



UNIVERSITY OF COLOMBO, SRI LANKA

UNIVERSITY OF COLOMBO SCHOOL OF COMPUTING
DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY (EXTERNAL)

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IT2302 - Database Management Systems

13th August 2006

(TWO HOURS)

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 **14** pages.
- All questions are of the MCQ (Multiple Choice Questions) type.
- All questions should be answered.
- 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 -1 (*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.**

Assume that the SQL questions are based on SQL-2 standards, unless stated otherwise.

1) A database system allows

- (a) management and control of data towards an efficient working of an organisation.
- (b) more critical functions in organisations to be computerised and the need to keep a large volume of data available in an up to the minute current state increased.
- (c) any user to access all its data.
- (d) consolidation of information resources in many organisations.
- (e) integration of data across multiple applications into a single application.

2) Controlling redundancy in a database management system helps to

- (a) avoid duplication of effort.
- (b) avoid unnecessary wastage of storage space.
- (c) avoid unauthorised access to data.
- (d) avoid inconsistency among data.
- (e) get backups and the recovery process.

3) Consider the following statements.

- A. Conceptual schema which is the result of conceptual design is a logical description of all data elements and their relationships.
- B. Internal level of the database architecture consists of the physical view of the database.
- C. External level of the database architecture provides the user view of the database.

With respect to the ANSI/SPARC three level database architecture, which of the above is/are correct?

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|-------------------|-------------------|-------------|
| (a) Only A. | (b) Only B. | (c) Only C. |
| (d) Only A and B. | (e) Only B and C. | |

4) Select from among the following the correct statements on database management systems languages.

- (a) In some DBMSs data definition languages are used to specify the conceptual schema only.
- (b) Storage definition languages are used to specify the internal schema of a database.
- (c) In DBMSs, data manipulation languages are used for retrieval, insertion, deletion and modification activities of data.
- (d) Low level or procedural data manipulation languages are called set-oriented data manipulation languages since they can be used to retrieve many records from a database at once.
- (e) A query in a high level DML often specifies how to retrieve data rather than which data to be retrieved and such high level languages are called host languages.

5) Select from among the following the correct statements.

- (a) A database recovery process means two or more transactions to request access to the same database record at about the same time.
- (b) Concurrent processing means a restoring process of a database to its correct state which has been corrupted due to malfunctions.
- (c) Data integrity means the accuracy and consistency of data stored in a database system.
- (d) Data security refers to protecting a database system from unauthorised and malicious use.
- (e) A condition or restriction that is applied to a particular set of data is commonly termed as integrity control.

6) Which of the following functions is/are performed by a database administrator?

- (a) Planning, designing and implementing of database systems
- (b) Allocation of storage locations and data structures
- (c) Establishing standards and procedures for database systems
- (d) Viewing a database system from the perspective of the functions it should perform
- (e) Communicating with database users

7) Consider the following statements.

- A. An entity integrity constraint states that no primary key value can be null.
- B. A referential integrity constraint is specified between two relations.
- C. A foreign key cannot be used to refer to its own relation.

Identify which of the above statements is/are correct.

- | | |
|--|---|
| <ul style="list-style-type: none">(a) Only A.(c) Only B and C.(e) All. | <ul style="list-style-type: none">(b) Only B.(d) Only A and B. |
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8) In some numerical data types, one has to indicate the precision. Precision indicates

- | |
|---|
| <ul style="list-style-type: none">(a) the number of decimal points required.(b) a rule that restricts a value in a relation.(c) a value which is automatically inserted if there is no value placed in a relation.(d) the total number of digits in a number.(e) a specialized data type defined within a schema and used in a column definition. |
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9) Consider the following SQL statement.

CREATE DOMAIN CHR_TYPE AS CHAR(9);

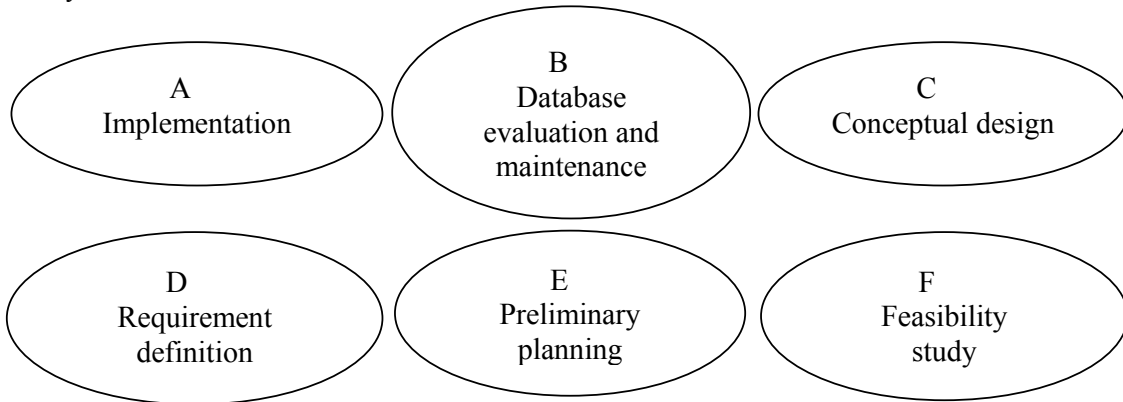
Which of the following correctly describes the above SQL statement?

- | |
|---|
| <ul style="list-style-type: none">(a) It creates a relation called CHR_TYPE for only character types.(b) It creates a domain name CHR_TYPE.(c) It creates a domain called CHAR(9).(d) One can use CHR_TYPE in place of CHAR(9) in relevant places.(e) It creates a character type called domain which can be used in place of CHR_TYPE. |
|---|

10) Select from among the following the correct statements on main phases of the database design process.

- | |
|---|
| <ul style="list-style-type: none">(a) During requirements collection and analysis phase, one can gather the data requirements of database users.(b) When the functional requirements are specified, database designers are keen on identifying user defined operations or transactions related to a database.(c) By referring to a high level data model, it is possible to understand the data requirements of the users, entity types, relationships and constraints.(d) Transformation of the high level data model into the implementation data model is called logical design or data model mapping.(e) During the logical design phase of internal storage structures, access paths and file organization for the database files are specified. |
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- 11) The following figures numbered with letters A-F indicate various phases of the database system life cycle.



Which of the following indicate the correct sequence of the database system life cycle?

- (a) $B \rightarrow A \rightarrow C \rightarrow E \rightarrow D \rightarrow F$
 (b) $E \rightarrow F \rightarrow D \rightarrow C \rightarrow A \rightarrow B$
 (c) $A \rightarrow F \rightarrow E \rightarrow D \rightarrow C \rightarrow B$
 (d) $F \rightarrow B \rightarrow C \rightarrow D \rightarrow E \rightarrow A$
 (e) $A \rightarrow E \rightarrow C \rightarrow D \rightarrow B \rightarrow F$

- 12) Select the correct statement(s) from among the following.

- (a) The number of participating entity types determines the degree of relationship type among different entity types.
 (b) Role names are not technically necessary in relationship types when all the participating entity types are distinct.
 (c) When different entity types participate only once in a single relationship type it is called a recursive relationship.
 (d) Cardinality ratios for binary relationship are displayed on Entity Relationship Diagrams by using a diamond shape notation.
 (e) Partial participation which is also called existence dependency is displayed as a double line connecting the participating entity type to the relationship.

- 13) Consider the following two columns. The **Column A** consists of terms related to the ER model and **Column B** consists of terms used in the relational model.

Column A

1. Entity type
2. Key attributes
3. Composite attribute
4. Multivalued attribute
5. Value set

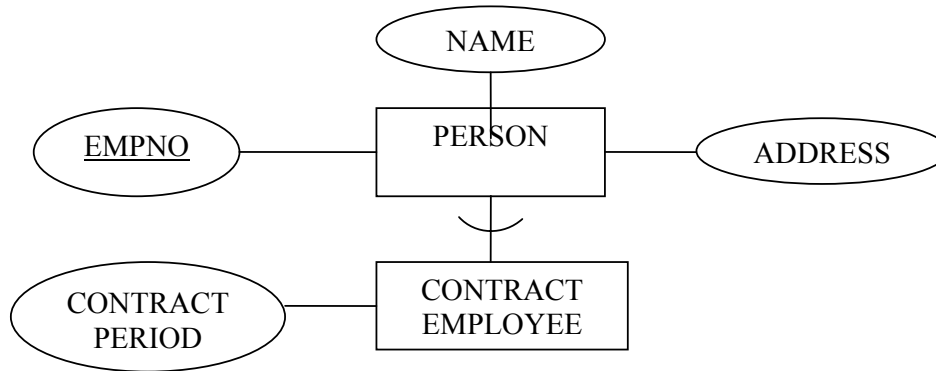
Column B

- A. Primary or(Secondary) key
- B. Domain
- C. Relation and foreign key
- D. Set of simple component attributes
- E. Relation

The terms in **Column A** have been mapped to **Column B** so that it corresponds to the mapping process of the ER Model into a Relational model. Which of the following represent the mapping process?

- (a) $1 \rightarrow C, 2 \rightarrow A, 3 \rightarrow D, 4 \rightarrow E, 5 \rightarrow B$ (b) $1 \rightarrow B, 2 \rightarrow A, 3 \rightarrow D, 4 \rightarrow E, 5 \rightarrow C$
 (c) $1 \rightarrow C, 2 \rightarrow A, 3 \rightarrow E, 4 \rightarrow D, 5 \rightarrow B$ (d) $1 \rightarrow E, 2 \rightarrow A, 3 \rightarrow D, 4 \rightarrow C, 5 \rightarrow B$
 (e) $1 \rightarrow B, 2 \rightarrow A, 3 \rightarrow E, 4 \rightarrow C, 5 \rightarrow D$

- 14) Consider the following diagram illustrating some details of an employee.



After transforming the above ER diagram into its relational model the following two relations were identified.

PERSON(EMPNO#, NAME, ADDRESS)

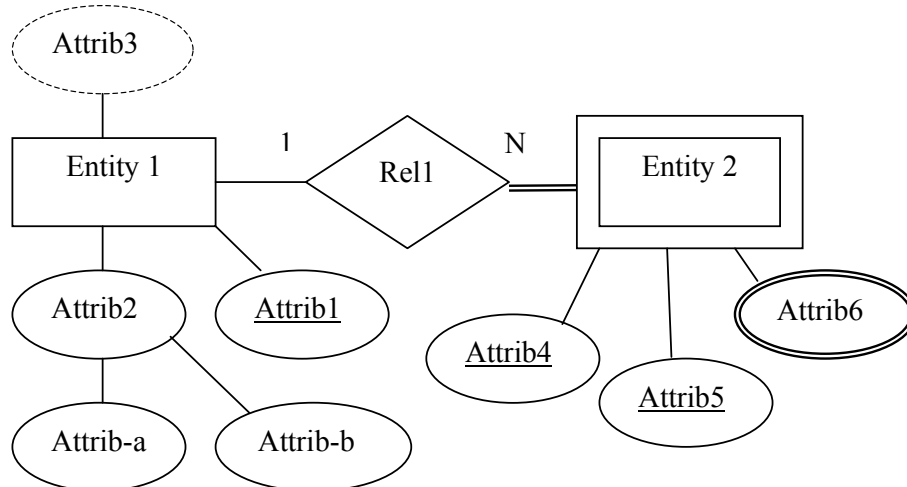
CONTRACTEMPLOYEE(EMPNO#, NAME, ADDRESS, CONTRACTPERIOD)

FOREIGN KEY: EMPNO# REFERENCES PERSON

Select from among the following, the changes which are required/possible for the above two relations.

- (a) CONTRACTPERIOD attribute should be included in the PERSON relation.
- (b) EMPNO# attribute cannot be introduced in the CONTRACTEMPLOYEE relation.
- (c) NAME and ADDRESS attributes should be eliminated from the CONTRACTEMPLOYEE relation.
- (d) EMPNO# attribute cannot be included in the PERSON relation.
- (e) It is not necessary to have two relations called PERSON and CONTRACTEMPLOYEE to represent the diagram but one relation is enough.

- 15) The following diagram describes a part of an ER diagram.



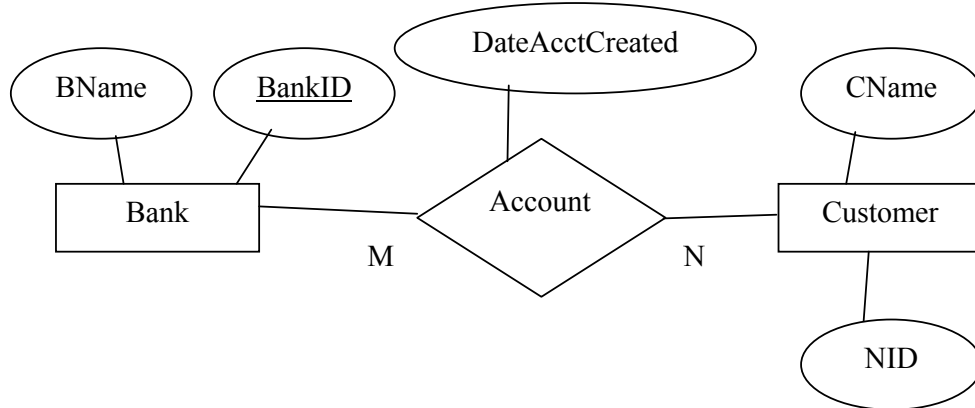
Select from among the following, the correct statements on the above diagram.

- (a) Entity2 is a weak entity.
- (b) Cardinality ratio for Entity1:Entity2 in Rel1 is 1:N.
- (c) Attrib6 represents an attribute which is having composite nature.
- (d) Attrib3 is a kind of a derived attributes.
- (e) Entity2 is participating totally in the Rel1 relationship.

16) Select from among the following, the correct statements about entities and attributes.

- (a) An entity may be an object with a physical existence like a car, a house or an Employee.
- (b) One cannot consider something which has conceptual existence like a course in a degree program as an entity.
- (c) Age can be considered as a single value attribute of a person.
- (d) The attribute Date_of_birth can be considered as a derived attribute and similarly the Age can be considered as a stored attribute.
- (e) An entity type describes the schema or intension for a set of entities which share the same structure.

17) 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.

- (a) Customer(NID, CName)
- (b) Account(DateAcctCreated, BName, CName)
- (c) Bank(BankID, NID, BName,)
- (d) Bank(BankID, BName)
- (e) Account(BankID, NID, DateAccCreated)

18) Which of the following statements is/are correct with respect to normalization?

- (a) Normalization is a formal technique that can be used at any stage of the database design.
- (b) Normalization can be used as a top-down standalone database design technique.
- (c) Normalization can be used as a validation technique to check the structure of relations which may have been created using ER modeling.
- (d) The process of normalization through decomposition must achieve the lossless join property at any cost whereas the dependency reservation property is sometimes sacrificed.
- (e) The process of normalization through decomposition must achieve the dependency reservation property at any cost whereas the lossless join property is sometimes sacrificed.

19) Which of the following operations is part of the five basic set operations in relational algebra?

- | | | |
|-----------------------|--------------------|--------------|
| (a) Join | (b) Union | (c) Division |
| (d) Cartesian Product | (e) Set Difference | |

Given below are some tables from a property agency. Answer questions 20 to 21 based on the given information.

Branch

| BranchNo | Street | City |
|----------|-------------|----------|
| B1 | Queen | Kandy |
| B2 | Main | Galle |
| B3 | First Cross | Colombo |
| B4 | Market | Nugegoda |
| B5 | Dam | Matara |

PropertyForRent

| PropertyNo | Address | City | Type | Rooms | Rent | OwnerNo | BranchNo |
|------------|-----------------|---------|-------|-------|--------|---------|----------|
| P15 | 05, Queen St. | Kandy | House | 6 | 25,000 | C01 | B1 |
| P90 | 26, Main St. | Galle | Flat | 4 | 10,000 | C05 | B2 |
| P4 | 12, Fonseka Rd. | Colombo | Flat | 3 | 15,000 | C07 | B3 |
| P35 | 17, Reid Av. | Colombo | House | 3 | 20,000 | C10 | B3 |
| P23 | 45, Vajira Rd. | Colombo | Flat | 5 | 35,000 | C07 | B3 |
| P16 | 35, Third Lane | Colombo | Flat | 4 | 25,000 | C16 | B3 |

Viewing

| ClientNo | PropertyNo | ViewDate | Comment |
|----------|------------|----------|-----------|
| C5 | P15 | 25/05/06 | Too big |
| C7 | P4 | 20/06/06 | Too small |
| C5 | P4 | 21/06/06 | |
| C6 | P15 | 29/05/06 | |
| C5 | P35 | 12/06/06 | No garden |

- 20) Which of the following relational algebra expressions would list all cities where there is both a branch office and at least one property for rent?

- (a) $\pi_{City}(\text{Branch}) \cup \pi_{City}(\text{PropertyForRent})$
 (b) $\pi_{City}(\text{Branch}) - \pi_{City}(\text{PropertyForRent})$
 (c) $\pi_{City}(\text{Branch}) \cap \pi_{City}(\text{PropertyForRent})$
 (d) $\pi_{City}(\text{Branch}) \div \pi_{City}(\text{PropertyForRent})$
 (e) $\pi_{City}(\text{Branch}) - (\pi_{City}(\text{Branch}) - \pi_{City}(\text{PropertyForRent}))$

- 21) Consider the following relational algebra expression.

$$\pi_{ClientNo, PropertyNo}(\text{Viewing}) \div (\pi_{PropertyNo}(\sigma_{Rooms = 3}(\text{PropertyForRent})))$$

The above relational algebra expression would list

- (a) ClientNos of those who have viewed any house with three rooms.
 (b) ClientNos of those who have viewed any house other than a house with three rooms.
 (c) ClientNos of those who have viewed all the houses with three rooms.
 (d) ClientNos of those who have viewed all the houses except the houses with three rooms
 (e) ClientNos of those who have viewed only houses with three rooms.

Given below is part of the database of a medical center. Answer questions 22 to 33 based on the tables Doctor and Patient given with respect to the medical center database.

Doctor

| Doc Id | Doc_Name | Salpermon | Area | Supervisor | DateHired | Chgper Appt | Annual_Bonus |
|--------|----------|-----------|--------------|------------|-----------|-------------|--------------|
| 432 | Perera | 60000 | Paediatrics | 100 | 10/12/92 | 750 | 40000 |
| 509 | Silva | 40000 | Paediatrics | 432 | 08/01/02 | 400 | 15000 |
| 389 | Dias | 50000 | Paediatrics | 432 | 23/01/95 | 450 | 20000 |
| 504 | Fernando | 57000 | Neurology | 289 | 25/08/98 | 300 | 25000 |
| 235 | Ellawala | 55000 | Orthopaedics | 100 | 05/05/95 | 850 | 35000 |
| 889 | Kumara | 30000 | Orthopaedics | 235 | 16/11/99 | 400 | 20000 |
| 289 | Gamage | 80000 | Neurology | 100 | 23/06/88 | 600 | 32000 |
| 100 | Thisera | 95000 | Director | | 25/06/80 | | 50000 |

Patient

| Pt Id | Pt Name | Doc Id | PtDOB | City | Street |
|-------|----------|--------|----------|------------|-------------|
| 168 | Sheshini | 432 | 05/03/02 | Colombo | First |
| 302 | Daya | 289 | 25/04/45 | Kohuwala | Dutu Gemunu |
| 103 | Amila | 235 | 15/06/81 | Nugegoda | Market |
| 715 | Asela | 889 | 06/03/75 | Maharagama | Second |
| 150 | Sarath | 504 | 07/07/63 | Colombo | Queen |
| 940 | Lasith | 509 | 10/11/03 | Kottawa | First Cross |
| 505 | Himali | 889 | 13/05/74 | COLOMBO | Dam |
| 250 | Ajith | 504 | 16/02/55 | Maharagama | Main |

- 22) Which of the following SQL statements display(s) doctor's name and annual income for each doctor?

- (a) SELECT Doc_Name, Salpermon * 12 + Annual_Bonus FROM Doctor
 (b) SELECT Doc_Name, Salpermon * 12 + Annual_Bonus as Annual Income FROM Doctor;
 (c) SELECT Doc_Name, "Annual Income" FROM Doctor where "Annual Income" = Salpermon * 12 + Annual_Bonus;
 (d) SELECT Doc_Name , Salpermon * 12 + Annual_Bonus 'Annual Income' FROM Doctor;
 (e) SELECT Doc_Name ,TO_CHAR(Salpermon * 12 + Annual_Bonus, '999999') Annual Income FROM Doctor;

- 23) Consider the following details of a doctor. Note SYSDATE returns the current system date.

Doc_Id - 350 Doc_Name - Vaas Salpermon - 35,000 Area - Orthopaedics Supervisor – 235
 DateHired - SYSDATE , Chgperappt – 300

Which of the following SQL statements will insert the above into Doctor's Table?

- (a) INSERT INTO Doctor VALUES ('350', 'Vaas', 35000, 'Orthopaedics', '235', SYSDATE, 300);
 (b) INSERT INTO Doctor (Doc_Id ,Doc_Name, Salpermon, Area , Supervisor, Chgperappt, DateHired) VALUES ('350', 'Vaas', 35000, 'Orthopaedics', '235', SYSDATE, 300);
 (c) INSERT INTO Doctor (Doc_Name, Area , DateHired, Doc_Id, Salpermon, Chgperappt, Supervisor) VALUES ('Vaas', 'Orthopaedics', SYSDATE, '350', 35,000, 300, '235');
 (d) INSERT INTO Doctor VALUES ('350', 'Vaas', 35,000, 'Orthopaedics', '235', SYSDATE, 300);
 (e) INSERT (Doc_Id ,Doc_Name, Salpermon, Area , Supervisor, DateHired , Chgperappt) VALUES ('350', 'Vaas', 35,000, 'Orthopaedics', '235', SYSDATE , 300) INTO Doctor;

24) Consider the following two queries.

(i) SELECT Doc_Name FROM Doctor
WHERE Area = (SELECT Area
FROM Doctor
WHERE Doc_Name = 'Ellawala')

(ii) SELECT Doc_Name
FROM Doctor A, Doctor B
WHERE A. Area = B.Area and
A.Doc_Name = 'Ellawala'

Which of the following is/are correct?

- (a) Both queries will give the same results.
- (b) The results of the two queries will be different.
- (c) Query (ii) will give a syntax error.
- (d) Query (i) uses a sub query and therefore it is more efficient than query (ii).
- (e) Query (ii) uses join and therefore it is more efficient than query (i).

25) Consider the following two queries.

(i) SELECT Pt_Id FROM Patient
WHERE (City, Street) IN
(SELECT City, Street FROM Patient
WHERE Pt_Id = '168');
and Pt_Id <> '168' ;

(ii) SELECT Pt_Id FROM Patient
WHERE (Upper(City), Street) IN
(SELECT Upper(City), Street
FROM Patient WHERE Pt_Id = '168')
and Pt_Id <> '168' ;

Which of the following is/are correct?

- (a) The two queries will list the same set of Pt_Ids.
- (b) The two queries will list different sets of Pt_Ids.
- (c) Both queries should list the Pt_Ids who live in the same town as Pt_Id = '168'.
- (d) Query (ii) will give a syntax error since it uses the function Upper(city) on the 'where' clause.
- (e) Both queries will give syntax errors since they use statements Pt_Id = '168' and Pt_Id <> '168' which are contradicting.

26) A constraint should be specified to ensure that a doctor does not handle too many patients. Which of the following statements is/are correct regarding the above constraint?

- (a) This constraint cannot be specified with create table statement using DDL.
- (b) This constraint is specified on Doctor table.
- (c) This constraint is specified on Patient table.
- (d) This constraint is specified on Patient table as follows:
Doc_Id char(5) Constraint TooManyPt Check Count(Pt_Id) > 100;
- (e) This constraint is specified on Doctor table as follows:
Doc_Id char(5) Constraint TooManyPt
Check (SELECT Doc_Id FROM Patient WHERE Count(Doc_Id) <100);

27) Which of the following SQL statements would display all doctor's names and hired dates in chronological order with the person on staff with the longest service, listed first?

- (a) SELECT Doc_Name, DateHired FROM Doctor ORDER BY DateHired;
- (b) SELECT Doc_Name, DateHired FROM Doctor ORDER BY Doc_name, DateHired;
- (c) SELECT Doc_Name, DateHired FROM Doctor ORDER BY Doc_name, DateHired ASC
- (d) SELECT Doc_Name, DateHired FROM Doctor ORDER BY DateHired DESC;
- (e) SELECT Doc_Name, DateHired FROM Doctor ORDER BY DateHired ASC;

- 28) Consider the following two queries to display the doctor's name and the name of the doctor's supervisor in alphabetic order of the supervisor.

(i) SELECT d.Doc_Name as Doctor,
s.Doc_Name as Supervisor
FROM Doctor d, Doctor s
WHERE d.Supervisor = s.Doc_Id
ORDER BY s.Doc_Name;

(ii) SELECT d.Doc_Name as Doctor,
s.Doc_Name as Supervisor
FROM Doctor d, Doctor s
WHERE s.Supervisor = d.Doc_Id
ORDER BY s.Doc_Name;

Which of the following is/are correct?

- (a) Both queries will display the doctor's name and the name of the doctor's supervisor in alphabetic order of supervisor.
- (b) Output of the two queries will be different.
- (c) Only query (i) will give the required results.
- (d) Only query (ii) will give the required results.
- (e) Neither query (i) nor query (ii) will give the required results.

- 29) The following SQL statement once completed is expected to be used to retrieve the name and monthly salary of each doctor who earns more than the maximum monthly salary in the area of Paediatrics.

```
SELECT Doc_Name, Salpermon FROM Doctor
WHERE .....(SELECT Salpermon FROM Doctor WHERE Area = 'Paediatrics')
```

Which of the following should be used to obtain the expected information?

- (a) Salpermon >
- (b) Salpermon > ALL
- (c) Salpermon IN
- (d) Salpermon > ANY
- (e) Salpermon EXISTS

- 30) Which of the following queries would display the names and areas of doctors specializing in Paediatrics or Neurology?

- (a) SELECT Doc_Name, Area FROM Doctor WHERE Area IN ('Paediatrics', 'Neurology');
- (b) SELECT Doc_Name, Area FROM Doctor WHERE Area IN ("Paediatrics", "Neurology");
- (c) SELECT Doc_Name, Area
FROM Doctor WHERE Area = 'Paediatrics' or Area = 'Neurology';
- (d) SELECT Doc_Name, Area
FROM Doctor WHERE Area = 'Paediatrics' and Area = 'Neurology';
- (e) SELECT Doc_Name, Area FROM Doctor WHERE Area = ('Paediatrics' or 'Neurology');

- 31) Which of the following SQL statements increments the ChgperAppt by Rs: 200/= for doctors who are Orthopaedics?

- (a) UPDATE Doctor SET ChgperAppt = ChgperAppt + 200 WHERE Area = 'Orthopaedics';
- (b) UPDATE SET ChgperAppt = ChgperAppt + 200
FROM Doctor WHERE Area = 'Orthopaedics';
- (c) UPDATE Doctor SET ChgperAppt = ChgperAppt + 200
WHERE Doc_Id IN (SELECT Doc_Id FROM Doctor WHERE Area = 'Orthopaedics');
- (d) UPDATE ChgperAppt + 200 FROM Doctor WHERE Area = 'Orthopaedics';
- (e) UPDATE SET ChgperAppt = ChgperAppt + 200
FROM Doctor WHERE Area = 'Orthopaedics';

- 32) Consider the following two queries which were written to display the names and charges per appointment for doctors who charge more per appointment than any one of the doctors in Orthopaedics.

| | |
|---|---|
| (i) SELECT Doc_Name, ChgperAppt FROM Doctor WHERE ChgperAppt > ANY (SELECT ChgperAppt FROM Doctor WHERE Area = 'Orthopaedics'); | (ii) SELECT Doc_Name, ChgperAppt FROM Doctor WHERE ChgperAppt > (SELECT Min(ChgperAppt) FROM Doctor WHERE Area = 'Orthopaedics'); |
|---|---|

Which of the following is/are correct?

- (a) Both queries will give the required results in the same order as in the Doctor table.
- (b) Both queries will give the required results in a different order.
- (c) Only query (i) will give the required results while query (ii) will not.
- (d) Only query (ii) will give the required results while query (i) will not.
- (e) Neither query (i) nor query (ii) will give the required results.

- 33) Consider the following query.

```
SELECT Doc_Id, Doc_Name, Salpermon – (SELECT Avg(Salpermon) FROM Doctor)
AS Saldiff FROM Doctor WHERE Salpermon > (SELECT Avg(Salpermon) FROM Doctor);
```

Which of the following is/are correct?

- (a) The query has an error and hence will not execute.
- (b) This query will display the difference between the salary of each doctor and the average salary with respect to all doctors.
- (c) This query makes use of nested sub queries.
- (d) The same query can also be written as follows:
SELECT Doc_Id, Doc_Name,
Salpermon – (SELECT Avg(Salpermon) FROM Doctor) AS saldiff
FROM Doctor WHERE Salpermon > Avg(Salpermon);
- (e) The above query should be corrected as follows:
SELECT Doc_Id, Doc_Name, Salpermon – Avg(Salpermon) as saldiff
FROM Doctor HAVING Salpermon > Avg(Salpermon);

- 34) Consider the relation Interview(CandidateNo, InterviewDate, InterviewTime, StaffNo, RoomNo) and the following functional dependencies.

FD1 : CandidateNo, InterviewDate → InterviewTime, StaffNo, RoomNo
FD2 : RoomNo, InterviewDate, InterviewTime → StaffNo, CandidateNo
FD3 : StaffNo, InterviewDate → RoomNo

Which of the following is/are correct?

- | | |
|---|--|
| (a) The relation Interview is in 3NF. (c) The FD3 violates 3NF. (e) The FD2 violates 2NF. | (b) The relation Interview is in BCNF. (d) The FD3 violates BCNF. |
|---|--|

- 35) Consider the relations given below. The relations given in (i) and (ii) respectively have been achieved by normalising the relation Person(NID, {Car_Lic#}, {Phone#})

- (i) Person(NID, Car_Lic#, Phone#)
(ii) Person1(NID, Car_Lic#) ; Person2(NID, Phone#)

Which of the following statements is/are correct with respect to solutions (i) and (ii)?

- | |
|--|
| (a) Solution (i) is considered as the better solution since solution (ii) introduces new relations. (b) Solution (ii) is considered as the better solution since solution (i) results in an all-key relation. (c) Solution (i) suffers from redundancy. (d) Solution (ii) suffers from redundancy. (e) Only solution (i) holds dependency preservation property. |
|--|

- 36) Consider the following set of functional dependencies (FDs) on the following relational schema.

Emp_No \rightarrow {Ename, Bdate, Address, Dept_No}
Dept_No \rightarrow {Dname, Mgr_No}

The additional FD(s) which can be inferred from the above set of FD s is/are

- | | |
|---|--|
| (a) Emp_No \rightarrow {Dname, Mgr_No} . (c) Emp_No \rightarrow Emp_No . (e) Emp_Name, Dept_No \rightarrow Mgr_No . | (b) Emp_Name \rightarrow Dept_No . (d) Emp_Name \rightarrow Dept_Name . |
|---|--|

- 37) Select from among the following the correct statements on embedded SQL.

- | |
|---|
| (a) It provides a set of statements used to embed SQL statements in high level programming languages. (b) It has flag statements to signal the beginning or end of a set of SQL statements in application programs. (c) Embedded SQL statements are sometimes called host languages. (d) Examples of Embedded SQL are Cobol and C. (e) Embedded SQL has cursor facility where the result of an SQL query is stored for subsequent processing. |
|---|

- 38) What key words are available in SQL to enforce referential integrity?

- | | |
|---|-------------------------------|
| (a) Check (c) Set Default (e) No Action | (b) Primary Key (d) Unique |
|---|-------------------------------|

- 39) Which of the following SQL keywords is/are used with DDL statements?

- | | | |
|-------------------------|------------------------|------------|
| (a) Grant (d) Create | (b) Check (e) Alter | (c) Update |
|-------------------------|------------------------|------------|

- 40) A View in a Database Management System is a
- (a) means of providing a user with a personalized model of the database.
 - (b) way of automatically attaining high degree of access control to a database.
 - (c) way of keeping accuracy and consistency of data values in the database.
 - (d) way of viewing a system from the perspective of the functions it should perform.
 - (e) useful way of limiting a user's access to various portions of the database.
- 41) Discretionary security mechanism is one of the security mechanisms which is used by the database security and authorization subsystem. Select from among the following, correct statements on Discretionary security in a Database Management System.
- (a) A typical method of enforcing a Discretionary security mechanism is granting and revoking privileges.
 - (b) A Discretionary security mechanism is based on the concept of full functional dependency.
 - (c) A Discretionary security mechanism is a collection of decision support technologies, aimed at enabling the knowledge worker to make better and faster decisions.
 - (d) In Discretionary security mechanisms, there are two levels for assigning privileges to use the database system: (1) the account level (2) the relational level.
 - (e) When all participating databases signal the coordinator that one part of the multidatabase transaction involving each has concluded, the coordinator sends a message "prepare for commit" and this process is called Discretionary security mechanism.
- 42) A distributed database is a
- (a) database that is distributed among a network of geographically separated locations.
 - (b) collection of locations, each of which is operated as a local database system while accessing data at several locations.
 - (c) user program which interacts with the DDBMSs.
 - (d) process which cooperates in completing transactions.
 - (e) software that manages the collection of storage locations and data structures.
- 43) A trigger in DBMSs is a
- (a) technique for specifying certain types of active rules for active databases.
 - (b) utility which can be used to reorganise a database file into a different file organisation to improve performance.
 - (c) rule for structuring relations which eliminates anomalies.
 - (d) rule that restricts the null values in a database.
 - (e) set of attributes in one relation that constitutes a key in some other relation.
- 44) Stored procedures
- (a) are SQL programs which are compiled the first time, executed and stored for later use.
 - (b) execute very fast since they are already compiled.
 - (c) can receive and return parameters and results.
 - (d) are defined to be used within a procedure to store temporary working values.
 - (e) are part of the DBMS that defines the structure of user data and how they are to be used.

45) Consider the following stored procedure.

```
create procedure averagesal @avg_hrly_rate money output, @skilltype char(8) as  
select @avg_hrly_rate = avg(hrly_rate)  
from worker  
where skill_type = @skill_type
```

Select from among the following, the correct statement(s) about the above stored procedure.

- (a) Name of the stored procedure is averagesal.
- (b) @avg_hrly_rate is a local variable for output.
- (c) Skill_type is a local variable for output.
- (d) There is a relation name called worker which has a field name called skill_type.
- (e) char(8) is a global variable for input.
