# Questions from Board Examination

## Unit I - Computational Thinking and Programming – 2

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</table>
| 1.     | State True or False.  
         "Identifiers are names used to identify a variable, function in a program". | 1 |
| 2.     | Which of the following is a valid keyword in Python?  
         (a) false  
         (b) return  
         (c) non_local  
         (d) none | 1 |
| 3.     | Given the following Tuple  
         Tup= (10, 20, 30, 50)  
         Which of the following statements will result in an error?  
         (a) print(Tup[0])  
         (b) Tup.insert (2,3)  
         (c) print(Tup[1:2])  
         (d) print(len(Tup)) | 1 |
| 4.     | Consider the given expression:  
         5<10 and 12>7 or not 7>4  
         Which of the following will be the correct output, if the given expression is evaluated?  
         (a) True  
         (b) False  
         (c) NONE  
         (d) NULL | 1 |
| 5.     | Select the correct output of the code:  
         S= "Amrit Mahotsav @ 75"  
         A=S.partition (" ")  
         print (a)  
         (a) ( 'Amrit Mahotsav','@','75')  
         (b) ['Amrit','Mahotsav','@','75']  
         (c) ( 'Amrit', 'Mahotsav @ 75')  
         (d) ( 'Amrit', '', 'Mahotsav @ 75') | 1 |
| 6.     | Which of the following mode keeps the file offset position at the end of the file?  
         (a) r+  
         (b) r  
         (c) w  
         (d) a | 1 |
| 7.     | Fill in the blank.  
         _____ function is used to arrange the elements of a list in ascending order.  
         (a) sort()  
         (b) arrange()  
         (c) ascending()  
         (d) asort() | 1 |
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<tr>
<td>8.</td>
<td>Which of the following operators will return either True or False?</td>
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<td></td>
<td>(a) +=</td>
<td>(b) !=</td>
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<td></td>
<td>(c) =</td>
<td>(d) *=</td>
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<td>9.</td>
<td>Which of the following statement(s) would give an error after executing</td>
<td></td>
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<td></td>
<td>the following code?</td>
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<td></td>
<td>Stud={&quot;Murugan&quot;:100, &quot;Mithu&quot;:95} # Statement 1</td>
<td></td>
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<td></td>
<td>print (Stud[95])</td>
<td># Statement 2</td>
</tr>
<tr>
<td></td>
<td>Stud ['Murugan']=99</td>
<td># Statement 3</td>
</tr>
<tr>
<td></td>
<td>print(Stud.pop())</td>
<td># Statement 4</td>
</tr>
<tr>
<td></td>
<td>print(Stud)</td>
<td># Statement 5</td>
</tr>
<tr>
<td></td>
<td>(a) Statement 2</td>
<td>(b) Statement 3</td>
</tr>
<tr>
<td></td>
<td>(c) Statement 4</td>
<td>(d) Statements 2 and 4</td>
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<tr>
<td>10.</td>
<td>The syntax of seek( ) is:</td>
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<td>file_object.seek(offset[, reference_point])</td>
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<td></td>
<td>What is the default value of reference_point?</td>
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<td></td>
<td>(a) 0</td>
<td>(b) 1</td>
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<td></td>
<td>(c) 2</td>
<td>(d) 3</td>
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<tr>
<td>11.</td>
<td>What will the following expression be evaluated to in Python?</td>
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<td></td>
<td>print(4+3*5/3-5%2)</td>
<td></td>
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<td></td>
<td>(a) 8.5</td>
<td>(b) 8.0</td>
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<td></td>
<td>(c) 10.2</td>
<td>(d) 10.0</td>
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<td>12.</td>
<td>Which function returns the sum of all elements of a list?</td>
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<td></td>
<td>(a) count()</td>
<td>(b) sum()</td>
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<td></td>
<td>(c) total()</td>
<td>(d) add()</td>
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<td>13.</td>
<td><strong>Assertion (A):</strong> To use a function from a particular module, we need</td>
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<td>to import the module.</td>
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<td><strong>Reason (R):</strong> import statement can be written anywhere in the program,</td>
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<tr>
<td></td>
<td>before using a function from that module.</td>
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<td>14.</td>
<td><strong>Assertion (A):</strong> A stack is a LIFO structure.</td>
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<td><strong>Reason (R):</strong> Any new element pushed into the stack always gets</td>
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<td>positioned at the index after the last existing element in the stack.</td>
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<td>15.</td>
<td>Atharva is a Python programmer working on a program to find and return</td>
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<td>the maximum value from the list. The code written below has syntactical</td>
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<td>errors. Rewrite the correct code and underline the corrections made.</td>
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<td>def max_num (L) :</td>
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<td></td>
<td>max=L(0)</td>
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<tr>
<td></td>
<td>for a in L :</td>
<td></td>
</tr>
<tr>
<td></td>
<td>if a &gt; max</td>
<td></td>
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<tr>
<td></td>
<td>max=a</td>
<td></td>
</tr>
<tr>
<td></td>
<td>return max</td>
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</tbody>
</table>

2
<p>| | | | |</p>
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| **16.** | (a) Given is a Python list declaration:  
\[ \text{Listofnames}=["Aman","Ankit","Ashish","Rajan","Rajat"] \]  
Write the output of:  
\[
\text{print} (\text{Listofnames} [-1:-4:-1])
\]
(b) Consider the following tuple declaration:  
\[ \text{tup1}=(10,20,30,(10,20,30),40) \]  
Write the output of:  
\[
\text{print} (\text{tup1.index}(20))
\|
| **17.** | Write the output of the code given below:  
\[
\text{def short_sub (lst,n):}
\text{   for i in range (0,n):}
\text{     if len (lst)>4:}
\text{       lst[i]=lst[i]+lst[i]}
\text{     else:}
\text{       lst[i]=lst[i]}
\text{subject=['CS','HINDI','PHYSICS','CHEMISTRY','MATHS']}\n\text{short_sub(subject,5)}
\text{print(subject)}
\] |
| **18.** | Write the output of the code given below:  
\[
\text{a }=30\n\text{def call (x):}
\text{   global a}
\text{   if a\%2==0:}
\text{     x+=a}
\text{   else:}
\text{     x-=a}
\text{return x}
\text{x=20}\n\text{print(call(35),end="#")}\n\text{print(call(40),end= "@")}
\] |
19. Write the definition of a Python function named `LongLines()` which reads the contents of a text file named 'LINES.TXT' and displays those lines from the file which have at least 10 words in it. For example, if the content of 'LINES.TXT' is as follows:

Once upon a time, there was a woodcutter
He lived in a little house in a beautiful, green wood.
One day, he was merrily chopping some wood.
He saw a little girl skipping through the woods, whistling happily.
The girl was followed by a big gray wolf.

Then the function should display output as:
He lived in a little house in a beautiful, green wood.
He saw a little girl skipping through the woods, whistling happily.

20. Write a function `count_Dwords()` in Python to count the words ending with a digit in a text file "Details.txt".

Example:
If the file content is as follows:
On seat2 VIP1 will sit and
On seat1 VVIP2 will be sitting
Output will be:
Number of words ending with a digit are 4

21. Write a function `EOReplace()` in Python, which accepts a list L of numbers. Thereafter, it increments all even numbers by 1 and decrements all odd numbers by 1.

Example:
If Sample Input data of the list is:
L = [10, 20, 30, 40, 35, 55]
Output will be:
L = [11, 21, 31, 41, 34, 54]
22. (a) A list contains following record of customer:
   [Customer_name, Room Type]
   Write the following user defined functions to perform given
   operations on the stack named 'Hotel':
   (i) Push_Cust() – To Push customers’ names of those customers
       who are staying in 'Delux' Room Type.
   (ii) Pop_Cust() – To Pop the names of customers from the stack
       and display them. Also, display “Underflow” when there are no
       customers in the stack.

   For example:
   If the lists with customer details are as follows:
   ["Siddarth", "Delux"]
   ["Rahul", "Standard"]
   ["Jerry", "Delux"]
   The stack should contain
   Jerry
   Siddharth
   The output should be:
   Jerry
   Siddharth
   Underflow

23. Write a function in Python, Push (Vehicle) where, Vehicle is a
dictionary containing details of vehicles – {Car_Name: Maker}.
The function should push the name of car manufactured by ‘TATA’
(including all the possible cases like Tata, TaTa, etc.) to the stack.

   For example:
   If the dictionary contains the following data:
   Vehicle={"Santro":"Hyundai","Nexon":"TATA","Safari":"Tata"}
   The stack should contain
   Safari
   Nexon

24. What possible output(s) are expected to be displayed on screen at the
time of execution of the following program:
    import random
    M=[5,10,15,20,25,30]
    for i in range(1,3):
        first=random.randint(2,5)- 1
        sec=random.randint(3,6)- 2
        third=random.randint(1,4)
        print(M[first],M[sec],M[third],sep=""#")

    (i) 10#25#15 (ii) 5#25#20
        20#25#25 25#20#15

    (iii) 30#20#20 (iv) 10#15#25#
        20#25#25 15#20#10#
25. (a) Write one difference between CSV and text files. Write a program in Python that defines and calls the following user defined functions:
   (i) COURIER_ADD(): It takes the values from the user and adds the details to a csv file 'courier.csv'. Each record consists of a list with field elements as cid, s_name, Source, destination to store Courier ID, Sender name, Source and destination address respectively.
   (ii) COURIER_SEARCH(): Takes the destination as the input and displays all the courier records going to that destination.

   OR

(b) Why it is important to close a file before exiting? Write a program in Python that defines and calls the following user defined functions:
   (i) Add_Book(): Takes the details of the books and adds them to a csv file 'Book.csv'. Each record consists of a list with field elements as book_ID, B_name and pub to store book ID, book name and publisher respectively.
   (ii) Search_Book(): Takes publisher name as input and counts and displays number of books published by them.

26. Shreyas is a programmer, who has recently been given a task to write a user defined function named write_bin() to create a binary file called Cust_file.dat containing customer information — customer number (c_no), name (c_name), quantity (qty), price (price) and amount (amt) of each customer. The function accepts customer number, name, quantity and price. Thereafter, it displays the message ‘Quantity less than 10..... Cannot SAVE’, if quantity entered is less than 10. Otherwise the function calculates amount as price * quantity and then writes the record in the form of a list into the binary file.

```python
import pickle
def write_bin():
    bin_file=_____  #Statement 1
    while True:
        c_no=int(input("enter customer number"))
        c_name=input("enter customer name")
        qty=int(input("enter qty"))
        price=int(input("enter price"))
        if _____  #Statement 2
            print("Quantity less than 10..Cannot SAVE")
        else:
            amt=price * qty
            c_detail=[c_no,c_name,qty,price,amt]  #Statement 3
            ans=input("Do you wish to enter more records y/n")
            if ans.lower()=='n':
                _____  #Statement 4
                _____  #Statement 5
                _____  #Statement 6
```
(i) Write the correct statement to open a file 'Cust_file.dat' for writing the data of the customer.
(ii) Which statement should Shreyas fill in Statement 2 to check whether quantity is less than 10.
(iii) Which statement should Shreyas fill in Statement 3 to write data to the binary file and in Statement 4 to stop further processing if the user does not wish to enter more records.

OR

(OPTION FOR PART (iii) ONLY)

(iii) What should Shreyas fill in Statement 5 to close the binary file named Cust_file.dat and in Statement 6 to call a function to write data in binary file?

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| 1.    | State True or False.  
       "Comments are not executed by interpreter." | 1    |
| 2.    | Which of the following is **not** a sequential datatype in Python?        | 1    |
|       | (a) Dictionary                                                           |      |
|       | (b) String                                                               |      |
|       | (c) List                                                                 |      |
|       | (d) Tuple                                                                |      |
| 3.    | Given the following dictionary                                           | 1    |
|       | Day={1: "Monday", 2: "Tuesday", 3: "Wednesday"}                         |      |
|       | Which statement will return "Tuesday".                                   |      |
|       | (a) Day.pop ()                                                           |      |
|       | (b) Day.pop (2)                                                          |      |
|       | (c) Day.pop (1)                                                          |      |
|       | (d) Day.pop ("Tuesday")                                                 |      |
4. Consider the given expression:
   \[ 7 < 4 \text{ or } 6 > 3 \text{ and not } 10 == 10 \text{ or } 17 > 4 \]
   Which of the following will be the correct output if the given expression is evaluated?
   (a) True
   (b) False
   (c) NONE
   (d) NULL

5. Select the correct output of the code:
   ```python
   S = "Amrit Mahotsav @ 75"
   A = S.split(" ", 2)
   print(A)
   ```
   (a) ('Amrit', 'Mahotsav', '@', '75')
   (b) ['Amrit', 'Mahotsav', '@ 75']
   (c) ('Amrit', 'Mahotsav', '@ 75')
   (d) ['Amrit', 'Mahotsav', '@', '75']

6. Which of the following modes in Python creates a new file, if file does not exist and overwrites the content, if the file exists?
   (a) r+
   (b) r
   (c) w
   (d) a

7. Fill in the blank:
   ______ is not a valid built-in function for list manipulations.
   (a) count()
   (b) length()
   (c) append()
   (d) extend()

8. Which of the following is an example of identity operators of Python?
   (a) is
   (b) on
   (c) in
   (d) not in
9. Which of the following statement(s) would give an error after executing the following code?

```python
S=\"Happy\"  # Statement 1
print(S*2)   # Statement 2
S+=\"Independence\"  # Statement 3
S.append(\"Day\")  # Statement 4
print(S)      # Statement 5
(a) Statement 2      (b) Statement 3
(c) Statement 4      (d) Statement 3 and 4
```

10. The correct syntax of `tell()` is:

(a) `tell.file_object()`  
(b) `file_object.tell()`  
(c) `tell.file_object(1)`  
(d) `file_object.tell(1)`

11. What will the following expression be evaluated to in Python?

```python
print(6/3 + 4**3)//8-4)
(a) 6.5  
(b) 4.0  
(c) 6.0  
(d) 4
```

12. Which of the following functions is a valid built-in function for both list and dictionary datatype?

(a) `items()`  
(b) `len()`  
(c) `update()`  
(d) `values()`

13. **Assertion (A):** In Python, a stack can be implemented using a list.  
**Reasoning (R):** A stack is an ordered linear list of elements that works on the principle of First In First Out (FIFO).

14. **Assertion (A):** `readlines()` reads all the lines from a text file and returns the lines along with newline as a list of strings.  
**Reasoning (R):** `readline()` can read the entire text file line by line without using any looping statements.
15. Ravi, a Python programmer, is working on a project in which he wants to write a function to count the number of even and odd values in the list. He has written the following code but his code is having errors. Rewrite the correct code and underline the corrections made.

```python
define EOCOUNT(L):
    even_no=odd_no=0
    for i in range(0,len(L))
        if L[i]%2==0:
            even_no+=1
        else:
            odd_no+=1
    print(even_no, odd_no)
```

16. (a) Given is a Python string declaration:

```
NAME = "Learning Python is Fun"
```
Write the output of: `print(NAME[-5:-10:-1])`

(b) Write the output of the code given below:

```python
dict1={1: ["Rohit",20], 2: ["Siya",90]}
dict2={1: ["Rahul",95], 5: ["Rajan",80]}
dict1.update(dict2)
print(dict1.values())
```

17. Write the output of the Python code given below:

```python
g=0
def fun1(x,y):
    global g
    g=x+y
    return g
def fun2(m,n):
    global g
    g=m-n
    return g
k=fun1(2,3)
fun2(k,7)
print(g)
```
18. Write the output of the Python code given below:
   ```python
da=15
def update(x):
    global a
    a+=2
    if x%2==0:
        a*=x
    else:
        a//=x
    a=a+5
    print(a,end="$")
update(5)
print(a)
```  

19. Write a function in Python that displays the book names having ‘Y’ or ‘y’ in their name from a text file “Bookname.txt”.  
   Example:
   If the file ‘Bookname.txt’ contains the names of following books:
   One Hundred Years of Solitude
   The Diary of a Young Girl
   On the Road
   After execution, the output will be:
   One Hundred Years of Solitude
   The Diary of a Young Girl

20. Write a function `RevString()` to read a textfile “Input.txt” and prints the words starting with ‘O’ in reverse order. The rest of the content is displayed normally.
   Example:
   If content in the text file is:
   UBUNTU IS AN OPEN SOURCE OPERATING SYSTEM
   Output will be:
   UBUNTU IS AN NEPO SOURCE GNITAREPO SYSTEM
   (words ‘OPEN’ and ‘OPERATING’ are displayed in reverse order)
21. Write a function `search_replace()` in Python which accepts a list \( L \) of numbers and a number to be searched. If the number exists, it is replaced by 0 and if the number does not exist, an appropriate message is displayed.

Example:
\[ L = [10, 20, 30, 10, 40] \]
Number to be searched = 10
List after replacement:
\[ L = [0, 20, 30, 0, 40] \]

22. A list contains following record of course details for a University:

\[ \text{[Course\_name, Fees, Duration]} \]

Write the following user defined functions to perform given operations on the stack named 'Univ':

(i) \text{Push\_element()} – To push an object containing the Course\_name, Fees and Duration of a course, which has fees greater than 100000 to the stack.

(ii) \text{Pop\_element()} – To pop the object from the stack and display it. Also, display “Underflow” when there is no element in the stack.

For example:
If the lists of courses details are:

[“MCA”,200000,3]
[“MBA”,500000,2]
[“BA”,100000,3]

The stack should contain:

[“MBA”,500000,2]
[“MCA”,200000,3]
23. What possible output(s) are expected to be displayed on screen at the time of execution of the following code?

```python
import random
S=["Pen","Pencil","Eraser","Bag","Book"]
for i in range (1,2):
    f=random.randint(i,3)
    s=random.randint(i+1,4)
    print(S[f],S[s],sep=" ")
```

Options:
(I) Pencil:Book
(II) Pencil:Book
    Eraser:Bag
(III) Pen:Book
    Bag:Book
(IV) Bag:Eraser

24. Predict the output of the code given below:
```python
text="LearningCS"
L=len(text)
ntext=""
for i in range (0,L):
    if text[i].islower():
        ntext=ntext+text[i].upper()
    elif text[i].isalnum():
        ntext=ntext+text[i-1]
    else:
        ntext=ntext+'&'
print(ntext)
```
25. Write a point of difference between append (a) and write (w) modes in a text file.

Write a program in Python that defines and calls the following user defined functions:

(i) **Add_Teacher()**: It accepts the values from the user and inserts record of a teacher to a csv file ‘Teacher.csv’. Each record consists of a list with field elements as **T_id**, **Tname** and **desig** to store teacher ID, teacher name and designation respectively.

(ii) **Search_Teacher()**: To display the records of all the PGT (designation) teachers.

26. Write one point of difference between **seek()** and **tell()** functions in file handling. Write a program in Python that defines and calls the following user defined functions:

(i) **Add_Device()**: The function accepts and adds records of the peripheral devices to a csv file ‘peripheral.csv’. Each record consists of a list with field elements as **P_id**, **P_name** and **Price** to store peripheral device ID, device name, and price respectively.

(ii) **Count_Device()**: To count and display number of peripheral devices, whose price is less than ₹ 1000.
Atharva is a programmer, who has recently been given a task to write a Python code to perform the following binary file operation with the help of a user defined function/module:

- Copy_new(): to create a binary file `new_items.dat` and write all the item details stored in the binary file, `items.dat`, except for the item whose item_id is 101. The data is stored in the following format:
  
  ```
  {item_id:[item_name,amount]}
  ```

```python
import __________  # Statement 1

def Copy_new():
    f1=___________  # Statement 2
    f2=___________  # Statement 3

    item_id=int(input("Enter the item id"))
    item_detail=_________  # Statement 4

    for key in item_detail:
        if __________:  # Statement 5
            pickle._________  # Statement 6

    f1.close()
    f2.close()
```

He has succeeded in writing partial code and has missed out certain statements. Therefore, as a Python expert, help him to complete the code based on the given requirements:
(i) Which module should be imported in the program? (Statement 1)

(ii) Write the correct statement required to open the binary file "items.dat". (Statement 2)

(iii) Which statement should Atharva fill in Statement 3 to open the binary file "new_items.dat" and in Statement 4 to read all the details from the binary file "items.dat".

    OR (Option for part iii only)

(iii) What should Atharva write in Statement 5 to apply the given condition and in Statement 6 to write data in the binary file "new_items.dat".
# Questions from Board Examinations

## Unit II - Computer Networks

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<th>Mark</th>
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| 1.     | Fill in the blank:  
  ____ is used for point-to-point communication or unicast communication such as radar and satellite.  
  (a) INFRARED WAVES  
  (b) BLUETOOTH  
  (c) MICROWAVES  
  (d) RADIAOWAVES | 1    |
| 2.     | (a) Differentiate between wired and wireless transmission.  
  OR  
  (b) Differentiate between URL and domain name with the help of an appropriate example. | 2    |
| 3.     | (a) Write the full forms of the following:  
  (i) HTML  
  (ii) TCP  
  (b) What is the need of Protocols? | 2    |
| 4.     | Quickdev, an IT based firm, located in Delhi is planning to set up a network for its four branches within a city with its Marketing department in Kanpur. As a network professional, give solutions to the questions (i) to (v), after going through the branches locations and other details which are given below:  

![Diagram](image)

Distance between various branches is as follows:  

<table>
<thead>
<tr>
<th>Branch</th>
<th>Distance</th>
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</thead>
<tbody>
<tr>
<td>Branch A to Branch B</td>
<td>40 m</td>
</tr>
<tr>
<td>Branch A to Branch C</td>
<td>80 m</td>
</tr>
<tr>
<td>Branch A to Branch D</td>
<td>65 m</td>
</tr>
<tr>
<td>Branch B to Branch C</td>
<td>30 m</td>
</tr>
<tr>
<td>Branch B to Branch D</td>
<td>35 m</td>
</tr>
<tr>
<td>Branch C to Branch D</td>
<td>15 m</td>
</tr>
<tr>
<td>Delhi Branch to Kanpur</td>
<td>300 km</td>
</tr>
</tbody>
</table>
Distance between various branches is as follows:

<table>
<thead>
<tr>
<th>Branch</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Branch A to Branch B</td>
<td>40 m</td>
</tr>
<tr>
<td>Branch A to Branch C</td>
<td>80 m</td>
</tr>
<tr>
<td>Branch A to Branch D</td>
<td>65 m</td>
</tr>
<tr>
<td>Branch B to Branch C</td>
<td>30 m</td>
</tr>
<tr>
<td>Branch B to Branch D</td>
<td>35 m</td>
</tr>
<tr>
<td>Branch C to Branch D</td>
<td>15 m</td>
</tr>
<tr>
<td>Delhi Branch to Kanpur</td>
<td>300 km</td>
</tr>
</tbody>
</table>

Number of computers in each of the branches:

<table>
<thead>
<tr>
<th>Branch</th>
<th>Number of Computers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Branch A</td>
<td>15</td>
</tr>
<tr>
<td>Branch B</td>
<td>25</td>
</tr>
<tr>
<td>Branch C</td>
<td>40</td>
</tr>
<tr>
<td>Branch D</td>
<td>115</td>
</tr>
</tbody>
</table>

(i) Suggest the most suitable place to install the server for the Delhi branch with a suitable reason.

(ii) Suggest an ideal layout for connecting all these branches within Delhi.

(iii) Which device will you suggest, that should be placed in each of these branches to efficiently connect all the computers within these branches?

(iv) Delhi firm is planning to connect to its Marketing department in Kanpur which is approximately 300 km away. Which type of network out of LAN, WAN or MAN will be formed? Justify your answer.

(v) Suggest a protocol that shall be needed to provide help for transferring of files between Delhi and Kanpur branch.

---

2023 Compartment

<table>
<thead>
<tr>
<th>Q. No.</th>
<th>Question</th>
<th>Mark</th>
</tr>
</thead>
</table>
| 1      | Fill in the blank:
In _______ switching, before a communication starts, a dedicated path is identified between the sender and the receiver.
(a) Packet
(b) Graph
(c) Circuit
(d) Plot | 1     |
2. (a) Write any two differences between Fiber-optic cable and Coaxial cable.

OR

(b) Write one advantage and one disadvantage of wired over wireless communication.

3. (a) Write the full forms of the following:
   (i) XML
   (ii) HTTPS

(b) What is the use of FTP?

ABC Consultants are setting up a secure network for their office campus at Noida for their day-to-day office and web-based activities. They are planning to have connectivity between three buildings and the head office situated in Bengaluru. As a network consultant, give solutions to the questions (i) to (v), after going through the building locations and other details which are given below:

![Diagram showing Noida and Bengaluru branches with buildings](image)

Distance between various blocks/locations:

<table>
<thead>
<tr>
<th>Building</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building 1 to Building 3</td>
<td>120 m</td>
</tr>
<tr>
<td>Building 1 to Building 2</td>
<td>50 m</td>
</tr>
<tr>
<td>Building 2 to Building 3</td>
<td>65 m</td>
</tr>
<tr>
<td>Noida Branch to Head Office</td>
<td>1500 km</td>
</tr>
</tbody>
</table>

Number of computers:

<table>
<thead>
<tr>
<th>Building</th>
<th>Number of Computers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building 1</td>
<td>25</td>
</tr>
<tr>
<td>Building 2</td>
<td>51</td>
</tr>
<tr>
<td>Building 3</td>
<td>150</td>
</tr>
<tr>
<td>Head Office</td>
<td>10</td>
</tr>
</tbody>
</table>
(i) Suggest the most suitable place to install the server for this organization. Also, give reason to justify your suggested location.

(ii) Suggest the cable layout of connections between the buildings inside the campus.

(iii) Suggest the placement of the following devices with justification:
   - Switch
   - Repeater

(iv) The organization is planning to provide a high-speed link with the head office situated in Bengaluru, using a wired connection. Suggest a suitable wired medium for the same.

(v) The System Administrator does remote login to any PC, if any requirement arises. Name the protocol, which is used for the same.
2023

1. Fill in the blank:
   In a relational model, tables are called ________, that store data for different columns.
   (a) Attributes   (c) Relations
   (b) Degrees      (d) Tuples

2. Fill in the blank:
   ________ statement of SQL is used to insert new records in a table.
   (a) ALTER   (c) INSERT
   (b) UPDATE   (d) CREATE

3. Explain the usage of HAVING clause in GROUP BY command in RDBMS with the help of an example.

4. Differentiate between IN and BETWEEN operators in SQL with appropriate examples.

5. Which of the following is NOT a DML command?
   DELETE, DROP, INSERT, UPDATE

6. Consider the following tables Student and Sport:

   What will be the output of the following statement?
   SELECT * FROM Student, Sport;

7. Write the output of the queries (i) to (iv) based on the table, GARMENT given below:

   (i) SELECT DISTINCT(COUNT(FCODE)) FROM GARMENT;
   (ii) SELECT FCODE, COUNT(*), MIN(PRICE) FROM GARMENT GROUP BY FCODE HAVING COUNT(*)>1;
   (iii) SELECT TYPE FROM GARMENT WHERE ODR_DATE>'2021-02-01' AND PRICE <1500;
   (iv) SELECT * FROM GARMENT WHERE TYPE LIKE 'F%';

8. Write the output of any three SQL queries (i) to (iv) based on the tables COMPANY and CUSTOMER given below:

   (i) SELECT PRODUCTNAME, COUNT(*) FROM COMPANY GROUP BY PRODUCTNAME HAVING COUNT(*)>2;
   (ii) SELECT NAME, PRICE, PRODUCTNAME FROM COMPANY C, CUSTOMER CT WHERE C.CID = CU.CID AND C_NAME = 'SONY';
   (iii) SELECT DISTINCT CITY FROM COMPANY;
   (iv) SELECT * FROM COMPANY WHERE C_NAME LIKE '%ON%';
9. The ABC Company is considering to maintain their salespersons records using SQL to store data. As a database administrator, Alia created the table Salesperson and also entered the data of 5 Salespersons.

<table>
<thead>
<tr>
<th>S_ID</th>
<th>S_NAME</th>
<th>AGE</th>
<th>S_AMOUNT</th>
<th>REGION</th>
</tr>
</thead>
<tbody>
<tr>
<td>S001</td>
<td>SHYAM</td>
<td>35</td>
<td>20000</td>
<td>NORTH</td>
</tr>
<tr>
<td>S002</td>
<td>RISHABH</td>
<td>30</td>
<td>25000</td>
<td>EAST</td>
</tr>
<tr>
<td>S003</td>
<td>SUNIL</td>
<td>29</td>
<td>21000</td>
<td>NORTH</td>
</tr>
<tr>
<td>S004</td>
<td>RAHIL</td>
<td>39</td>
<td>22000</td>
<td>WEST</td>
</tr>
<tr>
<td>S005</td>
<td>AMIT</td>
<td>40</td>
<td>23000</td>
<td>EAST</td>
</tr>
</tbody>
</table>

Based on the data given above, answer the following questions:

(i) Identify the attribute that is best suited to be the Primary Key and why?
(ii) The Company has asked Alia to add another attribute in the table. What will be the new degree and cardinality of the above table?
(iii) Write the statements to:
   (a) Insert details of one salesman with appropriate data.
   (b) SHYAM SOUTH in the table Salesperson.
(iv) Write the statement to:
   (a) Delete the record of salesman RISHABH, as he has left the company.
   (b) Remove an attribute REGION from the table.

2023 Compartment

1. Fill in the blank.
   (a) Attribute     (b) Degree
   (c) Domain        (d) Cardinality

2. Fill in the blank:
   ______ clause is used with SELECT statement to display data in a sorted form with respect to a specified column.
   (a) WHERE          (b) ORDER BY
   (c) HAVING         (d) DISTINCT

3. Explain the concept of “Alternate Key” in a Relational Database Management System with an appropriate example.

4. Differentiate between CHAR and VARCHAR data types in SQL with appropriate example.

5. Name any two DDL and any two DML commands.

6. Write the output of the queries (i) to (iv) based on the table, WORKER given below:

<table>
<thead>
<tr>
<th>W_ID</th>
<th>F_NAME</th>
<th>L_NAME</th>
<th>CITY</th>
<th>STATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>102</td>
<td>SAHIL</td>
<td>KHAN</td>
<td>KANPUR</td>
<td>UTTAR PRADESH</td>
</tr>
<tr>
<td>104</td>
<td>SAMEER</td>
<td>PARIKH</td>
<td>ROOP NAGAR</td>
<td>PUNJAB</td>
</tr>
<tr>
<td>105</td>
<td>MARY</td>
<td>JONES</td>
<td>DELHI</td>
<td>DELHI</td>
</tr>
<tr>
<td>106</td>
<td>MAHIR</td>
<td>SHARMA</td>
<td>SONIPAT</td>
<td>HARYANA</td>
</tr>
<tr>
<td>107</td>
<td>ATHARVA</td>
<td>BHARDWAJ</td>
<td>DELHI</td>
<td>DELHI</td>
</tr>
<tr>
<td>108</td>
<td>VEDA</td>
<td>SHARMA</td>
<td>KANPUR</td>
<td>UTTAR PRADESH</td>
</tr>
</tbody>
</table>

(i) SELECT F_NAME, CITY FROM WORKER ORDER BY STATE DESC;
(ii) SELECT DISTINCT (CITY) FROM WORKER;
(iii) SELECT F_NAME, STATE FROM WORKER WHERE L_NAME LIKE '_HA';
(iv) SELECT CITY,COUNT(*) FROM WORKER GROUP BY CITY;
7. Write the outputs of the SQL queries (i) to (iv) based on the relations COMPUTER and SALES given below:

<table>
<thead>
<tr>
<th>Table: SALES</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROD_ID</td>
</tr>
<tr>
<td>P002</td>
</tr>
<tr>
<td>P003</td>
</tr>
<tr>
<td>P001</td>
</tr>
<tr>
<td>P004</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table: COMPUTER</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROD_ID</td>
</tr>
<tr>
<td>---------</td>
</tr>
<tr>
<td>P001</td>
</tr>
<tr>
<td>P002</td>
</tr>
<tr>
<td>P003</td>
</tr>
<tr>
<td>P004</td>
</tr>
<tr>
<td>P005</td>
</tr>
<tr>
<td>P006</td>
</tr>
</tbody>
</table>

(i) SELECT MIN(PRICE), MAX(PRICE) FROM COMPUTER;
(ii) SELECT COMPANY, COUNT(*) FROM COMPUTER GROUP BY COMPANY HAVING COUNT(COMPANY) > 1;
(iii) SELECT PROD_NAME, QTY_SOLD FROM COMPUTER C, SALES S WHERE C.PROD_ID=S.PROD_ID AND TYPE = 'INPUT';
(iv) SELECT PROD_NAME, COMPANY, QUARTER FROM COMPUTER C, SALES S WHERE C.PROD_ID=S.PROD_ID;

8. The school has asked their estate manager Mr. Rahul to maintain the data of all the labs in a table LAB. Rahul has created a table and entered data of 5 labs.

<table>
<thead>
<tr>
<th>LABNO</th>
<th>LAB_NAME</th>
<th>INCHARGE</th>
<th>CAPACITY</th>
<th>FLOOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>L001</td>
<td>CHEMISTRY</td>
<td>Daisy</td>
<td>20</td>
<td>I</td>
</tr>
<tr>
<td>L002</td>
<td>BIOLOGY</td>
<td>Venky</td>
<td>20</td>
<td>II</td>
</tr>
<tr>
<td>L003</td>
<td>MATH</td>
<td>Preeti</td>
<td>15</td>
<td>I</td>
</tr>
<tr>
<td>L004</td>
<td>LANGUAGE</td>
<td>Daisy</td>
<td>36</td>
<td>III</td>
</tr>
<tr>
<td>L005</td>
<td>COMPUTER</td>
<td>Mary Kom</td>
<td>37</td>
<td>II</td>
</tr>
</tbody>
</table>

Based on the data given above answer the following questions:
(i) Identify the columns which can be considered as Candidate keys.
(ii) Write the degree and cardinality of the table.
(iii) Write the statements to:
   (a) Insert a new row with appropriate data.
   (b) Increase the capacity of all the labs by 10 students which are on T Floor.

9. Write the statements to:
   (a) Add a constraint PRIMARY KEY to the column LABNO in the table.
   (b) Delete the table LAB.

2022

1. Differentiate between the terms Attribute and Domain in the context of Relational Data Model.

2. Write the output of SQL queries (a) to (d) based on the table VACCINATION_DATA given below:

<table>
<thead>
<tr>
<th>TABLE : VACCINATION_DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>VID</td>
</tr>
<tr>
<td>-----</td>
</tr>
<tr>
<td>101</td>
</tr>
<tr>
<td>102</td>
</tr>
<tr>
<td>103</td>
</tr>
<tr>
<td>104</td>
</tr>
<tr>
<td>105</td>
</tr>
</tbody>
</table>
3. Write the output of SQL queries (a) and (b) based on the following two tables DOCTOR and PATIENT belonging to the same database:

```
(a) SELECT Name, Age FROM VACCINATION_DATA
    WHERE Dose2 IS NOT NULL AND Age > 40;
(b) SELECT City, COUNT(*) FROM VACCINATION_DATA GROUP BY City;
(c) SELECT DISTINCT City FROM VACCINATION_DATA;
(d) SELECT MAX (Dose1), MIN (Dose2) FROM VACCINATION_DATA;
```

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PNO</td>
<td>PNAME</td>
<td>ADMDATE</td>
<td>DNO</td>
</tr>
<tr>
<td>P1</td>
<td>NOOR</td>
<td>2021-12-25</td>
<td>D1</td>
</tr>
<tr>
<td>P2</td>
<td>ANNIE</td>
<td>2021-11-20</td>
<td>D2</td>
</tr>
<tr>
<td>P3</td>
<td>PRAKASH</td>
<td>2020-12-10</td>
<td>NULL</td>
</tr>
<tr>
<td>P4</td>
<td>HAREMINT</td>
<td>2019-12-20</td>
<td>D1</td>
</tr>
</tbody>
</table>

```
Table : DOCTOR

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DNO</td>
<td>DNAME</td>
<td>FEES</td>
</tr>
<tr>
<td>D1</td>
<td>AMITABH</td>
<td>1500</td>
</tr>
<tr>
<td>D2</td>
<td>ANIKET</td>
<td>1000</td>
</tr>
<tr>
<td>D3</td>
<td>NIKHIL</td>
<td>1500</td>
</tr>
<tr>
<td>D4</td>
<td>ANJANA</td>
<td>1500</td>
</tr>
</tbody>
</table>
```

(a) SELECT DNAME, PNAME FROM DOCTOR
    NATURAL JOIN PATIENT;

(b) SELECT PNAME, ADMDATE, FEES
    FROM PATIENT P, DOCTOR D
    WHERE D.DNO = P.DNO AND FEES > 1000;

4. Differentiate between Candidate Key and Primary Key in the context of Relational Database Model.

5. Consider the following table PLAYER:

```
(a) Identify and write the name of the most appropriate column from the given table PLAYER that can be used as a Primary key.

(b) Define the term Degree in relational data model. What is the Degree of the given table PLAYER?
1. Write the output of the SQL queries (a) to (d) based on the table TRAVEL given below:

<table>
<thead>
<tr>
<th>T_ID</th>
<th>START</th>
<th>END</th>
<th>T_DATE</th>
<th>FARE</th>
</tr>
</thead>
<tbody>
<tr>
<td>101</td>
<td>DELHI</td>
<td>CHENNAI</td>
<td>2021-12-25</td>
<td>4500</td>
</tr>
<tr>
<td>102</td>
<td>DELHI</td>
<td>BENGALURU</td>
<td>2021-11-20</td>
<td>4000</td>
</tr>
<tr>
<td>103</td>
<td>MUMBAI</td>
<td>CHENNAI</td>
<td>2020-12-10</td>
<td>5500</td>
</tr>
<tr>
<td>104</td>
<td>DELHI</td>
<td>MUMBAI</td>
<td>2019-12-20</td>
<td>4500</td>
</tr>
<tr>
<td>105</td>
<td>MUMBAI</td>
<td>BENGALURU</td>
<td>2022-01-15</td>
<td>5000</td>
</tr>
</tbody>
</table>

(a) `SELECT START, END FROM TRAVEL WHERE FARE <= 4000 ;`
(b) `SELECT T_ID, FARE FROM TRAVEL WHERE T_DATE LIKE '2021-12-%' ;`
(c) `SELECT T_ID, T_DATE FROM TRAVEL WHERE END = 'CHENNAI' ORDER BY FARE ;`
(d) `SELECT START, MIN(FARE) FROM TRAVEL GROUP BY START ;`

2. Write the output of the SQL queries (a) and (b) based on the following two tables FLIGHT and PASSENGER belonging to the same database:

<table>
<thead>
<tr>
<th>FNO</th>
<th>DEPART</th>
<th>ARRIVE</th>
<th>FARE</th>
</tr>
</thead>
<tbody>
<tr>
<td>F101</td>
<td>DELHI</td>
<td>CHENNAI</td>
<td>4500</td>
</tr>
<tr>
<td>F102</td>
<td>DELHI</td>
<td>BENGALURU</td>
<td>4000</td>
</tr>
<tr>
<td>F103</td>
<td>MUMBAI</td>
<td>CHENNAI</td>
<td>5500</td>
</tr>
<tr>
<td>F104</td>
<td>DELHI</td>
<td>MUMBAI</td>
<td>4500</td>
</tr>
<tr>
<td>F105</td>
<td>MUMBAI</td>
<td>BENGALURU</td>
<td>5000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FNO</th>
<th>NAME</th>
<th>FLIGHTDATE</th>
<th>FNO</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>PRAKASH</td>
<td>2021-12-25</td>
<td>F101</td>
</tr>
<tr>
<td>P2</td>
<td>NOOR</td>
<td>2021-11-20</td>
<td>F103</td>
</tr>
<tr>
<td>P3</td>
<td>HARMEEP</td>
<td>2020-12-10</td>
<td>NULL</td>
</tr>
<tr>
<td>P4</td>
<td>ANNIE</td>
<td>2019-12-20</td>
<td>F105</td>
</tr>
</tbody>
</table>

(a) `SELECT NAME, DEPART FROM FLIGHT NATURAL JOIN PASSENGER ;`
(b) `SELECT NAME, FARE FROM PASSENGER P, FLIGHT F WHERE F.FNO = P.FNO AND F.DEPART = 'MUMBAI' ;`

3. Explain Primary Key in the context of Relational Database Model. Support your answer with suitable example.

4. Consider the following table BATSMEN:

<table>
<thead>
<tr>
<th>FNO</th>
<th>NAME</th>
<th>SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>RISHABH</td>
<td>52</td>
</tr>
<tr>
<td>P2</td>
<td>HUSSAIN</td>
<td>45</td>
</tr>
<tr>
<td>P3</td>
<td>ARNOLD</td>
<td>23</td>
</tr>
<tr>
<td>P4</td>
<td>ARNAV</td>
<td>18</td>
</tr>
<tr>
<td>P5</td>
<td>GURSHARAN</td>
<td>52</td>
</tr>
</tbody>
</table>
5. Identify and write the name of the Candidate Keys in the given table BATSMEN.

(ii) How many tuples are there in the given table BATSMEN?

(a) A SQL table BOOKS contains the following column names: BOOKNO, BOOKNAME, QUANTITY, PRICE, AUTHOR. Write the SQL statement to add a new column REVIEW to store the reviews of the book.

(b) Write the names of any two commands of DDL and any two commands of DML in SQL.

6. Rashmi has forgotten the names of the databases, tables and the structure of the tables that she had created in Relational Database Management System (RDBMS) on her computer.

(a) Write the SQL statement to display the names of all the databases present in RDBMS application on her computer.

(b) Write the statement which she should execute to open the database named "STOCK".

(c) Write the statement which she should execute to display the structure of the table "ITEMS" existing in the above opened database "STOCK".

7. Write SQL queries for (a) to (d) based on the tables CUSTOMER and TRANSACT given below:

<table>
<thead>
<tr>
<th>Table : CUSTOMER</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNO</td>
</tr>
<tr>
<td>-----</td>
</tr>
<tr>
<td>1001</td>
</tr>
<tr>
<td>1002</td>
</tr>
<tr>
<td>1003</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table : TRANSACT</th>
</tr>
</thead>
<tbody>
<tr>
<td>TNO</td>
</tr>
<tr>
<td>-----</td>
</tr>
<tr>
<td>T1</td>
</tr>
<tr>
<td>T2</td>
</tr>
<tr>
<td>T3</td>
</tr>
<tr>
<td>T4</td>
</tr>
</tbody>
</table>

(a) Write the SQL statements to delete the records from table TRANSACT whose amount is less than 1000.

(b) Write a query to display the total AMOUNT of all DEBITS and all CREDITS.

(c) Write a query to display the NAME and corresponding AMOUNT of all CUSTOMERS who made a transaction type (TTYPE) of CREDIT.

(d) Write the SQL statement to change the Phone number of customer whose CNO is 1002 to 9988117700 in the table CUSTOMER.
The code given below deletes the record from the table employee which contains the following record structure:

- E_code  - String
- E_name  - String
- Sal     - Integer
- City    - String

Note the following to establish connectivity between Python and MySQL:
- Username is root
- Password is root
- The table exists in a MySQL database named `emp`.
- The details (E_code, E_name, Sal, City) are the attributes of the table.

Write the following statements to complete the code:

Statement 1 – to import the desired library.

Statement 2 – to execute the command that deletes the record with E_code as ‘E101’.

Statement 3 – to delete the record permanently from the database.

```python
import __________ as mysql       # Statement 1

def delete( ) :
    mydb=mysql.connect(host="localhost",user="root",passwd="root",database="emp")

    mycursor=mydb.cursor( )

    ________________  # Statement 2
    ________________  # Statement 3

    print ("Record deleted")
```
2. Predict the output of the code given below:

```python
def makenew(mystr):
    newstr=""
    count=0
    for i in mystr:
        if count%2!=0:
            newstr=newstr+str(count)
        else:
            if i.lower():
                newstr=newstr+i.upper()
            else:
                newstr=newstr+i
        count+=1
    print(newstr)
makenew("No@1")
```

3. The code given below reads the following records from the table employee and displays only those records who have employees coming from city 'Delhi':

- E_code - String
- E_name - String
- Sal - Integer
- City - String

Note the following to establish connectivity between Python and MySQL:
- Username is root
- Password is root
- The table exists in a MySQL database named emp.
- The details (E_code, E_name, Sal, City) are the attributes of the table.
Write the following statements to complete the code:

Statement 1 – to import the desired library.

Statement 2 – to execute the query that fetches records of the employees coming from city ‘Delhi’.

Statement 3 – to read the complete data of the query (rows whose city is Delhi) into the object named details, from the table employee in the database.

```python
import ______________ as mysql  # Statement 1

def display():
    mydb=mysql.connect(host="localhost",user="root",
                        passwd="root",database="emp")
    mycursor=mydb.cursor()

    ____________________________  # Statement 2
    details = ____________________________  # Statement 3
    for i in details:
        print (i)
```

4. `fetchone()` method fetches only one row in a ResultSet and returns a ________.
   (a) Tuple  
   (b) List  
   (c) Dictionary  
   (d) String
5. The table **Bookshop** in MySQL contains the following attributes:
   - B_code – Integer
   - B_name – String
   - Qty – Integer
   - Price – Integer

   Note the following to establish connectivity between Python and MySQL on a ‘localhost’:
   - Username is ‘shop’
   - Password is ‘Book’
   - The table exists in a MySQL database named **Bstore**.

   The code given below updates the records from the table **Bookshop** in MySQL.

   Statement 1 – to form the cursor object.

   Statement 2 – to execute the query that updates the Qty to 20 of the records whose B_code is 105 in the table.

   Statement 3 – to make the changes permanent in the database.

   ```python
   import mysql.connector as mysql
   def update_book():
       mydb=mysql.connect(host="localhost",
                       user="shop",passwd="Book",database="Bstore")
       mycursor=___________       # Statement 1
       qry = "update Bookshop set Qty=20 where B_code=105"
       _____________           # Statement 2
       _____________           # Statement 3
   ```
6. The table **Bookshop** in MySQL contains the following attributes:
   - **B_code** – Integer
   - **B_name** – String
   - **Qty** – Integer
   - **Price** – Integer

Note the following to establish connectivity between Python and MySQL on a ‘localhost’:
- Username is ‘shop’
- Password is ‘Book’
- The table exists in a MySQL database named **Bstore**.

The code given below reads the records from the table **Bookshop** and displays all the records:

Statement 1 – to form the cursor object.
Statement 2 – to write the query to display all the records from the table.
Statement 3 – to read the complete result of the query into the object named **B_Details**, from the table **Bookshop** in the database.

```python
import mysql.connector as mysql

def Display_book():
    mydb=mysql.connect(host="localhost",
                       user="shop",passwd="Book",database="Bstore")
    mycursor=__________        # Statement 1
    mycursor.execute("________") # Statement 2
    B_Details=__________        # Statement 3
    for i in B_Details:
        print(i)
```