number of attributes are called as degree while number of tuples are called as cardinality.

4. (c)

Entity sets A, B

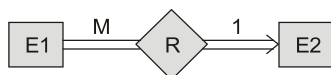
Relationship set R

Relation R merges with that of A.

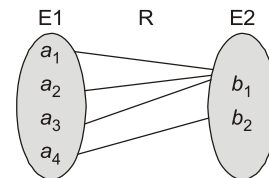


- Many to one relationship set can merge towards entity set 'A'.
- Participation towards A side can be total/ partial.

5. (a)

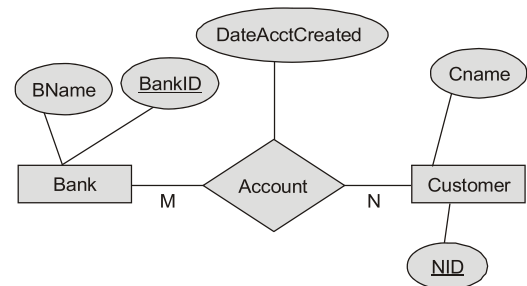


E1 entries > E2 entities



Every entity in E1 is associated with exactly one entity in E2.

6. (b)



Above ER diagram showing many to many relationship. Thus, a separate table is needed for relationship. Hence, 3 tables required i.e.,

1. Bank (BankID, BName)
2. Customer (NID, Cname)
3. Account (BankID, NID, DateAccCreated)

7. (d)

Dependent is a weak entity.

Age is a derived attribute since, inside dotted oval.

Gender is an atomic since under solid oval.

Address is multivalued attribute because it is double oval.

Name is not a key attribute since no underline.

8. (d)

The given ERD shows the self recursively relationship among Employees.

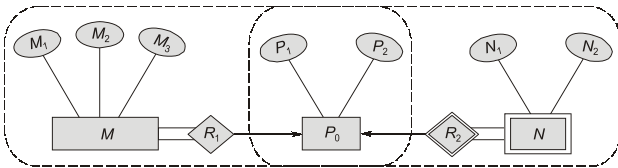
1 is supervisor 2 is supervisee.

The possible relation is

Employee (Emp Id, Birthdate, Salary, Name (First Name, Middle Name, Last Name), Supervisor Id)

9. (a)

Minimum number of tables needed is 2 as



1st table have the relation between M and P and
2nd table as P and N .

Hence option (a) is correct.

10. (c)



= Weak entity



= Derived attribute



= Multivalued attribute



= Identifying relationship

11. (c)

Option (a) is correct as there are multivalued attribute e.g. phone no (attribute)

Option (b) is also correct.

Option (d) 'Null' values are allowed in a row of relational database (Null value arc constraints only for primary keys).

As in 1NF also we remove multivalued attribute.

∴ Option (c) is incorrect.

12. (4)

For E_1 relation: $\langle a_{11}, a_{12} \rangle$

For E_2 relation: $\langle a_{21}, a_{22} \rangle$

For E_3 and R_{13} relationship: $\langle a_{31}, a_{32}, a_{11} \rangle$

For R_{12} : $\langle a_{11}, a_{21} \rangle$

13. (b)

If E_1 is merged with R it contains 70% NULL values.

If E_2 is merged with R it contains 30% NULL values.

Merging which gives less number of Null value is preferred.

E_1 and E_2 can't be merged into a single table because $E_1 R E_2$ has NO primary key

14. (50)

For relationship set R candidate and E_1 candidate key is same because between E_1 to E_3 , E_1 to E_2 and E_1 to E_4 there is one to many relationship.

15. (5)

The RDBMS tables that are need to be drawn will be:

(i) $E_3 R_2$ which have 'A' as its candidate key.

(ii) $E_2 R_4$ which have 'D' as its candidate key.

(iii) $E_1 R_3$ which have 'D' as its candidate key.

(iv) R_1 which has 'AD' as the candidate key.

(v) $E_3 P$; since P is a multi-valued attribute, which has 'A' as its candidate key.

16. (b)

Since, there is many to many relationship thus a separate table must be created for relationship.

Hence, 3 tables are needed except the one which is given in option (b).

17. (a)

Diamonds with double/bold border are used to represent a relationship for a weak entity set.

18. (3)

$E_1 R_1 (\underline{A} B C D)$

$E_2 (\underline{D} E F)$

$R_2 (\underline{A} D)$

So, minimum 3 relational tables are required.

19. (b, d)

Tables:

$XR(\underline{X1}, X2, X3, Y1)$

$SZ(\underline{Y1}, Z1, Z2)$

$Y(\underline{Y1}, Y2)$

Total 3 tables are required.