Choose the correct answer(s) for the following multiple choice questions. Each question has at least one correct answer.

1-4. Consider the relational schema T[ID1, ID2, ID3, C1, C2, C3, C4] with the primary key {ID1, ID2, ID3}. T has no other candidate keys. Answer questions 1-4 using the legal instance below (*null* represents the *null* value, not a string of characters):

ID1	ID2	ID3	C1	C2	C3	C4
1	1	1	Pe copite iau în fugă fața negrului pământ,	-2	*null*	0
1	1	2	Lănci scînteie lungi în soare, arcuri se întind în vînt,	-1	2	1
1	2	1	Și ca nouri de aramă și ca ropotul de grindeni,	0	*null*	0
1	2	2	Orizontu-ntunecîndu-l, vin săgeți de pretutindeni,	1	*null*	-1
2	1	1	Vîjîind ca vijelia și ca plesnetul de ploaie…	2	4	-1
2	1	2	Urlă cîmpul și de tropot și de strigăt de bătaie.	3	4	-1

1. Given the current data in T, we can conclude that:
a. {C1} is also a key in T
b. there is a NOT NULL constraint defined on C2
c. ID1 is a foreign key referencing a primary key in a different table
d. there is a CHECK constraint defined on ID1 with the definition *CHECK (ID1 <= 3)*
e. none of the above answers is correct.

2. How many records does the following query return?
SELECT AVG(C3)
FROM T
WHERE C2 > 1
GROUP BY ID1, ID2, ID3
HAVING SUM(C2) <= 1
a. 4
b. 3
c. 1
d. 0
e. none of the above answers is correct.

3. When executed on the above instance T:
a. query `SELECT * FROM T WHERE C3>5` returns 4 tuples.
b. query
`SELECT * FROM T WHERE C1 LIKE '_%'`
returns 0 tuples.
c. query
```
SELECT * FROM T WHERE ID1 = ID2
INTERSECT
SELECT * FROM T WHERE ID2 = ID3
```
returns 1 tuple.
d. query
```
SELECT * FROM T t1
WHERE t1.C4 > ALL
      (SELECT t2.C4
      FROM T t2)
```
returns 0 tuples.
e. none of the above answers is correct.

4. Regarding the functional dependencies of T:
a. at least one of the following dependencies is not satisfied by the instance: {ID1, ID2, ID3} → {C1, C2}, {ID1} → {C2}, {C4} → {C2}
b. by examining the instance, we can conclude that at least one of the following dependencies is specified on the schema T: {ID1, ID2} → {C1, C2}, {ID1} → {C2}, {C4} → {C2}
c. at least two of the following dependencies are not satisfied by the instance: {C1} → {ID3}, {ID1, ID2} → {C2}, {ID2, ID3} → {ID1}, {C4} → {C2, C1}
d. by examining the instance, we can conclude that at least two of the following dependencies are specified on the schema T: {C1} → {ID3}, {ID1, ID2} → {C2}, {ID2, ID3} → {ID1}, {C4} → {C2, C1}
e. none of the above answers is correct.

5. According to the conceptual evaluation strategy, in a SELECT query:
a. WHERE is evaluated after SELECT
b. WHERE is evaluated after FROM
c. WHERE is evaluated after GROUP BY
d. WHERE is evaluated after HAVING
e. none of the above answers is correct.

6. In a DBMS, the optimizer:
a. manages space on disk

b. brings pages from the disk into main memory
c. produces an efficient execution plan for query evaluation
d. monitors lock requests
e. none of the above answers is correct.

7. Which of the following represents an SQL operator that can be used in a SELECT query:
a. BISCUIT
b. EXISTS
c. BREXIT
d. COEXISTS
e. none of the above answers is correct.

8. In a B-tree of order 7, a non-terminal node that is not the root has:
a. at least 3 values and at most 6 values
b. at least 3 values and at most 7 values
c. at least 4 values and at most 6 values
d. at least 4 values and at most 7 values
e. none of the above answers is correct.

9. In a SELECT query:
a. FROM can contain a subquery
b. WHERE can contain a subquery
c. HAVING can contain a subquery
d. GROUP BY is evaluated after SELECT, according to the conceptual evaluation strategy
e. none of the above answers is correct.

10. Let R[A, B, C, D, E, F] be a relational schema with no repeating attributes. The keys of R are {A, B, C}, {B, C, D, E}, {E, F}. The following dependency holds: {A, B} → {D}. R is:
a. 1NF
b. 2NF
c. 3NF
d. BCNF
e. none of the above answers is correct.

11. Let C denote the condition *(C1 AND C2) OR (C3 AND C4)*, where C1 evaluates to TRUE, C2 evaluates to NULL, C3 evaluates to NULL, C4 evaluates to TRUE. Then C evaluates to:
a. TRUE
b. FALSE
c. NULL
d. none of the above answers is correct.