UNIVERSITY OF COLOMBO, SRI LANKA

UNIVERSITY OF COLOMBO SCHOOL OF COMPUTING

DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY (EXTERNAL)

Academic Year 2017 – 1st Year Examination – Semester 2

IT2305 – Database Systems I

Multiple Choice Question Paper

12th November, 2017

(TWO HOUR)

Important Instructions :

- The duration of the paper is **2 (two) hours**.
- The medium of instruction and questions is English.
- The paper has **45 questions** and **19 pages**.
- All questions should be answered.
- All questions are of the MCQ (Multiple Choice Questions) type.
- Each question will have 5 (five) choices with **one or more** correct answers.
- All questions will carry equal marks.
- There will be a penalty for incorrect responses to discourage guessing.
- The mark given for a question will vary from 0 (*All the incorrect choices are marked & no correct choices are marked*) to +1 (*All the correct choices are marked & no incorrect choices are marked*).
- Answers should be marked on the special answer sheet provided.
- Note that questions appear on both sides of the paper.
  If a page is not printed, please inform the supervisor immediately.
- Mark the correct choices on the question paper first and then transfer them to the given answer sheet which will be machine marked. **Please completely read and follow the instructions given on the other side of the answer sheet before you shade your correct choices.**
- Calculators are not allowed.

1) With respect to the ANSI/SPARC architecture, a database has

(a) More than one conceptual schema.
(b) Several physical schemas.
(c) Exactly one external schema.
(d) Exactly one conceptual schema.
(e) Several external schemas.

2) Which of the following is/are true for **indexed sequential files**?

(a) Records of the file can be processed sequentially.
(b) Records of the file can be accessed randomly.
(c) They are mostly used to access records via a secondary key.
(d) They can be maintained on a magnetic tape.
(e) Access to individual records is not as fast as that of direct files.

3) Which of the following statement(s) is/are correct with respect to DBMS languages?

(a) DDL provides operators to manipulate data in a database.

(b) DML provides operators to retrieve data in a database.

(c) Declarative DML has to specify which data in a database is to be retrieved and how to retrieve it.

(d) Declarative DML has to specify which data in a database is to be retrieved rather than how to retrieve it.

(e) SQL is a declarative DML.

4) Which of the following statements is/are characteristic(s) of 'Physical data Independence'?

(a) It hides the database file structure.
(b) It allows the change of indexes, without affecting applications.
(c) It allows changes to the physical storage structure, without affecting the applications.
(d) It insulates the physical storage from changes in the conceptual schema.
(e) It insulates the conceptual schema from changes in the physical storage.

5) Consider the following statements about sub-class and super-class relationships.

(i) A surrogate key is defined when creating a relation to correspond to the category.
(ii) Each super class is mapped to separate relations with their own primary keys.
(iii) Surrogate key will act as a foreign key in the subclass relations for super classes.

Which of the above statements is/are correct?

(a) (i) only
(b) (ii) only
(c) (ii) and (iii) only
(d) (i) and (ii) only
(e) (i), (ii) and (iii)

6) If a relation has 2 candidate keys, then

(a) One of the key attributes should be dropped from the database.
(b) One key becomes a primary key.
(c) One key becomes an alternate key.
(d) One becomes the primary key and other the index key.
(e) Both become composite keys.

7) Consider the following with respect to the database design process.

(i) Conceptual design is data model independent.

(ii) Logical design is DBMS dependent.

(iii) Physical design is DBMS dependent.

Which of the above is/are correct?

(a) (i) only
(b) (ii) only
(c) (i) and (ii) only
(d) (i) and (iii) only
(e) (i), (ii) and (iii)

8) Which of the following commands is/are in the Data Manipulation Language (DML).

(a) CREATE
(b) GRANT
(c) DROP
(d) INSERT
(e) DELETE

9) Which of the following statements is/are correct with respect to *referential integrity*.

(a) Referential integrity constraints check whether the primary key values are unique.
(b) Referential integrity constraints are specified between two relations in a schema.
(c) Referential integrity constraints are specified between entities having recursive relationships.
(d) Referential integrity constraints check whether an attribute value lies in the given range.
(e) When Referential integrity rules are enforced, a tuple in one relation that refers to another relation must refer to an existing tuple.

Consider the following scenario to answer questions from (10) – (13)

> Cosmetic companies produce cosmetics and trade names identify each cosmetic uniquely with respect to each cosmetic company. Each cosmetic has a fixed price. Shops sell several cosmetics. A cosmetic of a company could be sold at several shops at the same fixed price. A cosmetic company can have contracts with several shops, and a shop can have contracts with several cosmetic companies. Each contract should have a start date, an end date and the details of the contract.

10) In an Entity Relationship diagram for the above scenario, how could the contract be represented?

(a) As a weak entity and the cosmetic company as its owner

(b) As a weak entity which has the shop entity as its owner

(c) As a relationship between shop and cosmetic company entities

(d) As an associative entity between shop and cosmetic company entities

(e) As a composite attribute of the relationship between the shop and the cosmetic company entities

11) Based on the scenario, what is/are the best way(s) to represent the price of a cosmetic?

(a) As an attribute of shop.

(b) As an attribute of the relationship between shop and cosmetic.

(c) As an attribute of the relationship between shop and cosmetic company.

(d) As an attribute of cosmetic.

(e) As an attribute of cosmetic company.

12) Based on the scenario if it is necessary to maintain the price history of each cosmetic along with the effective date of each price, which of the following statement(s) is/are correct?

(a) Effective date could be added as an attribute of cosmetic company.

(b) Effective date could be added as a multivalued attribute of cosmetic.

(c) Price history could be maintained as a composite attribute of cosmetic company with the component attributes price and effective date.

(d) Price history could be maintained as a multivalued composite attribute of cosmetic with the component attributes price and effective date.

(e) Price history could be represented as a weak entity of the cosmetic entity with attributes price and effective date.

13) If the price of each cosmetic varies from shop to shop, how would the price be represented?

(a) As an attribute of cosmetic.
(b) As an attribute of the relationship between shop and cosmetic.
(c) As an attribute of the relationship between shop and cosmetic company.
(d) As an attribute of shop.
(e) As an attribute of cosmetic company.

14) Consider the following SQL functions.

(i) ROUND(10.75)

(ii) TRUNC(13.53)

(iii) TRIM('computer',2)

(iv) UPPER('database')

(v) YEAR('15/06/2017')

What are the correct outputs of these SQL functions?

(a) (i) 10.7 (ii) 13 (iii) computer2 (iv) DATABASE (v) 17
(b) (i) 10.8 (ii) 14 (iii) comput (iv) database (v) 2017
(c) (i) 11 (ii) 13 (iii) co (iv) DATABASE (v) 2017
(d) (i) 10 (ii) 14 (iii) computer (iv) DATABASE (v) 17
(e) (i) 11 (ii) 13 (iii) co (iv) database (v) 17

15) Consider the following five tasks

(i) Adding a column

(ii) Removing a table from the database

(iii) Defining an index on a column

(iv) Adding a row to a table

(v) Changing data in one or more rows in a table

Which SQL command(s) has/have to be used respectively to accomplish the above five tasks?

(a) (i) INSERT (ii) DROP (iii) DELETE (iv) UPDATE (v) CREATE TABLE
(b) (i) ALTER (ii) DROP (iii) INSERT (iv) UPDATE (v) CREATE VIEW
(c) (i) INSERT (ii) DELETE (iii) ALTER (iv) UPDATE (v) CREATE INDEX
(d) (i) ALTER (ii) DROP (iii) CREATE INDEX (iv) INSERT (v) UPDATE
(e) (i) ALTER (ii) DROP (iii) UPDATE (iv) INSERT (v) CREATE TABLE

16) This question is based on the relations *Employee* and *Supervisor* given below. Please note that Fname and Lname have the same data types as the First Name and Last Name respectively.

Employee

First Name	**Last Name**
Isuru	Gamage
Geethika	Senerath
Anupa	Shamlal
Oshan	Thennakoon
Nimali	Wasana
Waruni	Samarasinghe
Susanthi	Gamage

Supervisor

Fname	**Lname**
Isuru	Gamage
Geethika	Senerath
Anupa	Shamlal

Which of the following statement(s) is/are correct about the above two relations.

(a) The two relations are not union-compatible since their attribute names differ.

(b) The two relations are union-compatible since they have the same type of tuples.

(c) To find out those Employees who are also Supervisors, it is necessary to perform the operation Employee ∪ Supervisor.

(d) To find out those Employees who are also Supervisors, it is necessary to perform the operation Employee ∩ Supervisor.

(e) To find out the Employees who are not Supervisors, it is necessary to perform the operation Employee ÷ Supervisor.

17) Which of the following statement(s) is/are correct?

(a) A database recovery process implies two or more transactions request access to the same database record at about the same time.

(b) Concurrent processing implies a restoring process of a database to its correct state which has been corrupted due to a malfunction.

(c) Data integrity implies maintaining the accuracy and consistency of data stored in a database system.

(d) A condition or restriction that is applied to a particular set of data is commonly termed as integrity control.

(e) Data security refers to protecting a database system from unauthorized and malicious use.

18) During the 'physical database design' stage, which of the following should be considered when choosing a data type?

(a) Storage cost
(b) All possible values
(c) Data integrity
(d) Data manipulations
(e) Field name

19) Consider the following SQL table declarations for three tables T1, T2, and T3.

```
CREATE TABLE T1 (A INT PRIMARY KEY);

CREATE TABLE T2 (B INT PRIMARY KEY, FOREIGN KEY (B) REFERENCES T1(A)  on
UPDATE CASCADE);

CREATE TABLE T3 (C INT PRIMARY KEY, FOREIGN KEY (C) REFERENCES T2(B) on
UPDATE CASCADE);
```

Let the initial contents of the tables be:

T1 (A) = {(1), (2), (3), (4), (5), (6)}
T2 (B) = {(1), (2), (4), (6)}
T3(C) = {(1), (2), (6)}

Suppose the following SQL modification command is executed.

```
UPDATE T1 SET A = A + 10 WHERE A < 5;
```

If the following command is executed subsequently, what would be the result?

```
SELECT SUM(C) FROM T3;
```

(a) 29
(b) 9
(c) 50
(d) 39
(e) 23

Consider the following Company schema to answer the questions from (20) to (23). Primary Keys are underlined and Foreign Keys are in Bold italics. Supervisors can guide projects which belongs to other departments as well.

Employee (EmpNo, Name, Gender, Salary, Category, ***DNo***).
Department (DNo, Dname, ***HeadEmpNo***)
Project (PNo, Pname, Budget, ***DNo***)
Guide (EmpNo, ***PNo***, Hours)
Loans (LName, ***EmpNo***, Amount)

The symbols π, σ, ⋈, ⟕ ,⟖ , U, ∩ , – and ÷ are used to denote the relational operators Projection, Selection, Natural Join, Right Outer Join, Left Outer Join, Union, Intersection, Set difference and Division respectively.

20) Consider the following operation on the Project relation.

$$RESULT1 \leftarrow \pi_{PNo}(\sigma_{DNo=3}(Project))$$

What would be in RESULT1 after the above operation is performed?

(a) Names of the projects belonging to department No.3
(b) Names of the projects not belonging to department No.3
(c) Project numbers belonging to department No.3
(d) Project names and project numbers belonging to department No.3
(e) Project numbers not belonging to department No.3

21) Which of the following sequence(s) of operations would list the names of department heads who have at least one Loan?

(a) $HEADS(EmpNo) \leftarrow \pi_{HeadEmpNo}(Department)$
$RESULT1 \leftarrow \pi_{EmpNo}(Loans)$
$RESULT2 \leftarrow RESULT1 \cap HEADS$
$RESULT \leftarrow \pi_{Name}(RESULT2 \bowtie_{EmpNo=EmpNo} Employee)$

(b) $HEADS(EmpNo) \leftarrow \pi_{HeadEmpNo}(Department)$
$RESULT1 \leftarrow \pi_{EmpNo}(Loans)$
$RESULT2 \leftarrow RESULT1\ U\ HEADS$
$RESULT \leftarrow \pi_{Name}(RESULT2 \bowtie_{EmpNo=EmpNo} Employee)$

(c) $HEADS(EmpNo) \leftarrow \pi_{HeadEmpNo}(Department \bowtie_{EmpNo=EmpNo} Loans)$
$RESULT \leftarrow \pi_{Name}(HEADS \bowtie_{EmpNo=EmpNo} Employee)$

(d) $HEADS(EmpNo) \leftarrow \pi_{HeadEmpNo}(Department)$
$RESULT1 \leftarrow \pi_{EmpNo}(Loans)$
$RESULT2 \leftarrow RESULT1 - HEADS$
$RESULT \leftarrow \pi_{Name}(RESULT2 \bowtie_{EmpNo=EmpNo} Employee)$

(e) $HEADS(EmpNo) \leftarrow \pi_{HeadEmpNo}(Department)$
$RESULT1 \leftarrow \pi_{EmpNo}(Loans)$
$RESULT2 \leftarrow RESULT1 \bowtie_{EmpNo=HeadEmpNo} HEADS$
$RESULT \leftarrow \pi_{Name}(RESULT2 \bowtie_{EmpNo=EmpNo} Employee)$

22) Which of the following sequence(s) of operations would produce the EmpNo, Name and Category of all the Employees and the department name if the employee is a head of a department.

(a) $\pi_{EmpNo,\ Name,\ Category,\ Dname}(Employee \bowtie_{EmpNo=HeadEmpNo} Department)$
(b) $\pi_{EmpNo,\ Name,\ Category,\ Dname}(Employee \bowtie_{DNo=DNo} Department)$
(c) $\pi_{EmpNo,\ Name,\ Category,\ Dname}(Employee \bowtie_{EmpNo=HeadEmpNo} Department)$
(d) $\pi_{EmpNo,\ Name,\ Category,\ Dname}(Employee \bowtie_{EmpNo=HeadEmpNo} Department)$
(e) $\pi_{EmpNo,\ Name,\ Category,\ Dname}(Employee \bowtie_{DNo=DNo} Department)$

23) Which of the following sequence(s) of operations would find the names of employees who have no loans?

(a) $RES1 \leftarrow \pi_{EmpNo}(Loans)$
$RESULT \leftarrow \pi_{Name}(Employee - RES1)$

(b) $RES1 \leftarrow \pi_{EmpNo,\ Name}(Employee)$
$RES2 \leftarrow \pi_{EmpNo}(Loans)$
$RESULT \leftarrow (RES1 - RES2)$

(c) $RES1 \leftarrow \pi_{EmpNo,\ Name}(Employee)$
$RES2 \leftarrow \pi_{EmpNo}(Loans)$
$RESULT \leftarrow (RES1 \div RES2)$

(d) $RES1 \leftarrow \pi_{EmpNo}(Employee)$
$RES2 \leftarrow \pi_{EmpNo}(Loans)$
$RES3 \leftarrow (RES1 - RES2)$
$RESULT \leftarrow \pi_{Name}(RES3 \bowtie_{EmpNo=EmpNo} Employee)$

(e) $RES1 \leftarrow \pi_{EmpNo}(Loans)$
$RES2 \leftarrow \pi_{EmpNo}(Employee)$
$RES3 \leftarrow (RES1 - RES2)$
$RESULT \leftarrow \pi_{Name}(RES3 \bowtie_{EmpNo=EmpNo} Employee)$

Consider the following Customer relation with the given attributes and data types to answer questions from (24) to (27). Assume that the attributes are stated in the order that they were specified in the create table statement. Total monthly payment is the difference between Payment and the Discount.

Customer (CusNo CHAR(03), Name VARCHAR(50), Payment REAL, Discount REAL, ManagerNo CHAR(03), Category VARCHAR(25), DateJoined DATE, DNo CHAR(02))

24) Which of the following SQL statement(s) display the name and annual payment for each customer?

(a) SELECT Name, (Payment - Discount) *12 FROM Customer;
(b) SELECT Name, (Payment - Discount) *12 as Annual Payment FROM Customer;
(c) SELECT Name, "Annual Payment" FROM Customer WHERE "Annual Payment" = Payment * 12 - Discount;
(d) SELECT Name , "Annual Payment" FROM Customer GROUP BY Name HAVING "Annual Payment" = Payment * 12 - Discount;
(e) SELECT Name, Payment - Discount as Annual Payment FROM Customer;

25) Which of the following SQL statement(s) would display all Customer's names and dates joined sorted by the ascending order of DateJoined?

(a) SELECT Name, DateJoined FROM Customer ORDER BY DateJoined;
(b) SELECT Name, DateJoined FROM Customer ORDER BY Name, DateJoined;
(c) SELECT Name, DateJoined FROM Customer SORT BY Name, DateJoined;
(d) SELECT Name, DateJoined FROM Customer SORT BY DateJoined;
(e) SELECT Name, DateJoined FROM Customer ORDER BY DateJoined ASC;

26) Consider the following details of a Customer. Note SYSDATE returns the current system date.
CusNo – 175, Name – Kamal Silva, Payment - 25,000, Discount – 10,000,
ManagerNo – 015, Category – Daily, DateJoined - SYSDATE, DNo – 05

Which of the following SQL statement(s) will insert the above data into Customer relation?

(a) INSERT INTO Customer
VALUES ('175', 'Kamal Silva', 25000, 10000, '015', 'Daily', SYSDATE, '05');

(b) INSERT INTO Customer (CusNo, Name, Payment, Discount, ManagerNo, Category ,DateJoined, DNo)
VALUES ('175', 'Kamal Silva', 25000, 10000, '015', 'Daily', SYSDATE, '05');

(c) INSERT INTO Customer (CusNo, Payment, Name, Discount, ManagerNo, Category ,DateJoined, DNo)
VALUES ('175', 25000, 'Kamal Silva', 10000, '015', 'Daily', SYSDATE, '05');

(d) INSERT INTO Customer
VALUES ('175', 'Kamal Silva', 'Daily', 25000, 10000, '015', SYSDATE, '05');

(e) INSERT (CusNo, Name, Payment, Discount, ManagerNo, Category, DateJoined, DNo)
VALUES ('175', 'Kamal Silva', 25000, 10000, '015', 'Daily', '05', SYSDATE)
INTO Customer;

27) Which of the following SQL statement(s) will decrease the Payment by Rs: 500/= from the customers who are categorized as *New*?

(a) UPDATE Customer SET Payment = Payment - 500 WHERE Category = 'New';
(b) UPDATE Payment SET Payment = Payment - 500
FROM Customer WHERE Category = 'New';
(c) UPDATE Customer SET Payment = Payment - 500 WHERE CusNo
IN (SELECT CusNo FROM Customer WHERE Category = 'New');
(d) UPDATE SET Payment - 500 FROM Customer WHERE Category = 'New';
(e) UPDATE SET Payment = Payment - 500 FROM Customer WHERE Category = 'New';

28) Suppose a relation is declared as follows:

```
CREATE TABLE Customers (Name VARCHAR(50) PRIMARY KEY,
 Payment INT CHECK(Payment <= 40,000) );
```

Initially, the relation has three records:

Name	Payment
Anupa	10000
Isuru	20000
Roshan	30000

Assume that the following sequence of SQLs are executed on this table. Some of them may be rejected due to the constraints defined on the relation.

(i) INSERT INTO Customers VALUES ('Oshan', 12000);
(ii) UPDATE Customers SET Payment = 50000 WHERE Name = 'Roshan';
(iii) INSERT INTO Customers VALUES ('Anuradha', 13000);
(iv) DELETE FROM Customers WHERE Name = 'Isuru';

After the execution of the above SQL statements, the sum of the Payments over all the tuples in Customers relation would be:

(a) 52,000
(b) 62,000
(c) 65,000
(d) 72,000
(e) 85,000

29) Consider the relation Lecturer (Lecid, NIC, Lname, Address, Salary) with the following functional dependencies

Lecid → NIC, Lname, Address, Salary
NIC → Lecid, Lname, Address, Salary

What is the best normal form that Lecturer relation satisfies?

(a) 0NF
(b) 1NF
(c) 2NF
(d) 3NF
(e) BCNF

30) The following "Employee" relation is part of a relational database schema.

Employee (name, address, designation, salary)

SQL statements have been written to do various tasks. Identify which SQL statement(s) will **not** produce the required results specified in the task.

(a) Task: Define a view to retrieve "Senior Lectures".

```
SQL: CREATE TABLE snr_lecturer (name, address, salary) AS
       (SLECT name, address, salary FROM Employee
       WHERE designation = 'senior lecturer');
```

(b) Task: Increase the salary of employees by 10% if the value of the designation is "Senior Lecturer".

```
SQL: UPDATE Employee SET salary = salary * 1.1
       WHERE designation = 'Senior Lecturer';
```

(c) Task: Insert the new employer "Anupa" from "Galle" as a "Lecturer" with salary of 8,5000.

```
SQL: INSERT INTO Employee
       VALUES ('Anupa', 'Galle', 'lecturer', 85000);
```

(d) Task: Delete the employee "Anupa".

```
SQL: DELETE Employee
       WHERE name = 'Anupa';
```

(e) Task: Retrieve the number of employees and their average salary for each job category.

```
SQL: SELECT COUNT (*), AVG (salary), designation
       FROM Employee GROUP BY designation;
```

31) A relational database system consists of the following tables.

Supplier (sno, sname, city)
Part (pno, pname, colour)
QtySupplied (sno, pno, Qty)

Which of the following SQL statement(s) will get supplier names for suppliers who had supplied at least one part with color “Green”.

(a) SELECT sname FROM Supplier S, Part P, QtySupplied SP

WHERE S.sno = SP.sno and P.pno = SP.pno and colour = 'Green';

(b) SELECT sname FROM Supplier

WHERE sno IN (SELECT sno FROM QtySupplied
WHERE pno IN (SELECT pno FROM Part WHERE colour = 'Green'));

(c) SELECT sname FROM Supplier

WHERE sno IN (SELECT SP.sno FROM QtySupplied SP

WHERE SP.pno IN (SELECT P.pno FROM Part P
WHERE colour = 'Green'));

(d) SELECT sname FROM Supplier

WHERE sno IN (SELECT SP.sno FROM QtySupplied SP, Part P
WHERE SP.pno = P.pno colour = 'Green');

(e) SELECT sname FROM Supplier S, Part P, QtySupplied SP

WHERE S.sno = SP.sno and P.pno = SP.pno
GROUP BY colour HAVING colour = 'Green';

32) A certain operation applied on relations A and B will result in relation C as shown below.

A

Sal_ID	Prod_ID
110	1035
123	2518
239	2241
239	2518
337	2249
110	2249
239	2249
239	1035

B

Prod_ID	Name
1035	Toffee
2241	Chocolate
2249	Biscuits
2518	Fruit juice

C

Sal_ID	Prod_ID	Name
110	1035	Toffee
123	2518	Fruit juice
239	2241	Chocolate
239	2518	Fruit juice
337	2249	Biscuits
110	2249	Biscuits
239	2249	Biscuits
239	1035	Toffee

Which of the following is/are the possible operation(s)?

(a) Projection

(b) Cartesian Product

(c) Selection

(d) Natural Join

(e) Union Operation

33) Which of the following SQL group functions ignore NULL values?

(i) MAX
(ii) COUNT
(iii) SUM

(a) (i) only

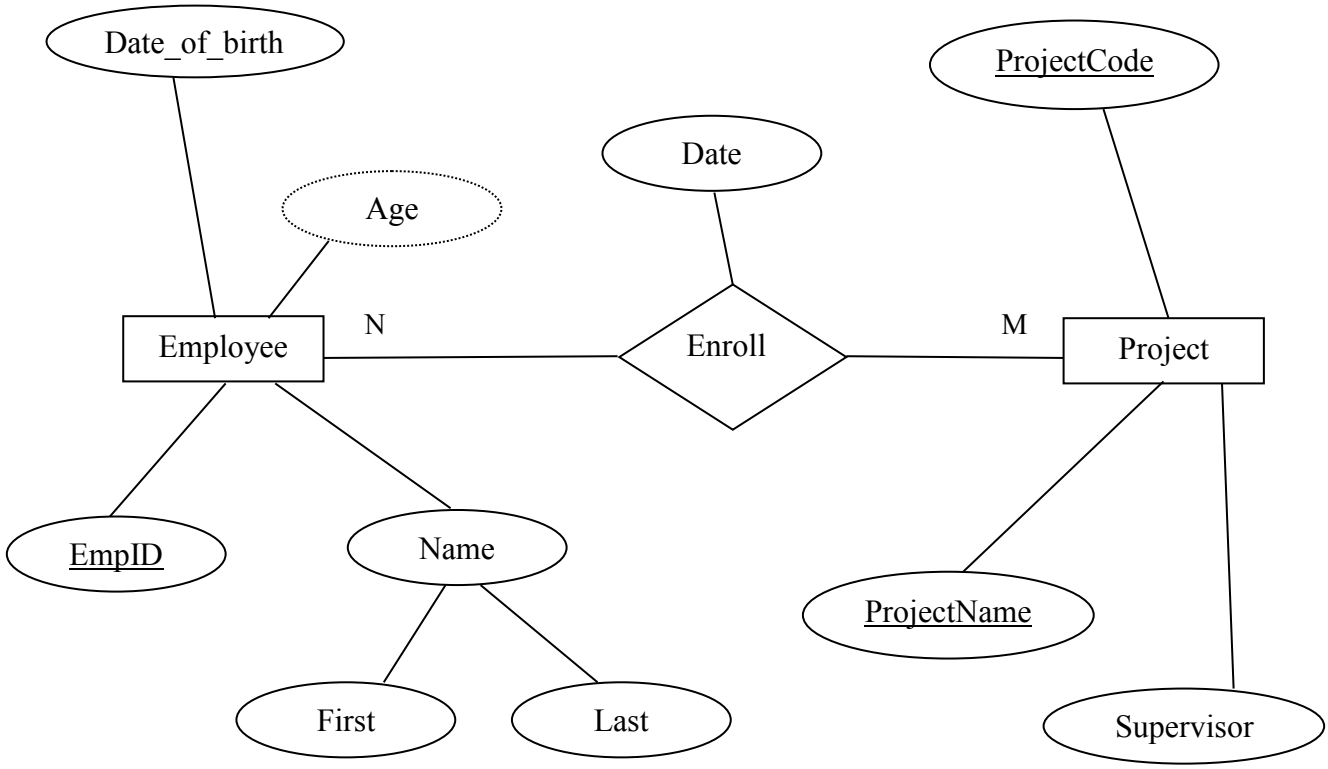
(b) (i) and (ii) only

(c) (i) and (iii) only

(d) (ii) and (iii) only

(e) (i), (ii) and (iii)

Consider the following Entity Relationship Diagram (ERD) to answer the questions from (34) to (35).



34) Consider the following statements about the ERD.

(i) Employee is an entity
(ii) Name is an entity
(iii) Age is an multivalued attribute

Which of the above is/are correct?

(a) (i) only
(b) (ii) only
(c) (i) and (ii) only
(d) (ii) and (iii) only
(e) (i), (ii) and (iii)

35) What relations would be in the relational schema when the above ERD is mapped to a relational schema?

(a) Employee (EmpID, Name, Age, Date_of_birth)
(b) Enroll (EmpID, ProjectCode, Date)
(c) Project (ProjectCode, ProjectName, Supervisor)
(d) Employee (EmpID, First, Last, Date_of_birth)
(e) Project (Project_code, ProjectName, Supervisor, EmpID)

36) In a banking system the following scenarios may take place.

(i) The account balance could go below the minimum allowed.

(ii) Customers are able to find out the bank balance of other customers.

(iii) An incorrect bank balance might be reflected due to simultaneous withdrawals and deposits.

(iv) If system fails in the middle of a money transfer from one account to another account, it is not possible to restore to the consistent state that existed prior to the failure.

Select the correct statement(s) which are probable reasons for the above scenarios.

(a) (i) occurs due to concurrency control failure.
(b) (i) occurs due to integrity enforcement failure.
(c) (ii) occurs due to security enforcement failure.
(d) (iii) occurs due to security enforcement failure.
(e) (iv) occurs due to concurrency control failure.

37) Consider the following two relations. Primary keys are in bold font and Foreign key is underlined.

Department (**Dept_Code**, Dep_Name, Dept_Head)
Employee (**Emp_ID**, Emp_Name, Designation, DoB, <u>Dept</u>)

Select the SQL statement(s) which create a view to see the Department Code and the number of employees in each department.

(a) CREATE VIEW Dept_Employees (Dept_Code, No_of_Employees) AS SELECT Dept, Count(*) FROM Employee GROUP BY Dept

(b) CREATE VIEW Dept_Employees (Dept_Code, No_of_Employees) AS SELECT Dept, Count(Dept_Code) FROM Employee GROUP BY Dept

(c) CREATE VIEW Dept_Employees (Dept_Code, No_of_Employees) AS SELECT Dept, Count(*) FROM Employee GROUP BY Emp_ID

(d) CREATE VIEW Dept_Employees (Dept_Code, No_of_Employees)

(e) CREATE VIEW Dept_Employees (Dept_Code, No_of_Employees) AS SELECT Dept, Count(DISTINCT Emp_ID) FROM Employee GROUP BY Dept

38) Which of the following is/are correct regarding data mining?

(a) Data mining helps in extracting meaningful new patterns from a large volume of data.
(b) Data mining cannot be applied to operational databases.
(c) Data mining only allows the users to view information along a single dimension.
(d) Data mining allows analyzing data by categorization and summarization of data.
(e) Data mining is an iterative process that typically involves the Problem definition, Data exploration, Data preparation, Modeling, Evaluation and Deployment phases.

39) Consider the following SQL statement.

GRANT SELECT,

UPDATE (Designation) ON Employee TO Ruwini, Hiruni WITH GRANT OPTION;

Which of the following statements is/are true about the above SQL statement.

(a) Give permission to Ruwini, only to retrieve data from Employee table and give permission to Hiruni, only to update values of the Designation column in the Employee table.

(b) Give permission to Ruwini & Hiruni to retrieve data from Employee table.

(c) Give permission to Hiruni to grant select and update permission of Employee table to Ruwini.

(d) Give permission to Ruwini & Hiruni to update data in the Designation column of the Employee table.

(e) Give permission to Ruwini and Hiruni to update all data except the data in the Designation column of the Employee table.

40) Which of the following activity/activities could happen during the process of normalization?

(a) Creation of new tables

(b) Splitting of tables into other tables

(c) Merging of several table into new tables

(d) Removing some relationships among existing relations of the scheme

(e) Removing existing constraints

41) Which of the following can be considered as a part of a data dictionary of a DBMS?

(a) Metadata
(b) The complete set of data records
(c) Data flow diagram of the system
(d) Catalog of tables
(e) An Entity-Relationship diagram of the schema

42) Which of the following SQL command(s) can be used to remove an object from a database?

(a) DELETE
(b) EDIT
(c) DROP
(d) TRUNCATE
(e) ROLLBACK

43) With respect to the DROP VIEW command, which of the following statement(s) is/are correct?

(a) Removes only the definition of the view
(b) Data referred by the view is not affected
(c) Removes the base tables and all the data referred by the view
(d) Removes the definition of the view and the data referred by the view
(e) Only the owner of the view can execute the drop view command

44) Suppose that the relation R1(A,B) has tuples {(a,b), (a,c), (c,d)}, and the relation R2(B,C) has tuples {(b,e), (c,e), (d,f), (g,h)}.

Consider the following SQL query.

SELECT * FROM R1 RIGHT OUTER JOIN R2 ON R1.B = R2.B;

What is the number of tuples in the result of the above SQL query?

(a) 2
(b) 3
(c) 5
(d) 6
(e) 4

45) Consider the relation R1 (A,B) which has got duplicates as given below.

A	B
a	10,000
a	10,000
a	25,000
b	20,000
b	25,000

Based on the tuples given in R1 which of the following queries has a result that does not produce duplicates?

(i) SELECT A FROM R1 WHERE A = a;
(ii) SELECT MAX(B) FROM R1 GROUP BY A;
(iii) SELECT A,B FROM R1 GROUP BY A,B;

(a) (i) only
(b) (ii) only
(c) (iii) only
(d) (i) and (ii) only
(e) (ii) and (iii) only

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