Marking Scheme

Strictly Confidential

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Senior Secondary School Examination 2025

SUBJECT NAME: COMPUTER SCIENCE SUBJECT CODE: 083 (Set 4 Q.P. CODE 91)

General Instructions:		
1	You are aware that evaluation is the most important process in the actual and correct assessment of the candidates. A small mistake in evaluation may lead to serious problems which may affect the future of the candidates, education system and teaching profession. To avoid mistakes, it is requested that before starting evaluation, you must read and understand the spot evaluation guidelines carefully.	
2	“Evaluation policy is a confidential policy as it is related to the confidentiality of the examinations conducted, Evaluation done and several other aspects. Its’ leakage to the public in any manner could lead to derailment of the examination system and affect the life and future of millions of candidates. Sharing this policy/document to anyone, publishing in any magazine and printing in News Paper/Website etc. may invite action under various rules of the Board and IPC.”	
3	Evaluation is to be done as per instructions provided in the Marking Scheme. It should not be done according to one’s own interpretation or any other consideration. Marking Scheme should be strictly adhered to and religiously followed. However, while evaluating answers which are based on latest information or knowledge and/or are innovative, they may be assessed for their correctness otherwise and due marks be awarded to them. In class-X, while evaluating two competency-based questions, please try to understand the given answer and even if the reply is not from the marking scheme but correct competency is enumerated by the candidate, due marks should be awarded.	
4	The Marking Scheme carries only suggested value points for the answers. These are in the nature of Guidelines only and do not constitute the complete answer. The students can have their own expression and if the expression is correct, the due marks should be awarded accordingly.	
5	The Head-Examiner must go through the first five answer books evaluated by each evaluator on the first day, to ensure that evaluation has been carried out as per the instructions given in the Marking Scheme. If there is any variation, the same should be zero after deliberation and discussion. The remaining answer books meant for evaluation shall be given only after ensuring that there is no significant variation in the marking of individual evaluators.	
6	Evaluators will mark(ʃ) wherever the answer is correct. For wrong answer CROSS ‘X” be marked. Evaluators will not put right (✓)while evaluating which gives an impression that the answer is correct and no marks are awarded. This is the most common mistake which evaluators are committing.	
7	If a question has parts, please award marks on the right-hand side for each part. Marks awarded for different parts of the question should then be totaled up and written in the left-hand margin and encircled. This may be followed strictly.	
8	If a question does not have any parts, marks must be awarded in the left-hand margin and encircled. This may also be followed strictly.	
9	If a student has attempted an extra question, the answer of the question deserving more marks should be retained and the other answer scored out with a note “Extra Question”.	

10	No marks to be deducted for the cumulative effect of an error. It should be penalized only once.	
11	A full scale of marks **70 marks** has to be used. Please do not hesitate to award full marks if the answer deserves it.	
12	Every examiner has to necessarily do evaluation work for full working hours i.e., 8 hours every day and evaluate 20 answer books per day in main subjects and 25 answer books per day in other subjects (Details are given in Spot Guidelines).This is in view of the reduced syllabus and number of questions in question paper.	
13	Ensure that you do not make the following common types of errors committed by the Examiner in the past:- • Leaving the answer or part thereof unassessed in an answer book. • Giving more marks for an answer than assigned to it. • Wrong totaling of marks awarded on an answer. • Wrong transfer of marks from the inside pages of the answer book to the title page. • Wrong question wise totaling on the title page. • Wrong totaling of marks of the two columns on the title page. • Wrong grand total. • Marks in words and figures not tallying/not same. • Wrong transfer of marks from the answer book to online award list. • Answers marked as correct, but marks not awarded. (Ensure that the right tick mark is correctly and clearly indicated. It should merely be a line. Same is with the X for incorrect answers.) • Half or a part of the answer marked correct and the rest as wrong, but no marks awarded.	
14	While evaluating the answer books, if the answer is found to be totally incorrect, it should be marked as cross (X) and awarded zero (0)Marks.	
15	Any unassessed portion, non-carrying over of marks to the title page, or totaling error detected by the candidate shall damage the prestige of all the personnel engaged in the evaluation work as also of the Board. Hence, in order to uphold the prestige of all concerned, it is again reiterated that the instructions be followed meticulously and judiciously.	
16	The Examiners should acquaint themselves with the guidelines given in the "Guidelines for Spot Evaluation" before starting the actual evaluation.	
17	Every Examiner shall also ensure that all the answers are evaluated, marks carried over to the title page, correctly totaled and written in figures and words.	
18	The candidates are entitled to obtain a photocopy of the Answer Book on request on payment of the prescribed processing fee. All Examiners/Additional Head Examiners/Head Examiners are once again reminded that they must ensure that evaluation is carried out strictly as per value points for each answer as given in the Marking Scheme.	

MARKING SCHEME
COMPUTER SCIENCE 083

Max. Marks: 70

General Instructions :

(i) *This question paper contains 37 questions.*

(ii) ***All** questions are **compulsory**. However, internal choices have been provided in some questions. Attempt only one of the choices in such questions.*

(iii) *The paper is divided into 5 Sections - **A, B, C, D, E.***

(iv) ***Section A,** consists of **21** questions (1 to 21). Each question carries **1** mark.*

(v) ***Section B,** consists of **7** questions (22 to 28). Each question carries **2** marks.*

(vi) ***Section C,** consists of **3** questions (29 to 31). Each question carries 3 marks.*

(vii) ***Section D,** consists of **4** questions (32 to 35). Each question carries 4 marks.*

(viii) ***Section E,** consists of **2** questions (36 & 37). Each question carries 5 marks.*

(ix) *All programming questions are to be answered using Python Language only.*

(x) *In case of MCQs, text of the correct answer should also be written*

Specific Instructions:

- The answers given in the marking scheme are SUGGESTIVE. Examiners are requested to award marks for all alternative correct Solutions/Answers conveying a similar meaning
- All programming questions have to be answered with respect to Python only
- In Python, ignore case sensitivity for identifiers (Variable / Functions / Structures / Class Names)
- In Python indentation is mandatory, however, the number of spaces used for indenting may vary
- In SQL related questions - both ways of text/character entries should be acceptable for Example: “AMAR” and ‘amar’ both are acceptable.
- In SQL related questions - all date entries should be acceptable for Example: ‘YYYY-MM-DD’, ‘YY-MM-DD’, ‘DD-Mon-YY’, “DD/MM/YY”, ‘DD/MM/YY’, “MM/DD/YY”, ‘MM/DD/YY’ and {MM/DD/YY} are correct.
- In SQL related questions - semicolon should be ignored for terminating the SQL statements
- In SQL related questions - ignore case sensitivity
- In SQL output questions - ignore the column headers
- In SQL output questions - ignore the order of rows until `ORDER BY` is specified

	SECTION A	**(21x1=21)**
1.	State True or False: “A Python List must always contain all its elements of same data type.”	1
Ans	False	
	(1 Mark for writing the correct answer)	

2.	What will be the output of the following statement? `print(14%3**2*4)` (A) 16 (B) 64 (C) 20 (D) 256	1
Ans	(C) 20	
	(1 Mark for writing the correct option)	

3.	Identify the correct output of the following code snippet:
	`game="Olympic2024"`
	`print(game.index("C"))`
	(A) 0 (B) 6
	(C) -1 (D) `ValueError`
		1

Ans	(D) `ValueError`	
	(1 Mark for writing the correct option)	
4.	Which of the following is the correct identifier? (A) `global` (B) `Break` (C) `def` (D) `with`	1
Ans	**(B)** `Break`	
	(1 Mark for writing the correct option)	
5.	Identify the invalid Python statement out of the following options: (A) `print("A",10,end="*")` (B) `print("A",sep="*",10)` (C) `print("A",10,sep="*")` (D) `print("A"*10)`	1
Ans	**(B)** `print("A",sep="*",10)`	
	(1 Mark for writing the correct option)	

6.	Consider the statements given below and then choose the correct output from the given options:
	`L=['TIC', 'TAC']`
	`print(L[::-1])`
	(A) `['CIT', 'CAT']` (B) `['TIC', 'TAC']`
	(C) `['CAT', 'CIT']` (D) `['TAC', 'TIC']`
		1

Ans	**(D)** `['TAC', 'TIC']`	
	(1 Mark for writing the correct option)	
7.	Which of the following operator evaluates to `True` if the variable on either side of the operator points towards the same memory location and `False` otherwise? (A) `is` (B) `is not` (C) `and` (D) `or`	1

Ans	(A) `is`	
	(1 Mark for writing the correct option)	

8.	Consider the statements given below and then choose the correct output from the given options:
	`D={'S01':95, 'S02':96 }`
	`for I in D:`
	`  print(I,end='#')`
	(A) `S01#S02#` (B) `95#96#`
	(C) `S01,95#S02,96#` (D) `S01#95#S02#96#`
		1

Ans	(A) `S01#S02#`	
	(1 Mark for writing the correct option)	
9.	While creating a table, which constraint does not allow insertion of duplicate values in the table ? (A) `UNIQUE` (B) `DISTINCT` (C) `NOT NULL` (D) `HAVING`	1
Ans	**(A)**`UNIQUE`	
	(1 Mark for writing the correct option)	

10.	Consider the statements given below and then choose the correct output from the given options:
	`def Change(N):`
	`   N=N+10`
	`   print(N,end='$$')`
	`N=15`
	`Change(N)`
	`print(N)`
	(A) `25$$15` (B) `15$$25`
	(C) `25$$25` (D) `2525$$`
		1

Ans	(A) `25$$15`	
	(1 Mark for writing the correct option)	

11. Consider the statements given below and then choose the correct output from the given options: 1

```
N='5'
try:
   print('WORD' + N, end='#')
except:
   print('ERROR',end='#')
finally:
   print('OVER')
```

(A) `ERROR#` (B) `WORD5#OVER`

(C) `WORD5#` (D) `ERROR#OVER`

Ans (B) `WORD5#OVER`

(1 Mark for writing the correct option)

12. Which of the following built-in function/method returns a dictionary ? 1

(A) `dict()` (B) `keys()`

(C) `values()` (D) `items()`

Ans (A) `dict()`

(1 Mark for writing the correct option)

13. Which of the following is a DML command in SQL ? 1

(A) `UPDATE` (B) `CREATE`

(C) `ALTER` (D) `DROP`

Ans (A) `UPDATE`

(1 Mark for writing the correct option)

14. Which aggregate function in SQL displays the number of values in the specified column ignoring the NULL values ? 1

(A) `len()` (B) `count()`

(C) `number()` (D) `num()`

Ans (B) `count()`

(1 Mark for writing the correct option)

15. In MYSQL, which type of value should not be enclosed within quotation marks ? 1

(A) `DATE` (B) `VARCHAR`

(C) `FLOAT` (D) `CHAR`

Ans (C) `FLOAT`

(1 Mark for writing the correct option)

16.	State True or False : If table **A** has **6** rows and **3** columns, and table **B** has **5** rows and **2** columns, the Cartesian product of **A** and **B** will have 30 rows and 5 columns.	1
Ans	`True`	
	(1 Mark for writing the correct answer)	
17.	Which of the following networking devices is used to regenerate and transmit the weakened signal ahead? (A) `Hub` (B) `Ethernet Card` (C) `Repeater` (D) `Modem`	1
Ans	(C) `Repeater`	
	(1 Mark for writing the correct option)	
18.	Which of the following options is the correct protocol used for phone calls over the Internet? (A) `PPP` (B) `FTP` (C) `HTTP` (D) `VoIP`	1
Ans	(D) `VoIP`	
	(1 Mark for writing the correct option)	
19.	Expand ARPANET.	1
Ans	Advanced Research Projects Agency Network	
	(Full 1 Mark for writing the the correct full form) **OR** ***(½ Mark for writing any two correct expanded terms)***	
	Q.Nos. **20** and **21** are Assertion (A) and Reason (R) based questions. Mark the correct choice as (A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation for Assertion (A). (B) Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation for Assertion (A). (C) Assertion (A) is true but, Reason (R) is false. (D) Assertion (A) is false but, Reason (R) is true.	
20.	**Assertion (A):** For a binary file opened using `'rb'` mode, the `pickle.dump()` method will display an error. **Reason (R):** The `pickle.dump()` method is used to read from a binary file.	1
Ans	(C) Assertion (A) is true, but Reason (R) is false.	
	(1 Mark for writing the correct option)	
21.	**Assertion (A) :** We can retrieve records from more than one table in MYSQL. **Reason (R) :** Foreign key is used to establish a relationship between two tables.	1

Ans (B) Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation for Assertion (A).

(1 Mark for writing the correct option)

SECTION B **(7x2=14)**

22. What does the `return` statement do in a function ? Explain with the help of an example. 2

Ans The return statement in Python is used to exit a function and return a value to the caller.
Example :

```
 def Add(A, B):
    return A+B
 Result=Add(5,3)
 print(Result)

Output:
8
```

(1 Mark for writing the correct explanation)
(1 Mark for writing the correct example)
OR
(Full 2 Marks for correct explanation with the help of a suitable example)

23. Write one example of each of the following in Python : 2
(i) Syntax Error
(ii) Implicit Type conversion

Ans **(i) Syntax Error**

```
print(2 ; 5)
```

(ii) Implicit Type conversion

```
x=10
y=20.5
print(x+y)
```

Note:

- The above examples are just suggestive. Accept all correct examples

(1 Mark for writing each correct example)

24. Consider the following dictionaries, D and D1 : 2

```
D={"Suman": 40, "Raj":55, "Raman":60}
D1={"Aditi":30, "Amit":90,"Raj":20}
```

(Answer using built-in Python functions only)

(i) (a) Write a statement to display/return the value corresponding to the key `"Raj"` in the dictionary `D`.

OR

(b) Write a statement to display the length of the dictionary `D1`.

(ii) (a) Write a statement to append all the key-value pairs of the dictionary `D` to the dictionary `D1`.

OR

(b) Write a statement to delete the item with the given key "Amit" from the dictionary D1.

Ans

(i) (a)
```
D.get("Raj") # OR D["Raj"] may also be considered
```
OR

(b)
```
len(D1)          # OR len(D1.items())
                 # OR len(D1.keys())
                 # OR len(D1.values())
```

(ii) (a)
```
D1.update(D)
```
OR

(b)
```
D1.pop("Amit") # OR del D1["Amit"]
               # may also be considered
```

(i) (1 Mark for writing the correct statement)
(ii) (1 Mark for writing the correct statement)

25. What possible output from the given options is expected to be displayed when the following code is executed? 2

```
import random
Cards=["Heart","Spade","Club","Diamond"]
for i in range(2):
  print(Cards[random.randint(1,i+2)],end="#")
```

(A) Spade#Diamond# (B) Spade#Heart#
(C) Diamond#Club# (D) Heart#Spade#

Ans (A) Spade#Diamond#

(2 Marks for writing the correct option)

26. The code given below accepts N as an integer argument and returns the sum of all integers from 1 to N. Observe the following code carefully and rewrite it after removing all syntax and logical errors. Underline all the corrections made. 2

```
def Sum(N)
   for I in range(N):
       S=S+I
   return S
print(Sum(10)
```

Ans
```
def Sum(N):
   S=N
   for I in range(N):
       S=S+I
   return S
print(Sum(10))
```
OR

```
def Sum(N):
   S=0
   for I in range(1,N+1): # OR  for I in range(N+1):
       S=S+I
   return S
print(Sum(10))
```

(Full 2 Marks for writing all required corrections)

OR

(½ Mark for writing the : after `def Sum(N)` ***)***

(½ Mark for correctly initialising `S`***)***

(½ Mark for calculating the correct/required sum `S`***)***

(½ Mark for writing the ' `)` ***' at the end of*** `print(Sum(10) )`

OR

(1 Mark for only identification of all/any three errors without correction)

27. Nisha is assigned the task of maintaining the staff data of an organization. She has to store the details of the staff in the SQL table named **`EMPLOYEES`** with attributes as **`EMPNO, NAME, DEPARTMENT, BASICSAL`** to store Employee's Identification Number, Name, Department and Basic Salary respectively. There can be two or more Employees with the same name in the organization. — 2

(i)

(a) Help Nisha to identify the attribute which should be designated as the **PRIMARY KEY.** Justify your anwer.

OR

(b) Help Nisha to identify the constraint which should be applied to the attribute **`NAME`** such that the Employees' Names cannot be left empty or **NULL** while entering the records but can have duplicate values.

Ans (i)

(a) `EMPNO`

(i) Employee's Identification Number always contains unique and not null values.

(ii) Other attributes may have duplicate values (assuming 2 or more employees may have same Name, Department or Basic Salary) and an attribute with possible duplicate values can not be considered as the Primary Key.

(Any one valid justification)

OR

(b) `NOT NULL`

(i) (a)

(½ Mark for suggesting the correct attribute for PRIMARY KEY)

(½ Mark for any one valid justification)

	OR *(i) (b)* *(1 Mark for writing the correct constraint for attribute NAME)*	
	(ii) (a) Write the **SQL** command to change the size of the attribute `BASICSAL` in the table `EMPLOYEES` to allow the maximum value of `99999.99` to be stored in it. OR (b) Write the SQL command to delete the table `EMPLOYEES`	

Ans	(ii)
	(a) `ALTER TABLE EMPLOYEES`
	`MODIFY COLUMN BASICSAL FLOAT(7,2);`
	`# OR DECIMAL(7,2)`
	OR
	(b) `DROP TABLE EMPLOYEES;`	

	(a) ***(½ Mark for writing*** `ALTER TABLE EMPLOYEES`***)*** ***(½ Mark for correctly writing remaining part of the command)*** ***OR*** **(b)** ***(1 Mark for writing*** `DROP TABLE EMPLOYEES` **correctly*)*** ***OR*** ***(½ Mark for writing*** `DROP TABLE` ***only)***	
28.	**(a)** Expand and explain the term **URL.** OR **(b)** Expand the term PPP. What is the use of **PPP**?	2
Ans	**(a)** URL (Uniform Resource Locator) : It is the unique address of any resource on the Internet. OR **(b)** PPP (Point to Point Protocol) : This protocol is used to establish a dedicated and direct connection between two communicating devices.	
	(a) ***(1 Mark for writing correct explanation)*** ***(1 Mark for writing correct expansion)*** ***OR*** ***(½ Mark for writing any two words of correct expansion)*** OR **(b)** ***(1 Mark for writing correct expansion)*** ***(1 Mark for writing correct use)*** ***OR*** ***(½ Mark for writing any two words of correct expansion)***	

SECTION C (3x3=9)

29. (a) Write a Python function that displays all the lines containing the word `'vote'` from a text file `"Elections.txt"`. For example, if the file contains : 3

In an election many people vote to choose their representative.

The candidate getting the maximum share of votes stands elected.

Normally, one person has to vote once.

The process of voting may vary with time and region.

Then the output should be :

In an election many people vote to choose their representative.

Normally, one person has to vote once.

Ans

```
def PrintVote():
  F=open("Elections.txt")
  Lines=F.readlines()
  for Line in Lines:
    L=Line.split()
    if "vote" in L:
      print(Line)
  F.close()
```

OR

```
def PrintVote():
  with open("Elections.txt") as F:
    Lines=F.readlines()
    for Line in Lines:
      L=Line.split()
      if "vote" in L:
         print(Line)
```

OR

```
def PrintVote():
  F=open("Elections.txt")
  while True:
    Line=F.readline()
    if Line!="":
        if "vote" in Line.split():
          print(Line)
    else:
       break
  F.close()
```

OR

Any other equivalent correct code

(½ Mark for opening the file in default/correct mode)
(½ Mark for correct reading & iteration)
(½ Mark for correct logic of extracting the word 'vote')
(1 Mark for correct condition)
(½ Mark for displaying line)

OR

(b) Write a Python function that displays all the words starting and ending with a vowel from a text file **"Report.txt"**. The consecutive words should be separated by a space in the output. For example, if the file contains :

```
Once there was a wise man in a village.
He was an awesome story-teller.
He was able to keep people anchored while listening to him.
```

Then the output should be :

```
Once a a awesome able
```

Ans

```
def vowels():
  F=open('Report.txt')
  Data=F.read()
  Words=Data.split()
  for Word in Words:
     if Word[0] in 'aeiouAEIOU':
        if Word[-1] in 'aeiouAEIOU':
            print(Word,end=' ')
  F.close()
```

OR

```
def vowels():
  with open('Report.txt') as F:
    Data=F.read()
    Words=Data.split()
    for Word in Words:
      if Word[0].upper() in 'AEIOU'
         and Word[-1].upper() in 'AEIOU':
           print(Word,end=' ')
```

OR

Any other equivalent correct code

(½ Mark for opening the file in default/correct mode)
(½ Mark for correct reading & iteration)
(½ Mark for correct logic to process each word)
(1 Mark for correct condition)
(½ Mark for displaying word)

30. (a) A stack, named `ClrStack`, contains records of some colors. Each record is represented as a tuple containing four elements - `ColorName, RED, GREEN, BLUE`. `ColorName` is a string, and `RED, GREEN, BLUE` are integers. For example, a record in the stack may be `('Yellow', 237, 250, 68)` — 3x1 =3

Write the following user-defined functions in Python to perform the specified operations on `ClrStack`:

(i)	`push_Clr(ClrStack, new_Clr)` : This function takes the stack ClrStack and a new record `new_Clr` as arguments and pushes this new record onto the stack.

(ii) pop_Clr(ClrStack): This function pops the topmost record from the stack and returns it. If the stack is already empty, the function should display the message "Underflow".

(iii) isEmpty(ClrStack): This function checks whether the stack is empty. If the stack is empty, the function should return **True**, otherwise the function should return False.

Ans

(i)

```
def push_Clr(ClrStack, new_Clr):
  ClrStack.append(new_Clr)
```

(ii)

```
def pop_Clr(ClrStack):
  if len(ClrStack) == 0:
  # OR if not ClrStack:
  # OR if ClrStack == []:
    print("Underflow")
  else:

    return(ClrStack.pop())
```

(iii)

```
def isEmpty(ClrStack):
  if len(ClrStack) == 0:
  # OR if not ClrStack:
  # OR if ClrStack == []:
    return True
  else:
    return False
```

(i)
(1 Mark for correct definition of push_Clr(ClrStack, new_Clr)***)***

(ii)
(½ Mark for correctly checking and displaying "Underflow")
(½ Mark for correctly popping and returning popped tuple/data)

(iii)
(½ Mark for correctly checking whether the Stack is Empty or not)
(½ Mark for correctly returning/printing the required values)

OR

(b) Write the following user-defined functions in Python :

(i) push_trail(N,myStack): Here N and myStack are lists, and myStack represents a stack. The function should push the last 5 elements from the list **N** onto the stack myStack. For example, if the list **N** is [1,2,3,4,5,6,7], then the function push_trail() should push the elements 3,4,5,6,7 onto the stack. Therefore the value of stack will be [3,4,5,6,7].

Assume that **N** contains at least 5 elements.

(ii) `pop_one(myStack)`: The function should pop an element from the stack `myStack`, and return this element. If the stack is empty, then the function should display the message `'Stack Underflow'`, and return `None`.

(iii) `display_all(myStack)`: The function should display all the elements of the stack `myStack`, without deleting them. If the stack is empty, the function should display the message `'Empty Stack'`.

Ans (b)

(i)

```
def push_trail(N,myStack):
  for i in range(-5,0,1): # Any other correct loop
    myStack.append(N[i])
```

(ii)

```
def pop_one(myStack):
  if not myStack:  #OR if myStack==[]:
                   #OR if len(myStack)==0:
    print('Stack Underflow')
  else:
    return myStack.pop()
```

(iii)

```
def display_all(myStack):
  if not myStack:  #OR if myStack==[]:
                   #OR if len(myStack)==0:
    print("Empty Stack")
  else:
    for i in myStack[::-1]: # print(myStack[::-1])
      print(i,end=' ')      # -
```

(i)

(1 Mark for correct definition of `push_trail(N,myStack)`*)*

(ii)

(½ Mark for correctly checking and displaying "Stack Underflow")

(½ Mark for correctly popping and returning last element)

(iii)

(½ Mark correctly checking Empty condition)

(½ Mark correctly displaying content till the last value in the stack)

31. (a) Predict the output of the following code : 3

```
def ExamOn(mystr) :
  newstr = ""
  count = 0
  for i in mystr:
    if count%2 != 0:
      newstr = newstr + str(count-1)
    else:
      newstr = newstr + i.lower()
    count += 1
  newstr = newstr + mystr[:2]
  print("The new string is:", newstr)
ExamOn("GenX")
```

Ans

```
The new string is: g0n2Ge
```

(½ Mark for each correct letter/digit in the right order)

Note:

(2½ Marks only to be awarded, if all the parts of `g0n2Ge is` ***written correctly without the text '***`The new string is:`***')***

OR

(b) Write the output on execution of the following Python code:

```
def Change(X):
  for K,V in X.items():
  L1.append(K)
  L2.append(V)
D={1:"ONE",2:"TWO",3:"THREE"}
L1=[]
L2=[]
Change(D)
print(L1)
print(L2)
print(D)
```

Ans

Note: Considering two lines after the for loop indented

```
[1, 2, 3]
['ONE', 'TWO', 'THREE']
{1: 'ONE', 2: 'TWO', 3: 'THREE'}
```

OR

Note: Considering only first line after the for loop to be indented

```
[1, 2, 3]
['THREE']
{1: 'ONE', 2: 'TWO', 3: 'THREE'}
```

(1 Mark for writing each correct line of output)

OR

(Full 3 Marks for writing indentation error)

SECTION D **(4x4=16)**

32. Suman has created a table named **WORKER** with a set of records to maintain the data of the construction sites, which consists of **WID**, **WNAME**, **WAGE**, **HOURS**, **TYPE**, and **SITEID**. After creating the table, she entered data in it, which is as follows : 4

WID	WNAME	WAGE	HOURS	TYPE	SITEID
W01	Ahmed J	1500	200	Unskilled	103
W11	Naveen S	520	100	Skilled	101
W02	Jacob B	780	95	Unskilled	101
W15	Nihal K	560	110	Semiskilled	NULL
W10	Anju S	1200	130	Skilled	103

(a) Based on the data given above, answer the following questions :

(i) Write the SQL statement to display the names and wages of those workers whose wages are between 800 and 1500.

Ans

```
SELECT WNAME, WAGE FROM WORKER
WHERE WAGE BETWEEN 800 AND 1500;
```

OR

```
SELECT WNAME, WAGE FROM WORKER
WHERE WAGE>=800 AND WAGE<=1500;
```

(½ Mark for correctly writing SELECT WNAME, WAGE FROM WORKER)
(½ Mark for correctly writing WHERE WAGE BETWEEN 800 AND 1500)

(ii) Write the SQL statement to display the record of workers whose SITEID is not known.

Ans

```
SELECT * FROM WORKER
WHERE SITEID IS NULL;
```

(½ Mark for correctly writing SELECT * FROM WORKER ***or Equivalent)***
(½ Mark for correctly writing WHERE SITEID IS NULL***)***

(iii) Write the SQL statement to display WNAME, WAGE and HOURS of all those workers whose TYPE is 'Skilled'.

Ans

```
SELECT WNAME, WAGE, HOURS FROM WORKER
WHERE TYPE="Skilled";
```

(½ Mark for writing SELECT WNAME, WAGE, HOURS FROM WORKER)
(½ Mark for writing WHERE TYPE = "Skilled")

(iv) Write the SQL statement to change the WAGE to 1200 of the workers where the TYPE is "Semiskilled"

Ans

```
UPDATE WORKER SET WAGE=1200
WHERE TYPE="Semiskilled";
```

(½ Mark for writing `UPDATE WORKER SET WAGE=1200`)

(½ Mark for writing `WHERE TYPE = "Semiskilled"`)

OR

(b) Considering the above given table `WORKER`, write the output on execution of the following SQL commands:

(i)
```
SELECT WNAME, WAGE*HOURS FROM WORKER
WHERE SITEID = 103;
```

Ans

WNAME	WAGE*HOURS
Ahmed J	300000
Anju S	156000

(1 Mark for writing correct output)

(ii)
```
SELECT COUNT(DISTINCT TYPE) FROM WORKER ;
```

Ans

COUNT(DISTINCT TYPE)
3

(1 Mark for writing correct output)

(iii)
```
SELECT MAX(WAGE), MIN(WAGE), TYPE FROM WORKER
GROUP BY TYPE;
```

Ans

MAX(WAGE)	MIN(WAGE)	TYPE
1500	780	Unskilled
1200	520	Skilled
560	560	Semiskilled

(1 Mark for writing correct output)

(iv)
```
SELECT WNAME, SITEID FROM WORKER WHERE TYPE="Unskilled"
ORDER BY HOURS;
```

Ans

WNAME	SITEID
Jacob B	101
Ahmed J	103

(1 Mark for writing correct output)

33. A csv file "P_record.csv" contains the records of patients in a hospital. Each record of the file contains the following data : 4

- Name of a patient
- Disease
- Number of days patient is admitted
- Amount

For example, a sample record of the file may be :

["Gunjan","Jaundice",4,15000]

Write the following Python functions to perform the specified operations on this file :

(i) Write a function `read_data()` which reads all the data from the file and displays the details of all the 'Cancer' patients.

(ii) Write a function `count_rec()` which counts and returns the number of records in the file.

Ans (i)

```
import csv
def read_data():
  F=open("P_record.csv","r")
  Records=list(csv.reader(F))
  for R in Records :
    if R[1]=="Cancer":
      print(R)
  F.close()
```

(ii)

```
def count_rec():
  with open("P_record.csv","r") as F:
    Records=list(csv.reader(F))
    print(len(Records))
```

(i)

(½ Mark for opening the csv file in correct mode)

(½ Mark for reading the records from csv file)

(½ Mark for iteration of records)

(½ Mark for checking and displaying the matched records correctly)

(ii)

(½ Mark for opening the csv file in correct mode)

(½ Mark for reading the records from csv file)

(1 Mark for finding/counting & displaying the number of records)

34. Assume that you are working in the IT Department of a Creative Art Gallery (CAG), which sells different forms of art creations like Paintings, Sculptures etc. The data of Art Creations and Artists are kept in tables **Articles** and **Artists** respectively. Following are few records from these two tables : 4x1 =4

Table : Articles

Code	A_Code	Article	DOC	Price
PL001	A0001	Painting	2018-10-19	20000
SC028	A0004	Sculpture	2021-01-15	16000
QL005	A0003	Quilling	2024-04-24	3000

Table : Artists

A_Code	Name	Phone	Email	DOB
A0001	Roy	595923	r@CrAG.com	1986-10-12
A0002	Ghosh	1122334	ghosh@CrAG.com	1972-02-05
A0003	Gargi	121212	Gargi@CrAG.com	1996-03-22
A0004	Mustafa	33333333	Mf@CrAg.com	2000-01-01

Note :

- The tables contain many more records than shown here.
- DOC is Date of Creation of an Article.

As an employee of CAG, you are required to write the SQL queries for the following :

(i) To display all the records from the **Articles** table in descending order of price.

(ii) To display the details of Articles which were created in the year 2020.

(iii) To display the structure of **Artists** table.

(iv) (a) To display the name of all Artists whose Article is Painting through Equi Join.

OR

(b) To display the name of all Artists whose Article is 'Painting' through Natural Join.

Ans

(i)
```
SELECT * FROM Articles
ORDER BY PRICE DESC;
```

(½ Mark for SELECT * FROM Articles or similar)

(½ Mark for** ORDER BY PRICE DESC**)

(ii)
```
SELECT * FROM Articles
 WHERE DOC LIKE '2020%';
 OR
SELECT * FROM Articles
 WHERE DOC>='2020-01-01' AND DOC<='2020-12-31';
 OR
SELECT * FROM Articles
 WHERE DOC BETWEEN '2020-01-01' AND '2020-12-31';
```

(½ Mark for** SELECT * FROM Articles *or similar)

(½ Mark for** WHERE DOC LIKE '2020%' *OR any other correct equivalent)

(iii)
```
DESC Artists;
```

(½ Mark for DESC*)*

(½ Mark for mentioning Artists after DESC)

(iv)

(a)
```
SELECT Name FROM Articles A1, Artists A2
WHERE A1.A_code = A2.A_code AND Article='Painting';
```
OR

Any other equivalent SQL statement

(½ Mark for `SELECT Name FROM Articles A1, Artists A2` *or similar)*

(½ Mark for `WHERE A1.A_code = A2.A_code AND Article='Painting';`*)*

OR

(b)
```
SELECT Name FROM Articles NATURAL JOIN Artists
WHERE Article = 'Painting';
```
OR

Any other equivalent SQL statement

(½ Mark for selecting from both the tables)

(½ Mark for correctly using condition/correctly using join option)

35. A table, named **THEATRE**, in **CINEMA** database, has the following structure : 4

Fields	Type
Th_ID	char(5)
Name	varchar(15)
City	varchar(15)
Location	varchar(15)
Seats	int

Write a function `Delete_Theatre()`, to input the value of `Th_ID` from the user and permanently delete the corresponding record from the table.

Assume the following for Python-Database connectivity :
Host : **localhost**, User : **root**, Password : **Ex2025**

Ans
```
import pymysql as pm    # OR import mysql.connector as pm
def Delete_Theatre():
  Mydb=pm.connect(host = 'localhost',
  user = 'root', password = 'Ex2025', database = 'CINEMA')
  MyCursor = Mydb.cursor()
  TID = input("Theatre ID:")
  Query = "DELETE FROM Theatre WHERE Th_ID='{}'".format(TID)
  # Query = f"DELETE FROM Theatre WHERE Th_ID='{TID}'"
  # Query = "DELETE FROM Theatre WHERE Th_ID='%s'"%(TID,)
  # Query = "DELETE FROM Theatre WHERE Th_ID='"+TID+"'"
  MyCursor.execute(Query)
  Mydb.commit()
  Mydb.close()
```

OR

```
import pymysql as pm    # OR import mysql.connector as pm
def Delete_Theatre():
  Mydb=pm.connect(host = 'localhost',
  user = 'root', password = 'Ex2025', database = 'CINEMA')
  MyCursor = Mydb.cursor()
  TID = input("Theatre ID:")
  Query = "DELETE FROM Theatre WHERE Th_ID=%s"
  Data=(TID,)
  MyCursor.execute(Query, Data)
  Mydb.commit()
  Mydb.close()
```

OR

any equivalent valid code

(1 Mark for creating correct connectivity)
(1 Mark for creating the cursor)
(1 Mark for correct formation of Query)
(½ Mark for correct execution of the query)
(½ Mark for correctly using commit())

Note:
(½ Mark for importing correct module, if the marks allocated are less than 4)

SECTION E (2x5=10)

36. A file, `PASSENGERS.DAT`, stores the records of passengers using the following structure : **5**

`[PNR, PName, BRDSTN, DESTN, FARE]`

where :

`PNR`	–	`Passenger Number (string type)`
`PName`	–	`Passenger Name (string type)`
`BRDSTN`	–	`Boarding Station Name (string type)`
`DESTN`	–	`Destination Station Name (string type)`
`FARE`	–	`Fare amount for the journey (float type)`

Write user defined functions in Python for the following tasks :

(i) `Create()` – to input data for passengers and write it in the binary file `PASSENGERS.DAT`.

(ii) `SearchDestn(D)` -to read contents from the file `PASSENGERS.DAT` and display the details of those Passengers whose `DESTN` matches with the value of D.

(iii) `UpdateFare()` - to increase the fare of all passengers by 5% and rewrite the updated records into the file `PASSENGERS.DAT`.

Ans

(i)

```
import pickle
def Create():
    F=open("PASSENGERS.DAT", "wb")
    PNR=input("PNR No:")
    PName=input("Name: ")
    BRDSTN=input("Boarding at: ")
    DESTN=input("Destination: ")
    FARE=float(input("Fare: "))
    Rec=[PNR,PName,BRDSTN,DESTN,FARE]
    pickle.dump(Rec,F)
    F.close()
```

OR

```
def Create():
   F=open("PASSENGERS.DAT", "wb")
   REC=[]
   while True:
     PNR=input("PNR No:")
     PName=input("Name: ")
     BRDSTN=input("Boarding at: ")
     DESTN=input("Destination: ")
     FARE=float(input("Fare: "))
     Rec.append([PNR,PName,BRDSTN,DESTN,FARE])
     C=input("More(Y/N)?")
     if C =='N':
       break
   pickle.dump(Rec,F)
   F.close()
```

OR

Any other equivalent code

(ii)

```
def SearchDestn(D):
  try:                          # To be ignored
    F=open("PASSENGERS.DAT", "rb")
    Rec=pickle.load(F)
    for R in Rec:
      if R[3]==D;
        print(R)
    F.close()
  except:                       # To be ignored
    print("File not found!")    # To be ignored
```

OR

```
def SearchDestn(D):
  F=open("PASSENGERS.DAT", "rb")
  try:
    while True:
       Rec=pickle.load(F)
       if Rec[3]==D;
          print(Rec)
    except EOFError:
      print("EOF reached")
    F.close()
```

(iii)

```
 def UpdateFare():
    try:
      FR=open("PASSENGERS.DAT", "rb+")
      Rec=pickle.load(FR)
      for I in range(len(Rec)):
        Rec[I][4]+=(Rec[I][4] * 0.05)
        # Rec[I][4]=Rec[I][4] * 1.05)
      print("Updation Done!")
      F.seek(0)
      pickle.dump(Rec, FR)
      FR.Close()
    except:
      print("File not found!")
```

OR

```
  def UpdateFare():
    FR=open("PASSENGERS.DAT", "rb")
    Rec=[]
    try:
      while True:
        R=pickle.load(FR)
        Rec.append(R)
    except:
      FR.close()
    for I in range(len(Rec)):
      Rec[I][4] = Rec[I][4] + (Rec[I][4] * 0.05)
      # Rec[I][4]=Rec[I][4] * 1.05)
    FP=open("PASSENGERS.DAT", "wb")
    pickle.dump(Rec, FP)
    FP.Close()
```

OR

Any other equivalent code

(i)

(½ Mark for opening the file in correct mode)
(½ Mark for accepting from user/writing on file)

(ii)

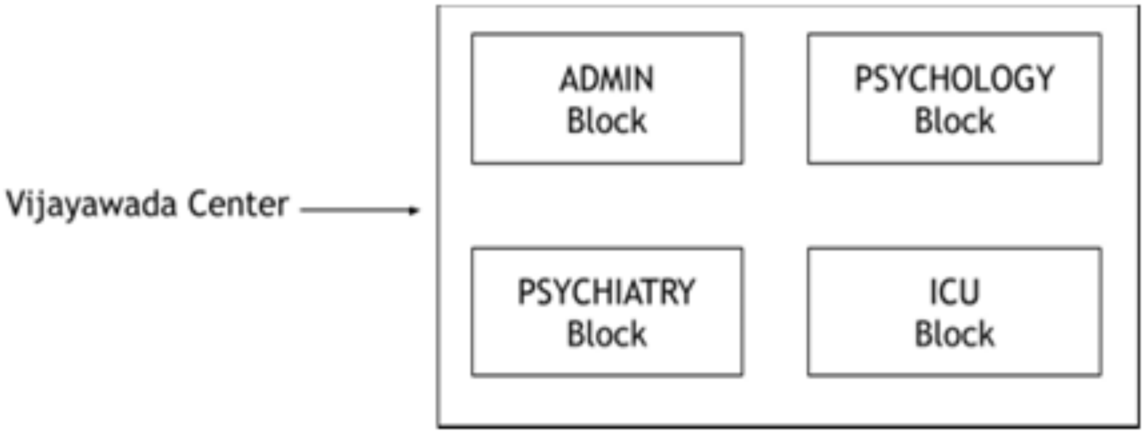
(½ Mark for opening the file in correct mode)
(½ Mark for reading each record)
(½ Mark for correctly checking the condition)
(½ Mark for correctly printing the details of passengers)

(iii)

(½ Mark for opening the file in correct mode)
(½ Mark for reading data)
(½ Mark for correctly modifying the Fare)
(½ Mark for writing the modified Fare in the Binary File)

37. 'Swabhaav' is a big NGO working in the field of Psychological Treatment and Counselling, having its Head Office in Nagpur. It is planning to set up a center in Vijayawada. The Vijayawada Center will have four blocks -ADMIN, PSYCHIATRY, PSYCHOLOGY, and ICU. You, as a Network Expert, need to suggest the best network-related solutions for them to resolve the issues/problems mentioned in questions (i) to (v), keeping the following parameters in mind :

5x1 =5



Block to Block distances (in metres) :

From	To	Distance
ADMIN	PSYCHIATRY	65 m
ADMIN	PSYCHOLOGY	65 m
ADMIN	ICU	65 m
PSYCHIATRY	PSYCHOLOGY	100 m
PSYCHIATRY	ICU	50 m
PSYCHOLOGY	ICU	50 m

Distance of Nagpur Head Office from Vijayawada Center = 700 km

Number of Computers in each block is as follows :

Block	No. of Computers
ADMIN	16
PSYCHIATRY	40
PSYCHOLOGY	19
ICU	20

(i)	Suggest the most appropriate location of the server inside the Vijayawada Center. Justify your choice.
(ii)	Which hardware device will you suggest to connect all the computers within each block of Vijayawada Center ?
(iii)	Draw a cable layout to efficiently connect various blocks within the Vijayawada Center.
(iv)	Where should the router be placed to provide internet to all the computers in the Vijayawada Center?
(v)	(a) The Manager at Nagpur wants to remotely access the computer in Admin block in Vijayawada. Which protocol will be used for this ? **OR** (b) Which type of Network (PAN, LAN, MAN or WAN) will be set up among the computers connected with Vijayawada Center ?

Ans (i) PSYCHIATRY Block as it has the maximum number of Computers.

OR

ADMIN Block as is generally the most secure.

OR

ADMIN Block as is closest to all the blocks.

OR

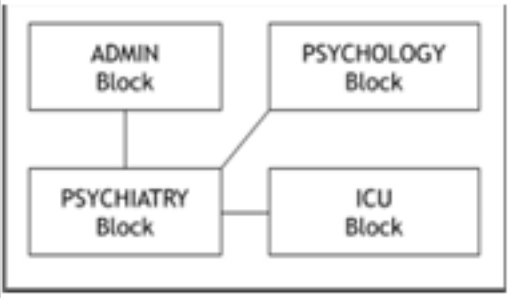
Any other location with valid justification.

(1 Mark for suggesting a block with valid justification)

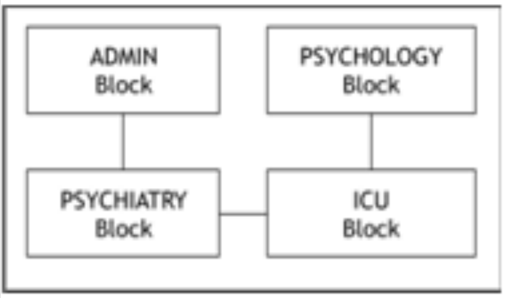
(ii) Switch/Hub/Router (Any one)

(1 Mark for writing correct answer)

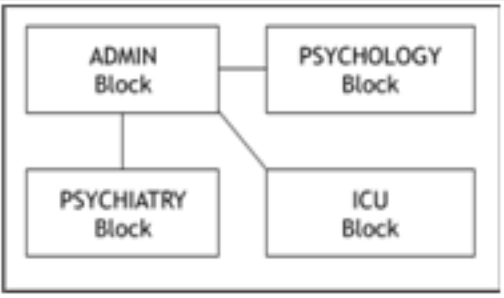
(iii)



OR



OR

	 ADMIN Block PSYCHOLOGY Block PSYCHIATRY Block ICU Block OR Any other valid efficient cable layout	
	(1 Mark for drawing the correct cable layout)	
	(iv) Router should be placed where the server is placed. ***Note:*** As per the recent network technologies, Router can be connected in any of the blocks as all the blocks are networked. So, the marks should be awarded accordingly.	
	(1 Mark for writing the correct answer)	
	(v) **(a)** TELNET OR **(b)** LAN or MAN or WAN (Not PAN)	
	(a) ***(1 Mark for writing the correct answer)*** ***OR*** **(b)** ***(1 Mark for writing the correct answer)***	