

What conclusion will you make based on the obtained value in the given part?

**Options :**

6406532577352. ✖ There is a positive linear relationship between the variables  $X$  and  $Y$ .

6406532577353. ✖ There is a negative linear relationship between the variables  $X$  and  $Y$ .

6406532577354. ✔ There is no linear relationship between the variables  $X$  and  $Y$ .

6406532577355. ✖ We cannot conclude anything.

## DBMS

Section Id :	64065353262
Section Number :	6
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	14
Number of Questions to be attempted :	14
Section Marks :	50
Display Number Panel :	Yes
Section Negative Marks :	0
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653112587
Question Shuffling Allowed :	No
Is Section Default? :	null

**Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 0**

Question Label : Multiple Choice Question

**THIS IS QUESTION PAPER FOR THE SUBJECT "DIPLOMA LEVEL : DATABASE MANAGEMENT SYSTEMS (COMPUTER BASED EXAM)"**

**ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?**

**CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.**

**(IF IT IS NOT THE CORRECT SUBJECT, PLS CHECK THE SECTION AT THE TOP FOR THE SUBJECTS REGISTERED BY YOU)**

**Options :**

6406532577356.  YES

6406532577357.  NO

<b>Sub-Section Number :</b>	2
<b>Sub-Section Id :</b>	640653112588
<b>Question Shuffling Allowed :</b>	Yes
<b>Is Section Default? :</b>	null

**Question Number : 92 Question Id : 640653770505 Question Type : MCQ Is Question**

**Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 3**

Question Label : Multiple Choice Question

Let P and Q be two relations. Let D(P) be a decomposition of P based on a set M of functional dependencies. Let D(Q) be a decomposition of Q based on a set N of functional dependencies. It is known that one among D(P) and D(Q) is in 3NF and the other is in 2NF. In order to correctly classify D(P) and D(Q) as being in 3NF or 2NF, what is the MINIMAL test needed?

**Options :**

6406532577358. ✖ Test whether both are in 3NF

6406532577359. ✖ Test whether both are in 2NF

6406532577360. ✖ Test whether one of them is in 2NF

6406532577361. ✔ Test whether one of them is in 3NF

**Question Number : 93 Question Id : 640653770506 Question Type : MCQ Is Question**

**Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 3**

Question Label : Multiple Choice Question

Let  $R_1(X, Y, Z)$  be a relation. Let  $R_2(P, Q, R, S, Z)$  be another relation with the following functional dependencies:

$$\mathcal{F} = P \rightarrow QR, R \rightarrow S, Z \rightarrow P$$

$R_1$  contains 60 tuples and  $R_2$  contains 100 tuples. What are the maximum and minimum number of tuples possible as output of  $R_1 \bowtie R_2$ ?

**Options :**

6406532577362. ✔ Maximum= 60, Minimum= 0

6406532577363. ✖ Maximum= 100, Minimum= 60

6406532577364. ✖ Maximum= 100, Minimum= 0

6406532577365. ✖ Maximum= 60, Minimum= 40

**Sub-Section Number :** 3

**Sub-Section Id :** 640653112589

**Question Shuffling Allowed :** Yes

**Is Section Default? :** null

**Question Number : 94 Question Id : 640653770507 Question Type : MCQ Is Question**

**Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

Correct Marks : 4

Question Label : Multiple Choice Question

Consider the table Sample as shown below:

A	B	C	D
a1	b1	c1	d1
a1	b2	X	d2
a1	b2	c2	Y
a1	P	Q	d2

If the functional dependency  $B \rightarrow C$  and multivalued dependency  $A \twoheadrightarrow BC$  hold on table Sample, then what will be the values of X, Y, P, and Q?

Options :

6406532577366. ✖ X: c2, Y: d1, P: b2, Q: c2

6406532577367. ✖ X: c2, Y: d2, P: b2, Q: c2

6406532577368. ✖ X: c1, Y: d1, P: b1, Q: c1

6406532577369. ✔ X: c2, Y: d1, P: b1, Q: c1

Sub-Section Number : 4

Sub-Section Id : 640653112590

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 95 Question Id : 640653770508 Question Type : MSQ Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the following table:

CarID	CarName	Country	Price
001	Ferrari	Italy	200000
002	Mercedes	Germany	150000
003	McLaren	UK	120000
004	Aston Martin	UK	120000
005	Alpha Tauri	Italy	200000
006	Koenigsegg	Sweden	500000
007	Alpine	France	300000

Table 1: Cars

Which of the following functional dependencies hold on the **Cars** table instance?

Options :

6406532577370. ✓  $CarID \rightarrow CarName$

6406532577371. ✗  $Price \rightarrow CarName$

6406532577372. ✗  $Country \rightarrow CarName$

6406532577373. ✓  $Country \rightarrow Price$

Question Number : 96 Question Id : 640653770511 Question Type : MSQ Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider a relation  $student(roll\_no, name, marks)$ . If all students have the same marks, then which of the following functional dependency/dependencies cannot be held in the student table?

Options :

6406532577382. ✓  $name \rightarrow marks$

6406532577383. ✖  $marks \rightarrow roll\_no$

6406532577384. ✔  $roll\_no \rightarrow marks$

6406532577385. ✖  $marks \rightarrow name$

Sub-Section Number :	5
Sub-Section Id :	640653112591
Question Shuffling Allowed :	Yes
Is Section Default? :	null

**Question Number : 97 Question Id : 640653770509 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Max. Selectable Options : 0**

Question Label : Multiple Select Question

Consider the relation **Songs**(*Song\_Name*, *Artist*, *Genre*, *Duration*, *Album*) with the following set of functional dependencies.

$\mathcal{F} = \{ \text{Song\_Name} \rightarrow \text{Artist},$   
 $\text{Artist} \rightarrow \text{Genre},$   
 $(\text{Album}, \text{Song\_Name}) \rightarrow \text{Duration} \}$

Which of the following statements is **FALSE** with respect to the information given?

**Options :**

6406532577374. ✔ The relation **Songs** is in 2NF

6406532577375. ✔ The functional dependency  $\text{Artist} \rightarrow \text{Genre}$  is an example of partial dependency

6406532577376. ✖ The relation **Songs** is in 1NF

6406532577377. ✖ The functional dependency  $\text{Song\_Name} \rightarrow \text{Artist}$  violates 2NF

Question Number : 98 Question Id : 640653770510 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the Binary Search Tree (BST) shown in figure 1

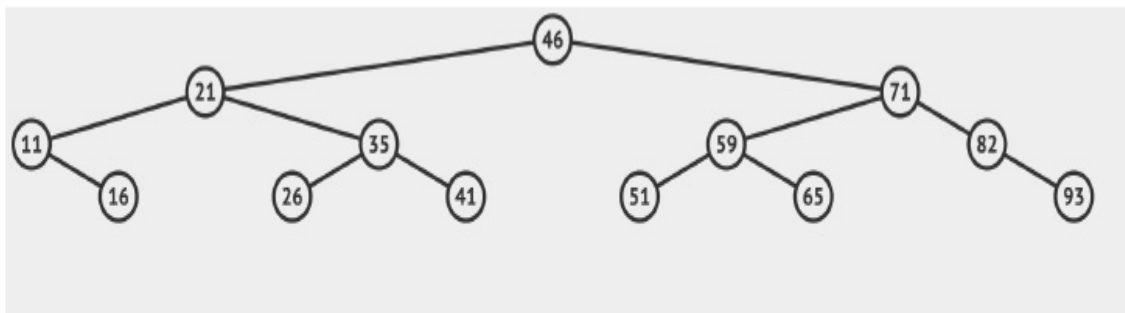


Figure 1: Binary Search Tree (BST)

Which of the following is/are the correct insertion order that will result in the given BST?

Options :

6406532577378. ✓ 46,71,21,11,35,26,16,82,93,59,65,41,51

6406532577379. ✗ 46,71,21,11,26,35,82,93,16,59,65,41,51

6406532577380. ✓ 46,21,71,35,11,26,16,82,93,59,65,41,51

6406532577381. ✗ 46,21,71,35,11,16,26,82,93,41,65,59,51

Sub-Section Number : 6

Sub-Section Id : 640653112592

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 99 Question Id : 640653770512 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

**Correct Marks : 2**

Question Label : Short Answer Question

Consider a relation  $R(A, B, C, D, E, F)$ , having the following set of functional dependencies.

$\mathcal{F} = \{A \rightarrow B, CD \rightarrow E, E \rightarrow F, F \rightarrow B\}$

What is the total number of candidate keys of relation R?

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

1

**Sub-Section Number :** 7

**Sub-Section Id :** 640653112593

**Question Shuffling Allowed :** Yes

**Is Section Default? :** null

**Question Number : 100 Question Id : 640653770514 Question Type : SA Calculator : None**

**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 3**

Question Label : Short Answer Question

Consider a disk having 128 tracks per surface, 512 sectors per track and 256 bytes/sector. If the minimum number of bits required to access a sector is 22, then find out the number of platters required?

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

32



Sub-Section Number :	8
Sub-Section Id :	640653112594
Question Shuffling Allowed :	Yes
Is Section Default? :	null

**Question Number : 101 Question Id : 640653770513 Question Type : SA Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**  
**Correct Marks : 4**

Question Label : Short Answer Question

Consider a string of pending block references in the given order: 4, 5, 2, 5, 3, 4, 2, 5, 3, 4. The system has a buffer with 3 slots. Assume that initially the buffer is empty. If LRU buffer replacement policy is used, then how many misses will occur while referencing all the requested blocks ?

**Response Type :** Numeric  
**Evaluation Required For SA :** Yes  
**Show Word Count :** Yes

**Answers Type :** Equal  
**Text Areas :** PlainText

**Possible Answers :**

9

**Question Number : 102 Question Id : 640653770515 Question Type : SA Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**  
**Correct Marks : 4**

Question Label : Short Answer Question

Consider the table **student** and **course** in the **university** database as shown in below.

ID	name	dept_name
21f11	Ram	CS
21f12	Rakesh	ME
21f13	Pranav	EE
21f14	Rajib	CS
21f15	Vikash	BT

Table 2: **student**

course_id	title	dept_name
C001	DBMS	CS
C002	CAD	ME
C003	Digital	EE
C004	PDSA	CS

Table 3: **course**

Based on the given **student** and **course** table, what will be the output of the Python code given below?

```
import psycopg2
def connectDb(dbname, username, pwd, address, portnum):
    try:
        connection = psycopg2.connect(database = dbname,
                                      user = username,
                                      password = pwd,
                                      host = address,
                                      port = portnum)

        cursor = connection.cursor()
        query = '''SELECT ID FROM student,course
                  EXCEPT ALL
                  SELECT ID FROM student
                  EXCEPT ALL
                  SELECT ID FROM student'''

        cursor.execute(query)
        result = cursor.fetchall()
        count=0
        for row in result:
            count=count+1
        print(count)

        cursor.close()

    except (Exception, psycopg2.DatabaseError) as error:
        print(error)
    finally:
        connection.close()
connectDb("university", "postgres", "root", "127.0.0.1", "5432")
```

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

Sub-Section Number :	9
Sub-Section Id :	640653112595
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Id : 640653770516 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0  
Question Numbers : (103 to 104)

Question Label : Comprehension

Answer the given subquestions based on the below information:

Consider the relation  $R(P, Q, R, S, T, U, V)$  with the following set of functional dependencies.

$$\mathcal{F} = \{S \rightarrow PQ, Q \rightarrow R, P \rightarrow T, T \rightarrow UV, V \rightarrow S\}$$

Sub questions

Question Number : 103 Question Id : 640653770517 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0  
Correct Marks : 4

Question Label : Multiple Choice Question

Which of the following will be a lossless join decomposition of relation  $R$ ?

Options :

6406532577390. ✖  $R_1(P, Q, R), R_2(R, S, T, U, V)$

6406532577391. ✖  $R_1(P, Q, S, U), R_2(R, T, U, V)$

6406532577392. ✔  $R_1(P, Q, R, S), R_2(S, T, U, V)$

6406532577393. ✖  $R_1(P, Q, U), R_2(R, S, T, U, V)$

**Question Number : 104 Question Id : 640653770518 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 2**

Question Label : Multiple Choice Question

What is the highest normal form achievable by the given relation?

**Options :**

6406532577394. ✔ 2NF

6406532577395. ✖ 1NF

6406532577396. ✖ 3NF

6406532577397. ✖ BCNF

<b>Sub-Section Number :</b>	10
<b>Sub-Section Id :</b>	640653112596
<b>Question Shuffling Allowed :</b>	No
<b>Is Section Default? :</b>	null

**Question Id : 640653770519 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0 Question Numbers : (105 to 106)**

Question Label : Comprehension

The sports federation FIA has decided to maintain a database of all the drivers, races and budgets for the 2024 Formula 1 Season. Below is the original database structure designed by FIA:

FormulaOne(*Driver\_ID*, *Driver\_Name*, *Race*, *Points*, *Team\_Name*, *Team\_Budget*)

The functional dependencies applicable to FormulaOne are:

$$\mathcal{F} = \{Driver\_ID \rightarrow Driver\_Name, \\ (Driver\_ID, Race) \rightarrow Points, \\ Driver\_ID \rightarrow Team\_Name, \\ Team\_Name \rightarrow Team\_Budget\}$$

Based on the above data, answer the given subquestions.

### Sub questions

Question Number : 105 Question Id : 640653770520 Question Type : MSQ Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Which of the following functional dependencies violate the condition for the given relation to be in 2 NF?

Options :

6406532577398. ✓  $Driver\_ID \rightarrow Driver\_Name$

6406532577399. ✗  $(Driver\_ID, Race) \rightarrow Points$

6406532577400. ✓  $Driver\_ID \rightarrow Team\_Name$

6406532577401. ✗  $Team\_Name \rightarrow Team\_Budget$

Question Number : 106 Question Id : 640653770521 Question Type : MCQ Is Question

Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

**Correct Marks : 4**

Question Label : Multiple Choice Question

Which of the following decompositions will help to achieve 2 NF?

**Options :**

Table 1: Drivers (*Driver\_ID, Driver\_Name*)

Table 2: Races (*Driver\_ID, Race, Points*)

6406532577402. ✓ Table 3: Teams (*Driver\_ID, Team\_Name, Team\_Budget*)

Table 1: Drivers (*Driver\_ID, Driver\_Name*)

Table 2: Races (*Driver\_ID, Race, Points, Team\_Name*)

6406532577403. ✗ Table 3: Teams (*Team\_Name, Team\_Budget*)

Table 1: Drivers (*Driver\_ID, Driver\_Name, Points*)

Table 2: Races (*Driver\_ID, Race, Points*)

6406532577404. ✗ Table 3: Teams (*Team\_Name, Team\_Budget*)

Table 1: Drivers (*Driver\_ID, Driver\_Name*)

Table 2: Races (*Driver\_ID, Race, Points*)

6406532577405. ✗ Table 3: Teams (*Team\_Name, Team\_Budget, Driver\_Name*)

## PDSA

Section Id :	64065353263
Section Number :	7
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	17
Number of Questions to be attempted :	17
Section Marks :	50
Display Number Panel :	Yes