***SCRIS – 03.02.2016***

1. Are foreign keys allowed to have null values?

c) Yes, because there are situations in which such kind of information is not available

1. What is a logical data independence?

d) Changes made in a conceptual schema of a database will not affect the external schemas

1. Which of the following is not a criteria to use databases for your software system?

c) Low-level data access

1. Which of the following statements about dense sparse is false?
2. A dense index must be clustered
3. Which of the following definitions is not an alternative of data entries in index files?

8. In sql, if is needed to display records from lowest to highest value, which one of the following commands will be used?

a) Sort ascending

9. Which of the following is not an alternative osyf mapping inheritance relationship between 2 classes A and B in tables from relational model?

D) Create tables A,B and a cross-table between them

1. Which of the following decompositions of the schema {A,B,C,D,E,F} are dependency preserving descompositions under the given functional dependencies?

C) {A,B,C,D,F} and {B,C,E} given ABC->DEF, BC->E and C->B

1. Given two relations, and the following queries:

Q1: SELECT DISTINCT R.B FROM R LEFT OUTER JOIN S ON R.B=S.A

Q2: SELECT DISTINCT S.A FROM R RIGHT OUTER JOIN S ON R.C=S.D

a) Q1 and Q2 have the same number of tuples

12.Consider the following relation and functional dependencies: S(A,B,C,D) {A->BCD,C->AB}. Which is the list of candidate keys?

b) A, C

13. Which of the following best characterizes a balanced tree?

c) For each node the difference between its sub-trees heights is 1,0 or -1

14.Who is responsible for unpinning a page in buffer pool?

B) The requestor of the page.

15. The following SQL queries refer to relations R(a;b) and S(b;c):

Q1: SELECT \* FROM R INNER JOIN S ON R.b=S.b;

Q2: SELECT \* FROM R LEFT JOIN S on R.b=S.b;

1. The answer to Q1 is always contained in the answer to Q2

***SCRIS – 31.01.2016***

***SUBIECT 4***

1. Se dau urmatoarele instante a doua relatii R si S: Care este rezulatatul executiei urmatoare interogari? q((D->A,E->C), S) – Pi A,C (R)
2. A: 3 C: 6
3. Ce este independent fizica a datelor?
4. Modificarile structurii conceptuale a bazei de date nu vor afecta structura externe

1. Care dintre urmatoarele criterii nu reprezinta un argument valid de utilizare a unei baze de date?
2. Gestiunea unei colectii de date de dimensiuni reduse
3. Ce element nou este introdus la nivelul definirii unei clase in bazele de date orientate obict in comparative cu limbajele de programare orientate obiect obisnuite?

c) Relatii de asociere

1. In cazul relatiei R(A;B;C;D;E) avand dependentele functionale AB->C,C->B,D->E, numarul super-cheilor este egal cu?

c) 6

1. O tabela este o colectie de:

c) Inregistrari

1. Pentru a afisa mai multe inregistrari intr-o secventa de la cea mai mare la cea mai mica valoare a unui camp se utilizeaza:

c) ORDER BY DESC

1. Ordinea corecta a termenilor de la cel mai simplu la cel mai complex este:
2. Camp, inregistrare, tabela, baza de date
3. Fie urmatoarea relatie Persoane(Cod, Nume, DataNasterii, Oras, Profesie). Care din urmatoarele interogari determina progamatorii din Cluj-Napoca?
4. Sigma oras=’Cluj-Napoca’ ( sigma profesie=’Programator’ (Persoane))
5. Cu care dintre urmatoarele dependente functionale este compatibila relatia:

b)AB->C

1. Care din urmatoarele politici nu este utilizata in inlocuirea de pagini de memorie din memoria interna alocata unui sistem de gestiune a bazelor de date?

c)Never Used Page(NUP)

1. Care din urmatoarele afirmatii este falsa?
2. O cheie straina este implicit si super-cheie
3. Care dintre urmatoarele interogari este un exemplu corect pentru obtinerea intregistarilor din tabela T care au valoarea NULL pe campul C?
4. SELECT \* FROM T WHERE C IS NULL
5. Un index clustered este un index in care:
6. Ordinea de stocare a inregistrarilor din tabela indexata este aceasi cu ordinea memorarii intrarilor din index
7. Rezultatul interogarilor Q1 si Q2 va fi dat de colectia de inregistrari returnata de executia comenzii SELECT \* FROM R. Vom presupune ca structura relatiei R este R(a;b).

Q1: UPDATE R SET b=10 WHERE a=20;

SELECT \* FROM R;

Q2: DELETE FROM R WHERE a=20;

INSERT INTO R VALUES(20,10);

SELECT \* FROM R;

C) Raspunsul lui Q2 este intotdeauna continut in raspunsul lui Q1

1. Pentru urmatoarele interogari se poate considere o structura arbitrara a lui R dar care include un camp b

Q1: SELECT COUNT(DISTINCT b) FROM R;

Q2: SELECT COUNT(b) FROM R;

d. Q1 si Q2 produc raspunsuri diferite

1. Pentru urmatoarele interogari se poate considere o structura arbitrara a lui R dar care include campurile a si b

Q1: SELECT DISTINCT a FROM R WHERE b>0;

Q2: SELECT a FROM R WHERE b>0 GROUP BY a;

a.Q1 si Q2 produc acelasi raspuns

1. Urmatoarele interogari se executa pe relatiile R(a;b) si S(b;c):

Q1: SELECT \* FROM R INNER JOIN S ON R.b=S.b;

Q2: SELECT \* FROM R LEFT JOIN S ON R.b=S.b;

b. Raspunsul lui Q1 este intotdeauna continut in raspunsul lui Q2

1. In urmatoarele interogari vom presupune ca relatiile R(a;b) si S(a;b) nu au valori NULL dar pot contine inregistrari duplicate.

Q1: SELECT R.a FROM R,S WHERE R.b=S.b;

Q2: SELECT R.a FROM R WHERE R.b IN( SELECT S.b FROM S; );

1. Q1 si Q2 produc acelasi raspuns
2. Pentru urmatoarele interogari se considera ca cheia relatiei R(a;b;c) este c.

Q1: SELECT a, MAX(b) FROM R GROUP BY a;

Q2: SELECT a,b FROM R r1 WHERE b>= ALL(SELECT b FROM R r2 WHERE r1.a=r2.a);

Q1 CUPRINS IN Q2

***SCRIS – 31.01.2016***

***SUBIECT 5***

1. Este posibi ca valoarea unei chei straine sa fie NULL: C) Da, deoarece exista situatii cand o astfel de informatie nu este disponibile
2. Ce este independenta logica a datelor? b) Modificarile structurii conceptuale a bazei de date nu vor afecta structura externa
3. Care din urmatoarele criterii nu reprezinta un argument valid de utilizare a unei base de date: b) Reprezentarea grafia ca informatiilor
4. Un index clustered este un index in care a) Ordinea de stocare a inregistrarilor din tabela indexata este aceeasi cu ordinea memoriarii intrarilor din index

5. ?? Care dintre urmatoarele exemple nu reprezinta o alternativa de memorare a unei intrari intr-un fisier index?

a)<cheie de cautare, inregistrare>

6. Ordinea corecta a termenilor de la cel mai complex la cel mai simplu d) Baza de date, tabela inregistrare, camp

7. Scopul unei tabele este de a :

c) Modela o entitate din lumea reala/conceptual si de a stoca date caracteristice acestei entitati

8. Pentru a afisa mai multe inregistrari intr-o secventa de la cea mai mare la cea mai mica valoare a unui camp particular se utilizeaza c) Order By Desc

9. Care dintre urmatoarele variante NU este o alternative de translatare a unei relatii de .. intre 2 clase A(super-clasa) si B(sub-clasa) in tabelele unui model relational?

C) Creeaza tabelele A si B, fiecare cu propriile atribute din modelul obiecutual

10. Care din urmatoarele descompuneri ale relatiei R{A, B, C, D, E, F} pastreaza dependentele functionale: C) {A, B, C, D, F} si {B, C, E} avand ABC -> DEF, BC -> E si C -> B

11. Fie doua relatii si urmatoarele inregistrari:

Q1: SELECT DISTINCT R.B FROM R LEFT OUTER JOIN S ON R.B=S.A;

Q2: SELECT DISTINCT S.A FROM R RIGHT OUTER JOIN S ON R.C=S.D;

1. Q1 si Q2 produc acelasi numar de inregistrari

12. Fie urmatoarea relatie impreuna cu multimea de dependente functionale satisfacute de aceasta S(A, B, C, D) {A -> BCD, C => AB} Care din urmaotarele reprezinta lista corecta de chei candidate ale lui S? b) A, C

13. Care din urmatoarele afirmatii caracterizeaza cel mai bine un arbore echilibrat c) Pentru fiecare nod diferenta dintre inaltimile subarborilor sai este 1 0 sau -1

14. Care este principal responsabilitate a unui Buffer Manager?

b) Gestioneaza alocarea paginilor de memorie in memoria interna utilizata de o baza de date

15. Urmatoarele interogari SQL se executa pe tablele R(a, b) si S(b, c):

Q1: SELECT \* FROM R INNER JOIN S ON R.b = S.b;

Q2: SELECT \* FROM R LEFT JOIN S ON R.b = S.b;

b) Raspunsul lui Q1 este intotdeauna continut in raspunsul lui Q2

16. In urmatoarele interogari vom presupune ca relatiile…

Q1: SELECT R.a FROM R, S

WHERE R.b = S.b

Q2: SELECT R.a FROM R

WHERE R.b IN (SELECT S.b FROM S.

a) Q1 si Q2 produc acelasi raspuns

17. In cele ce urmeaza rezulateul interogarilor Q1 si Q2 vor fi considerate rezulatatul instructiunii SELECT \* FROM R. De asemenea, structura relatiei R este R(a, b)

Q1. UPDATE R SET b = 20 WHERE a = 10;

SELECT \* FROM R

Q2. DELETE FROM R WHERE a = 10;

INSERT INTO R VALUES(10, 20);

SELECT \* FROM R

c) Raspunsul lui Q2 este intotdeauna continut de Q1

18. Pentru urmatoarele interogari se stie ca R contine un atribut , restul structurii fiind arbitrare

Q1: SELECT COUNT(Distinct b) FROM R

Q2: SELECT CONUT(b) FROM R;

d) Q1 si Q2 produc raspunsuri diferite

19. ?

20. Urmatoarele interogari SQL se executa pe tabelele R(a;b) si S(c;d)

Q1: SELECT a FROM R WHERE b>=ALL(SELECT d FROM S WHERE c=5);

Q2: SELECT a FROM R WHERE b>=ANY(SELECT d FROM S WHERE c=5);

D) Q1 si Q2 produc raspsunsuri diferite

***SUBIECT 1 2016***

1. Relation C is a projection of relation A. Which of the following statemets must be true in all cases where relation C is different from relation A?

d) the degree of C is less than the degree of A

1. In a table in 1NF in which the only candidate key is a single attribute:
2. 2NF may not be violated
3. A table is in 2NF if the table is in 1NF and what other condition is met? Please select the best answer.

d. There are no attributes that are not functionally dependent on the relational’s primary key

1. A table MOVIES in an object-oriented database consists of the attributes title (the primary key), year-produced, and actor-name; actor-name is a repeating group; different movies may have different numbers of actors. The table MOVIES violates the following normal form (choose the lowest one):
2. 1NF
3. In the relation R(A;B;C;D;E) with functional dependencies AB->C, C->B, and D->E the number of superkeys is:

c. 6

1. Which of the following statements about hash-based index files is true?
2. Best suited for equality selections
3. The relation R(A;B;C;D) with functional dependencies A->B, B->C, and BC->A is:
4. Not in 3NF
5. You are making your own table so you can organize information about your ‘Top 100’ movies. You want to include information like Title, Actor(s), Director, Year, Genre etc. Each record in your database will represent:

c. a movie

1. In which data model would I expect to see details of the structure and locations of the files used to keep the contents of a database on disk:
2. The physical model
3. Which of the following statements about disk components is false:
4. Two or more heads can read/write data from/on disk platters on the same time
5. Which of the following descompositions of the schema {A;B;C;D;E;F} are dependency preserving descomposions under the given functional dependencies:

C) {A,B,C,D,F} and {B,C,E} given ABC->DF, BC->E and C->B

1. Consider the relation schema R(A;B;C;D;E) with non-key functional dependencies C,D->E and B->C. Select the strongest statement that can be made about the schema R:
2. R is in the first normal form
3. Given two relations, what is the answer of the following query:

SELECT R.A, SUM(R.B) FROM R WHERE R.A=1 GROUP BY R.A

1. (1,4)
2. What is a primary index?

d. An index on a set of fields that includes the primary key

1. Which of the following is not an alternative of mapping inheritance relationship between 2 classes A and B in tables from relational model?

B) creates tables A,B and a cross-table between them

1. In the following queries, the schema of relation R can be arbitrary.

Q1: (SELECT \* FROM R) UNION (SELECT \* FROM R);

Q2: SELECT \* FROM R;

1. Q1 and Q2 produce the same answer
2. The following SQL queries refer to a relation R(a;b).

Q1: SELECT a FROM R r1 WHERE EXISTS (SELECT \* FROM R WHERE a = r1.b);

Q2: SELECT a FROM R WHERE b=ANY (SELECT a FROM R);

C) the answer to Q2 is always contained in the answer to Q1

1. The following SQL queries refer to a relation R(a;b;c).

Q1: SELECT DISTINCT a, b FROM R;

Q2: SELECT a,b FROM R GROUP BY a,b;

A) Q1 and Q2 produce the same answer

1. In the following queries, the schema of R is arbitrary, although it must include a.

Q1: SELECT \* FROM R;

Q2: SELECT \* FROM R ORDER BY a;

1. Q1 and Q2 produce different answers ??
2. In the following relational algebra expressions, R and S have the same schema, which includes attribute a, but the schemas are otherwise arbitrary.

Q1: Pi a (R) – Pi a (S)

Q2: Pi a (R – S)

Q2 is always contained in Q1

***SUBIECT 2 2016***

1. Pentru ca o relatie aflata in 1NF sa nu fie in a doua forma normala trebuie ca urmatoarea conditie sa fie adevarata:

c. O parte a cheii determina un atribut neprim

1. Pentru ca relatia aflata in 1NF si pentru care singura cheie candidat e formata dintr-un singur atribut putem spune cel mult ca:
2. A doua forma normala este respectata
3. Folosim operatorul algrebric relational (join natural) pentru:

c. Combinarea a doua relatii pe baza atributelor cu acelasi nume

1. Care dintre urmatoarele afirmatii nu reprezinta o proprietate a unui arbore B de grad m?

c. Fiecare nod are cel putin m subarbori

1. In relatia R(A;B;C;D;E) cu dependentele functionale AB->C, C->B, si D->E, numarul supercheilor este:

c. 6

1. Ce element nou este introdus la nivelul definirii unei clase in bazele de date orientate obiect in comparatie cu limbajele de programare orientate-obiect obisnuite? c) Relatii de asociere
2. Despre relatia R(A;B;C;D) cu dependentele functional A->B, B->C, si BC->A putem spune ca:
3. Not in 3NF
4. Un index clustered este un index in care a) Ordinea de stocare a inregistrarilor din tabela indexata este aceeasi cu ordinea memoriarii intrarilor din index
5. Arborii binari exhilibrati au proprietatea ca d) Diferenta dintre inaltimile subarborilor oricarui nod este 1, 0 sau -1
6. Ce este un cilindru al unui hard disk?

c. Multumimea tuturor pistelor(tracks) de pe toate discurile care se afla la aceasi distanta de centrul discului

1. Care din urmatoarele descompuneri ale relatiei {A, B, C, D, E, F} pastreaza dependenta (in raport cu multimea de dependente functionale date)? a) {A, B, C, D, F} si {B, C, E} cu ABC -> DEF, BC -> E, C -> B
2. Fie doua instante de relatii si urmatoarele interogari:

Q1: SELECT R.A FROM R INNER JOIN S ON R.A – S.A EXCEPT SELECT R.A FROM R;

Q2: SELECT R.A FROM R INNER JOIN S ON R.A – S.A INTERSECT SELECT R.A FROM R;

1. Q1 si Q2 au numar diferit de tuple
2. Given the same two relations from previous questions, what is the answer of the following query? SELECT R.A, SUM(R,B) FROM R WHERE R.A=1 GROUP BY R.A b) (1,4)
3. Ce este un index primar (primary index)?

d) Un index definit pe un set de campuri ce includ cheia primara

***SUBIECT 3***

1. What is a logical data independence? d) Changes made in conceptual schema of a database will not affect external schemas
2. Which of the following is not acriteria of use databases for your system c) Low-Level Data access
3. Which of the following statements about dense-sparse indexes is false b) A dense index must be clustered
4. Which of the following is a corect example of a query that finds rows in table T which has a NULL in their C column? d) SELECT \* FROM T WHERE C IS NULL;
5. Given the instance of two relations: what is the result of this query: Pi A(R x cu cerc S)
6. A: 1,3

6.?

7.The relation R(A;B;C;D) with dependencies AB->C, ABC->D and AC->->B is:

8.Which of the following sets of FDs are defined for a relation with schema R(A,B,C,D) having primary key AB and under which R is in 1NF but not 2NF.

d) A-> CD, B-> CD

9.Why are some functional dependencies called trivial?

b) their RHS attributes are included in LHS attributes

10.Which of the following statements is not true when a page is pinned in the buffer pool?

b) The page is locked and cannot be accessed by another requestors

11. A relation has a relational schema {A,B,C}. The number of elements in Dom(A) is 3, in Dom(B) is 4 and in Dom(C) is 4. The maximum number of tuples that this relation can ever have is:

C) 48( 3\*4\*4 )

1. Which of the following aggregate functions produces the smallest value in the query “SELECT <aggregate function> FROM NUMBERS;” where NUMBERS is the table shown below?

A) AVG(NUM)

13. With which of the following functional dependencies is the relation compatible?

a) AB -> C

14. Are foreign key allowed to have null values? b) Yes because there are situations in which such kind of information is not avaialable

15. Which of the following best describes ‘seek time’ term?

a) The time taken to move the disk heads to the track on which a desired block is located

16. The following SQL queries refer to relations R(a,b) and S(b,c):

Q1: SELECT \* FROM R INNER JOIN S;

Q2: SELECT \* FROM R LEFT JOIN S;

1. The answer to Q1 is always contained in the answer of Q2

17. In the following, the results of Q1, Q2 should be taken to be the result of the final SELECT \* FROM R. Assume taht the scheme of relation R is R(a,b).

Q1: UPDATE R SET b = 20 WHERE a = 10;

SELECT \* FROM Rl

Q2: DELE FROM R WHERE a = 10;

INSERT INTO R VALUES(10, 20);

SELECT \* FROM R;

c) The answer to Q2 is always contained in the answer to Q1

18. In the following R has attribute b, but its schema is otherwise not specified, not is it relevant:

Q1: SELECT COUNT (DISTINCT b) FROM R;

Q2: SELECT COUNT (b) FROM R;

d) Q! and Q2 produce different answers.

19. In the following expressions of relational algebra, the relation R has schema R(a;b).

Q1: Pi a (R) X Pi b (R)

Q2: Pi a,d ( R X cu cerc (conditionat de( R.b =! S.c) ) q(S(a->c, b->d), R))

d) Q1 and Q2 produce different answers

20.In the following, you may assume relations R(a, b) and S(b, c) have no NULL’s but may have duplicates.

Q1: SELECT R.a FROM R.S

WHERE R.b = S.b

Q2: SELECT R.a FROM R

WHERE R,b IN (

SELECT S.b FROM S);

a) Q1 and Q2 produce the same answer

***SUBIECT 4 2015***

1. Which of the following sets of FDs are defined for a relation with schema R(A, B, C, D) having primary key AB and under which R is in 2 NF but not 3NF? d) A -> B, B -> C, C -> D
2. In a table in 1 NF in which the only candidate key is a single attribute: a) 2 NF may not be violated
3. A violation of BCNF is typical of the following condition(s) on a table:

c)The table has two non-overlapping candidate keys

1. A relation R has schema:

CREATE TABLE R(

a INT PRIMARY KEY,

b INT DEFAULT 0,

c INT NOT NULL);

R is currently empty. Which of the following INSERT statements is allowable?

1. INSERT INTO R(a,c) VALUES(1,1)
2. In the ralation R(A, B, C, D, E) with functional dependencies AB -> C, C -> B and D -> E, the number of superkeys is: c) 6
3. Which of the following statements about hash-based index files is true: b) Best suited for equality selections.
4. The relation R(A, B, C, D) with functional dependencies A -> B, B-> C and BC -> A is: a) Not in 3NF
5. Let R(a) be a relation, and let R currently consist of the four tuples (3), (9), (11) and (12). Then the result of the query:

SELECT a FROM R WHERE a>ALL( SELECT a FROM R WHERE a<=10);

Consists on which set of tuples?

1. {(11),(12)}
2. In which data model would I expect to see deatils of the structure and locations of the files used to keep contents of a database on disk b) The physical model
3. Which of the following statements about disk components is false? c) Two or more heads can read/write data from/on disk platters in the same time.
4. Which of the following decompositions of the schema {A, B, C, D, E, F} are dependency preserving decompositions under the given functional dependencies? C) {A, B, C, D, E, F} and {B, C, D} given ABC -> DEF, BC -> E and C -> B
5. Given Two Relations and the following queries: Q1: SELECT R.A FROM INNER JOIN S EXCEPT SELECT R.A FROM R, Q2: SELECT R.A FROM R INNER JOIN S INTERSECT SELECT R.A FROM R b) Q1 and Q2 have different number of tuples
6. Given the same to relations from previous question, what is the answer of following query: SELECT R.A, SUM(R.B) FROM R WHERE R.A = 1 GROUP BY R.A b) (1, 4)
7. What is a primary index? d) An index on set of fields that includes the primary key.
8. Which of the following is not an alternative of mapping inheritance relationship between 2 classes A and B in tables from relational model? b) Create tables A, B and cross-table between them
9. The following queries refer to a relation R(a, b, c)…. Q1: SELECT DISTINCT a, b FROM R; Q2: SELECT a,b FROM R GROUP BY a,b; A) Q1 and Q2 produce the same answer
10. The following queries, the schema R is arbitrary, although it must include a. Q1: SELECT \* FROM R; Q2: SELECT \* FROM R ORDER BY a; d)Q1 and Q2 produce different answers. a sau d?
11. In The following relational algebra expressions R and S have the same schema, which includes attribute a, but the schemas are otherwise arbitrary. Q1: Pi(a) ( R ) Intersectat Pi(a) ( S ) ……….. Q2: Pi(a) ( R intersectat S) a) Q1 and Q2 produce the same answer.
12. R can be arbitrary: Q1: (SELECT \* FROM R) UNION (SELECT \* FROM R); Q2: SELECT \* FROM R; a)Q1 and Q2 produce the same answer
13. relation R(a, b), Q1: SELECT a FROM R r1 WHERE EXISTS(SELECT \* FROM R WHERE a = r1.b); Q2: SELECT a FROM R WHERE b = ANY (SELECT a FROM R); C)The answier to Q2 is always contained in the answer Q1?