Questions

DBMS Quiz 2 Revision

5. In Python Postgres database connectivity, the **'cursor.fetchmany()'** method is used to retrieve data from a table. The method **'cursor.fetchmany()'** returns-

<div align="right">[Subendu : MCQ : 2 Marks]</div>

○ A dictionary

○ A tuple

○ List of tuple

○ List of dictionary

Answer : C

6. Consider an instance of **student** Table in the **school_management** database.

roll_no	name	marks
1	Ram	50
2	Rakesh	65
3	Lily	45
4	Pranav	89
5	Emily	99

Table 1: **student**

After executing the Python code below, it is observed that the new tuple didn't get updated in the table. Check the code and find out the possible error and write it down. Note: Write the code in lowercase and without space.

```
import psycopg2
def insertrecord(roll,name,marks):
    conn=None
    try:
        conn=psycopg2.connect(database="school_management",
                              user="postgres",
                              password="root",
                              host="127.0.0.1",
                              port="5432")
        cur=conn.cursor() # create a new cursor
        cur.execute(''' insert into student
        values(%s,%s,%s)''',(roll,name,marks))
        #write down the code here
        cur.close()
    except(Exception, psycopg2.DatabaseError) as error:
        print(error)
    finally:
        if conn is not None:
            conn.close()
insertrecord(6,"Pranav",89)
```
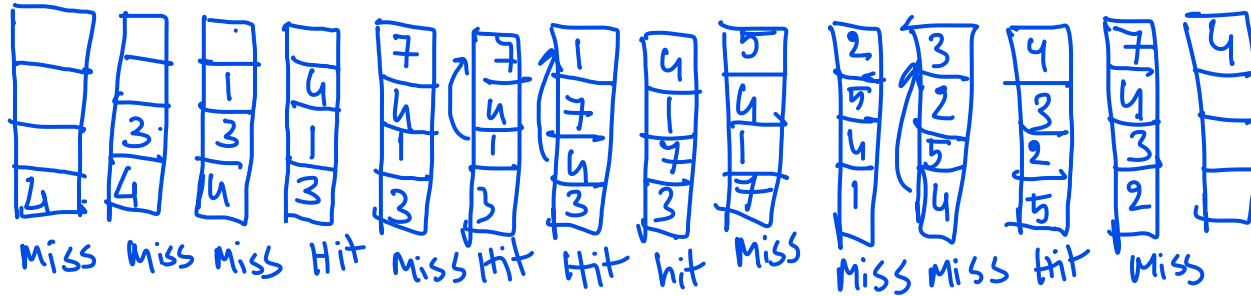
Answer : conn.commit()

11. Consider a sequence of pending block references in the given order: [Ashlesha : Wk - 8 : NAT : 4 pts]

$$4, 3, 1, 4, 7, 7, 1, 4, 5, 2, 3, 4, 7, 4, 2, 4, 1, 4, 2, 5$$

The system has a buffer with 4 slots. Assume that initially, the buffer is empty. If the Least Recently Used (LRU) buffer replacement policy is used, then how many misses/page fault will occur while referencing all the requested blocks ?

Answer : 10

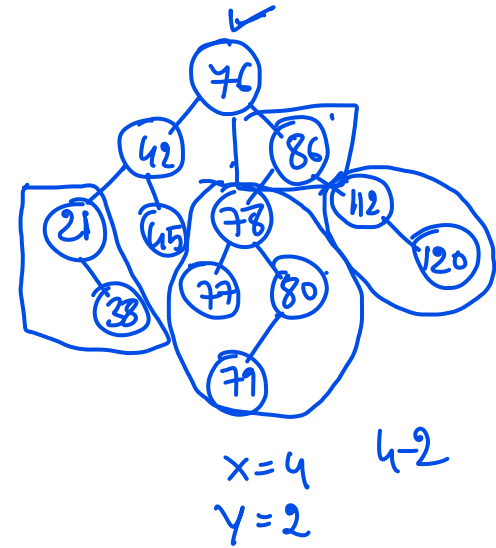12. The following numbers are inserted into an empty binary search tree in the given order.

76, 86, 42, 112, 120, 21, 78, 38, 45, 80, 77, 79

Let **X, Y** denote the number of nodes in the left and right sub tree of node 86 respectively.
Find the value of $|X - Y|$.   [Ashlesha : Wk - 8 : MCQ : 3 pts]

○ 2

○ 3

○ 4

○ 5

Answer: A

13. Which of the following are correct about a linked list ? [Ashlesha: Wk-8 : MSQ : 2 pt]

○ Stores data in contiguous memory location always

☑ Each node contains a *link* to another node

○ Allows random access using its index which is fast

☑ Flexible in size

Answer: B and D

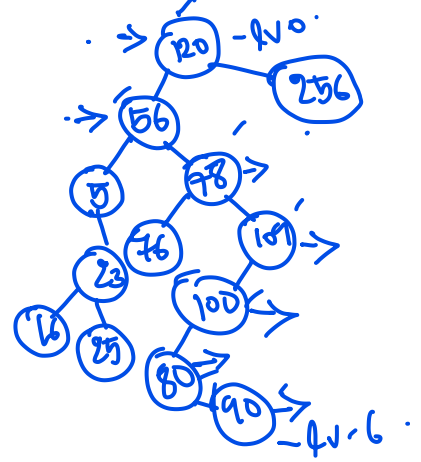14. Consider the following elements added to a data structure, Y in the given order.

$$120, 56, 78, 109, 5, 100, 80, 76, 23, 90, 256, 16, 25$$

Identify the correct statement(s).   [Ashlesha: wk: 8: MSQ : 4 pts]

- If Y = Stack, then Y(top) = 25
- If Y = Queue, then the element to be deleted first is 25
- If Y = Array, the time to search 5, would be linear time.
- If Y = BST, the number of comparisons to search 90, would be 7

Answer: A, C and D

15. Consider a disk having 16 platters, 2 surfaces per platter, 16 tracks per surface, 2048 sectors per track and 512 bytes/sector. Let **A** denote the minimum number of bits required to access a sector, **B** denote the number of cylinders required in the disk and **C** denote the storage capacity of the disk. Find the appropriate triplet for <**A, B, C**>.

[Ashlesha : Wk 8 : 4 pts]

- ⊗ <20, 20, 512 MB>
- ⊗ <16, 20, 512 GB >
- ○ <20, 16, 512 GB> .
- ✓ <20, 16, 512 MB>

Answer: D

(handwritten annotations)

v. Imp.

no. of sectors = $2 \times 16 \times 16 \times 2048$
$= 2 \times 2^4 \times 2^4 \times 2^{11}$
$= \boxed{2^{20}}$ ✓

$8 \to 3$ bits.

$1 \times 16 \to 16$
$0 \to 16$
$0 \to 1$

2 bits $\to 2^2$ comb.
3 bits $\to 2^3$ combos

bits reqd $\to 20$ bits.

$\dfrac{2^{20}}{} \times 2^9$.

$= 2^9$ MB
$= 512$ MB

17. Consider the given statements.

    Statement 1 If there are n nodes in a binary tree, the maximum height of the binary tree is $n - 1$.

    Statement 2 If a binary tree has height h, the maximum number of nodes in the tree will be 2^{h+1}.

    ○ Both statements are correct.

    ○ Both statements are wrong.

    ○ Statement 1 is wrong, and statement 2 is correct.

    ✓ Statement 1 is correct, and statement 2 is wrong.

    Answer: Option D

    $2^{h+1} - 1$.

7. Consider a string of pending block references in the order given: $4, 6, 4, 1, 3, 2, 4, 1, 4, 2$. The system has a buffer with 4 slots. Assume that initially, the buffer is empty. If LRU buffer replacement policy is used, then what will be the value of the following expression?

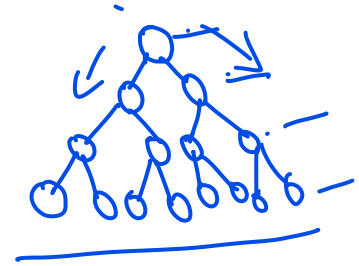Number of misses − Number of hits

[NAT: 4 points]

Answer: 0

8. Consider a binary search tree consisting of 15 elements. Let m be the maximum height possible for a given binary search tree, and n be the minimum height possible for a given binary search tree.

What will be the value of $m - n$? [NAT : 3 Marks]

Answer: 11

max height = 14
min height = 3

9. Consider a magnetic disk with 4 platters, 2 surfaces per platter, 1024 tracks per surface, and 2048 sectors per track, with a disk capacity of 8 GB. Find the capacity of one sector.

[MCQ: 3 Marks]

○ 2048 bytes per sector

○ 1024 bytes per sector

No. of sectors $= 2 \times 4 \times 1024 \times 2048$

$= 2 \times 2^2 \times 2^{10} \times 2^{11}$

$= 2^{24}$

$8 GB$
$= 2^3 \times 2^{30} B$
$= 2^{33} B$.

$\dfrac{2^{33}}{2^{24}} = 2^9$ bytes/sector.

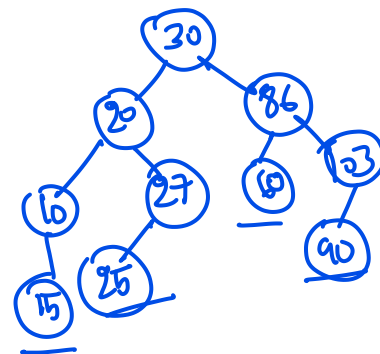✓ 512 bytes per sector

○ 256 bytes per sector

Answer : C

19. Construct a binary search tree by inserting the following elements in the given order 30,20, 27, 86, 103, 25, 60, 90, 10, 15. Find out the elements present in the leaf nodes of the constructed binary search tree.

Choose the correct option. [Piyush:MCQ: 2 Marks]

✓ 15, 25, 60,90

○ 15, 25,90

○ 10,27,103, 20,86

○ 10,27,103

Answer: Option A

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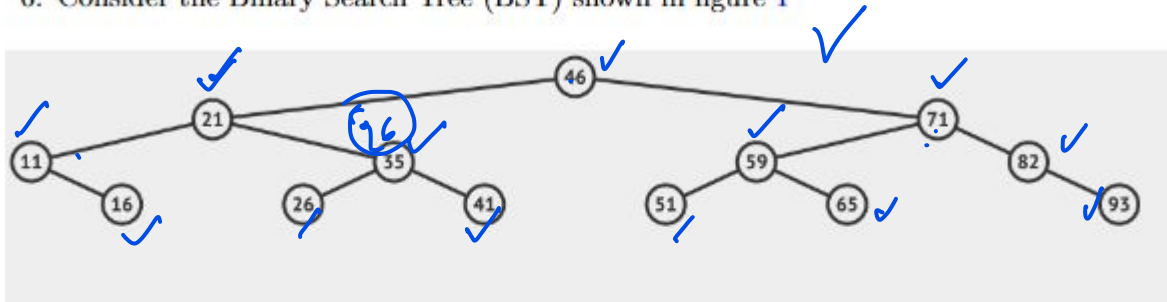

Figure 1: Binary Search Tree (BST)

Which of the following is/are the correct insertion order that will result in the given BST?   [MSQ 4 points]

- 46,71,21,11,35,26,16,82,93,59,65,41,51
- 46,71,21,11,26,35,82,93,16,59,65,41,51
- 46,21,71,35,11,26,16,82,93,59,65,41,51
- 46,21,71,35,11,16,26,82,93,41,65,59,51

Answer: A and C

9. 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 ? [NAT: 4 marks]

Answer: 9

4. The following numbers are inserted into an empty binary search tree in the given order.

$$24, 60, 48, 12, 72, 96, 36, 108, 84$$

Let X, Y denote the number of nodes in the left and right sub tree of node 60 respectively. Find the value of $|X - Y|$. [MCQ: 4 marks]

○ 2

○ 3

○ 4

○ 5

Answer: Option A

18. The following numbers are inserted into an empty binary search tree in the given order: 27, 23, 33, 49, 51, 92, 83, 10, 78. What is the height of the resulting binary search tree?

Answer: 6