Marking Scheme
Strictly Confidential
(For Internal and Restricted use only)
Senior School Certificate Examination, 2023
SUBJECT NAME: COMPUTER SCIENCE (SUBJECT CODE: 083) (PAPER 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 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 given answer and even if reply is not from 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 delibration 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(√) wherever answer is correct. For wrong answer CROSS 'X" be marked. Evaluators will not put right (**✓**)while evaluating which gives an impression that answer is correct and no marks are awarded. **This is 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, 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 _____(example 0 to 80/70/60/50/40/30 marks as given in Question Paper) 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 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 answer.) ● Half or a part of 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 un assessed 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.

General Instructions:

*(i) This question paper contains five sections, **Section A to E**.*
*(ii) **All** questions are compulsory.*
*(iii) **Section A** have **18** questions carrying 1 mark each.*
*(iv) **Section B** has **7** Very Short Answer type questions carrying **2** marks each.*
*(v) **Section C** has **5** Short Answer type questions carrying **3** marks each.*
*(vi) **Section D** has **3** Long Answer type questions carrying **5** marks each.*
*(vii) **Section E** has **2** questions carrying **4** marks each. **One** internal choice is given in **Q.34 and 35**, against Part **(iii)** only.*
(viii) All programming questions are to be answered using Python Language only.

		SECTION - A	
1.		State True or False. "Identifiers are names used to identify a variable, function in a program".	1
	Ans	True	
		(1 mark for writing correct answer)	
2.		Which of the following is a valid keyword in Python ? (a) false (b) return (c) non_local (d) none	1
	Ans	(b) **return**	
		(1 mark for writing correct answer)	
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
	Ans	(b) **Tup.insert (2, 3)**	
		(1 mark for writing correct answer)	
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
	Ans	(a) **True**	
		(1 mark for writing correct answer)	

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

	Ans	(d) **('Amrit', '', 'Mahotsav @ 75')**	

		(1 mark for writing correct answer) ***OR*** ***(1 mark for mentioning Error in code OR no correct option)*** ***Note:*** ***print(A) is wrongly typed as print(a)***	
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
	Ans	(d) **a**	
		(1 mark for writing correct answer)	
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
	Ans	(a) **sort()**	
		(1 mark for writing correct answer)	
8.		Which of the following operators will return either True or False ? (a) **+=** (b) **!=** (c) **=** (d) ***=**	1
	Ans	(b) **!=**	
		(1 mark for writing correct answer) ***OR*** ***(1 mark for mentioning No option OR Error in question)*** ***Note:*** ***an operator does not return any values until it is part of an expression***	

9.		Which of the following statement(s) would give an error after executing the following code ?
		`Stud={"Murugan" : 100, "Mithu" : 95}  # Statement 1`
		`print (Stud[95])  # Statement 2`
		`Stud ["Murugan"]=99  # Statement 3`
		`print(Stud.pop())  # Statement 4`
		`print(Stud)  # Statement 5`
		
		(a) Statement 2 (b) Statement 3
		(c) Statement 4 (d) Statements 2 and 4
			1

	Ans	**(a) Statement 2** **OR** **(d) Statements 2 and 4**	
		(1 mark for writing correct answer as (a)) ***OR*** ***(1 mark for writing correct answer as (d))*** ***OR*** ***(1 mark for writing (a) and (c) as the correct answers)*** ***OR*** ***(Only ½ mark for writing (c) as the correct answer)***	
10.		Fill in the blank. _____ is a number of tuples in a relation. (a) Attribute (b) Degree (c) Domain (d) Cardinality	**1**
	Ans	(d) Cardinality	
		(1 mark for writing correct answer)	
11.		The syntax of **`seek ()`** is : **`file_object.seek (offset[, reference_point] )`** What is the default value of **`reference_point`** ? (a) 0 (b) 1 (c) 2 (d) 3	**1**
	Ans	(a) 0	
		(1 mark for writing correct answer)	

12.		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`**	1
	Ans	(b) **`ORDER BY`**	
		(1 mark for writing correct answer)	
13.		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) RADIOWAVES	1
	Ans	(c) MICROWAVES OR (d) RADIOWAVES	
		(1 mark for writing correct answer as (c) MICROWAVES) ***OR*** ***(1 mark for writing correct answer as (d) RADIOWAVES)***	
14.		What will the following expression be evaluated to in Python ? **`print(4+3*5/3-5%2)`** (a) **`8.5`** (b) **`8.0`** (c) **`10.2`** (d) **`10.0`**	1
	Ans	(b) **`8.0`**	
		(1 mark for writing correct answer)	
15.		Which function returns the sum of all elements of a list ? (a) **`count()`** (b) **`sum()`** (c) **`total()`** (d) **`add()`**	1
	Ans	(b) **`sum()`**	
		(1 mark for writing correct answer)	
16.		fetchall() method fetches all rows in a result set and returns a : (a) Tuple of lists (b) List of tuples (c) List of strings (d) Tuple of strings	1
	Ans.	(b) List of tuples	
		(1 mark for writing correct answer)	

Q. 17 and **18** are ASSERTION (A) and REASONING (R) based questions. Mark the correct choice as (a) Both (A) and (R) are true and (R) is the correct explanation for (A). (b) Both (A) and (R) are true and (R) is not the correct explanation for (A). (c) (A) is true but (R) is false. (d) (A) is false but (R) is true.			
17.		**Assertion (A) :** To use a function from a particular module, we need to import the module. **Reason (R) :** import statement can be written anywhere in the program, before using a function from that module.	1
	Ans.	(b) Both (A) and (R) are true and (R) is not the correct explanation for (A)	
		(1 mark for writing correct answer) ***OR*** ***(½ mark for writing (a) as the correct option)***	
18.		**Assertion (A):** A stack is a LIFO structure. **Reason (R) :** Any new element pushed into the stack always gets positioned at the index after the last existing element in the stack	1
	Ans	(c) (A) is true but (R) is false.	
		(1 mark for writing (c) as the correct option) ***OR*** ***(1 mark for writing (b) as the correct option)*** ***OR*** ***(1 mark for writing (a) as the correct option)***	
SECTION B			

19.		Atharva is a Python programmer working on a program to find and return the maximum value from the list. The code written below has syntactical errors. Rewrite the correct code and underline the corrections made.
		`def max_num (L) :`
		`  max=L(0)`
		`  for a in L :`
		`  if a > max`
		`  max=a`
		`  return max`
			2

	Ans	**def max_num (L) :** **max=L[0]** **for a in L:** **if a > max:** **max=a** **return max**	
		(1½ marks for correcting all 3 mistakes) ***(½ mark for underlining the corrections)*** ***OR*** ***(1 mark for correcting only 2 mistakes)*** ***(½ mark for underlining the corrections)*** ***OR*** ***(½ mark for correcting only 1 mistake)*** ***(½ mark for underlining the correction)***	
20.	(a)	Differentiate between wired and wireless transmission.	2
	Ans	In case of wired or guided transmission, there is a physical link made of wire/cable through which data in terms of signals are propagated between the nodes. These are usually metallic cable, fiber-optic cable, etc. In case of wireless or unguided transmission, data travels in air in terms of electromagnetic waves using an antenna. These are usually bluetooth, microwaves, infrared, radio waves, etc. OR In case of wired transmission, the devices in the network are connected using cables. Wireless transmission uses waves/rays to connect devices. OR Any other valid difference (any one)	
		(2 marks for differentiating with or without examples) ***OR*** ***(1 mark each for defining each type with or without examples)*** ***OR*** ***(½ mark each for mentioning example of each type)***	

		OR	
	(b)	Differentiate between URL and domain name with the help of an appropriate example.	
	Ans	URL is the complete internet address of a webpage while Domain name is just the name of the organisation/individual entity along with top-level internet domains such as com, edu, gov, etc. Example : URL: https://www.ncert.nic.in/textbook/textbook.htm Domain Name: ncert.nic.in OR www.ncert.nic.in OR any valid definition along with examples	2
		(2 marks for writing any one difference with the help of examples) ***OR*** ***(2 marks for writing examples to differentiate correctly)*** ***OR*** ***(1 mark only for writing any one difference without examples)***	

21.	(a)	Given is a Python list declaration :
		`Listofnames=["Aman","Ankit","Ashish","Rajan","Rajat"]`
		Write the output of :
		`print (Listofnames [-1:-4:-1])`
			1

	Ans	`['Rajat', 'Rajan', 'Ashish']`	
		(1 mark for writing the correct output with/without formatting) ***OR*** ***(½ mark for mentioning the correct names -'Ashish', 'Rajan', 'Rajat' but not in correct order)***	

	(b)	Consider the following tuple declaration :
		`tup1=(10,20,30,(10,20,30),40)`
		Write the output of :
		`print(tupl.index(20))`
			1

	Ans	`1`	
		(1 mark for writing the correct output)	

<table>
<tr><td>22.</td><td></td><td>Explain the concept of ‘‘Alternate Key’’ in a Relational Database Management System with an appropriate example.</td><td>2</td></tr>
<tr><td></td><td>Ans</td><td>Alternate Keys are all the Candidate Keys of a RDBMS table, which have not been used as a Primary Key.
Example:
<table><tr><td>RegNo</td><td>AadhaarNo</td><td>Name</td></tr><tr><td>123456</td><td>123456789012</td><td>Abraham Sen</td></tr><tr><td>123458</td><td>123456789123</td><td>Umeed Singh</td></tr></table>In this example, any one of the RegNo and AadhaarNo can be used as a Primary Key. If RegNo is used as the Primary Key then AadhaarNo is the Alternate Key.</td><td></td></tr>
<tr><td></td><td></td><td>(2 mark for explaining Alternate Keys with example)
OR
(1 mark for writing example of Alternate Keys without any explanation)
OR
(1 mark only for writing the definition of Alternate Keys)</td><td></td></tr>
<tr><td>23.</td><td>(a)</td><td>Write the full forms of the following:
(i) HTML
(ii) TCP</td><td>2</td></tr>
<tr><td></td><td>Ans</td><td>(i) HTML : Hyper Text Markup Language
(ii) TCP : Transmission Control Protocol</td><td></td></tr>
<tr><td></td><td></td><td>(½ mark for writing each of the two full forms)</td><td></td></tr>
<tr><td></td><td>(b)</td><td>What is the need of Protocols ?</td><td></td></tr>
<tr><td></td><td>Ans</td><td>Protocols are needed for communication between computers.
OR
any valid need/definition/explanation of protocol.</td><td></td></tr>
<tr><td></td><td></td><td>(1 mark for writing any one need OR definition OR explanation)</td><td></td></tr>
</table>

24.	(a)	Write the output of the code given below :
		`def short_sub (lst,n) :`
		`  for i in range (0,n) :`
		`  if len (lst)>4:`
		`  lst [i]=lst [i]+lst[i]`
		`  else:`
		`  lst[i]=lst[i]`
		`subject=['CS','HINDI','PHYSICS','CHEMISTRY','MATHS']`
		`short_sub(subject,5)`
		`print(subject)`
			2

	Ans	Output: `['CSCS','HINDIHINDI','PHYSICSPHYSICS','CHEMISTRYCHEMISTRY','MATHSMATHS']`	
		(2 Marks for writing the correct output with or without formatting)	

	(b)	**OR**
		Write the output of the code given below:
		`a =30`
		`def call (x):`
		`  global a`
		`  if a%2==0:`
		`  x+=a`
		`  else:`
		`  x-=a`
		`  return x`
		`x=20`
		`print(call(35),end="#")`
		`print(call(40),end= "@")`
			2

	Ans.	65#70@	
		(½ marks each for the four components 65, #, 70, @ with or without formatting)	
25.	(a)	Differentiate between CHAR and VARCHAR data types in SQL with appropriate example.	2

		CHAR is of fixed length character(string) data type, which means, declaring CHAR (10) implies to reserve spaces for 10 characters. If data does not have 10 characters (e.g., 'CITY' has four characters), MySQL fills the remaining 6 characters with spaces padded on the right. VARCHAR is a variable-length character(string) data type. Declaring VARCHAR (30) means a maximum of 30 characters can be stored but the actual allocated bytes will depend on the length of the entered string. So 'CITY' in VARCHAR (30) will occupy space needed to store 4 characters only and the remaining 26 will be released. **OR** CHAR data type is used to store strings of fixed length, while the VARCHAR data type is used to store strings of variable-length. Eg, to store 'India', VARCHAR(20) occupies only 5 bytes whereas CHAR(20) occupies 20 bytes. **OR** any other valid difference and examples	
		(2 Marks for mentioning one difference with the help of examples) ***OR*** ***(1 Mark each for writing explanation of each type with example)*** ***OR*** ***(½ Mark for each term for mentioning only purpose without example)***	
	(b)	**OR** Name any two DDL and any two DML commands.	2
		DDL – CREATE, ALTER, DROP (OR any two valid DDL command) DML – INSERT, UPDATE, DELETE, SELECT (OR any two valid DML command)	
		(½ Mark each for the two DDL commands) *(½ Mark each for the two DML commands)*	

<table>
<tr><td></td><td></td><td>SECTION-C</td><td></td></tr>
<tr><td>26</td><td>(a)</td><td>Consider the following tables – LOAN and BORROWER:

Table : LOAN
<table><tr><td>LOAN_NO</td><td>B_NAME</td><td>AMOUNT</td></tr><tr><td>L-170</td><td>DELHI</td><td>3000</td></tr><tr><td>L-230</td><td>KANPUR</td><td>4000</td></tr></table>
Table : BORROWER
<table><tr><td>CUST_NAME</td><td>LOAN_NO</td></tr><tr><td>JOHN</td><td>L-171</td></tr><tr><td>KRISH</td><td>L-230</td></tr><tr><td>RAVYA</td><td>L-170</td></tr></table>
How many rows and columns will be there in the natural join of these two tables ?</td><td>1</td></tr>
<tr><td></td><td>Ans.</td><td>Rows : 2
Columns : 4</td><td></td></tr>
<tr><td></td><td></td><td>(½ Mark each for correct values of Rows and Columns)</td><td></td></tr>
</table>

(b) Write the output of the queries (i) to (iv) based on the table, WORKER given below: 2

TABLE: WORKER

W_ID	F_NAME	L_NAME	CITY	STATE
102	SAHIL	KHAN	KANPUR	UTTAR PRADESH
104	SAMEER	PARIKH	ROOP NAGAR	PUNJAB
105	MARY	JONES	DELHI	DELHI
106	MAHIR	SHARMA	SONIPAT	HARYANA
107	ATHARVA	BHARDWAJ	DELHI	DELHI
108	VEDA	SHARMA	KANPUR	UTTAR PRADESH

(i) `SELECT F_NAME, CITY FROM WORKER ORDER BY STATE DESC;`

Ans.

F_NAME	CITY
SAHIL	KANPUR
VEDA	KANPUR
SAMEER	ROOP NAGAR
MAHIR	SONIPAT
MARY	DELHI
ATHARVA	DELHI

(½ Mark for writing the correct output)

(ii) `SELECT DISTINCT (CITY) FROM WORKER;`

Ans.

CITY
KANPUR
ROOP NAGAR
DELHI
SONIPAT

(½ Mark for writing the correct output)

(iii) `SELECT F_NAME, STATE FROM WORKER WHERE L_NAME LIKE '_HA%';`

Ans.

F_NAME	STATE
SAHIL	UTTAR PRADESH
MAHIR	HARYANA
ATHARVA	DELHI
VEDA	UTTAR PRADESH

(½ Mark for writing the correct output)

(iv) `SELECT CITY, COUNT (*) FROM WORKER GROUP BY CITY;`

	Ans.	<table><tr><td>CITY</td><td>COUNT (*)</td></tr><tr><td>KANPUR</td><td>2</td></tr><tr><td>ROOP NAGAR</td><td>1</td></tr><tr><td>DELHI</td><td>2</td></tr><tr><td>SONIPAT</td><td>1</td></tr></table>	
		(½ Mark for writing the correct output)	
		Note for (i) to (iv) : ***1. Ignore the output header and cases of the outputs*** ***2. ½ mark for each query, for writing any 2 correct rows in the output*** ***3. Order of the output rows/columns should be ignored.***	
27.	(a)	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.**	3

Ans.

```
def LongLines():
    myfile=open('LINES.TXT')      # ignore 'r' mode
    all_lines=myfile.readlines()
    for aline in all_lines:
        if(len(aline.split()>=10):
            print(aline)
    myfile.close()
```

OR

```
def LongLines():
    with open ('LINES.TXT') as myfile: # ignore 'r' mode
        all_lines=myfile.readlines()
        for aline in all_lines:
            if(len(aline.split())>=10):
                print(aline)
```

OR

```
def LongLines():
    myfile=open('LINES.TXT')      # ignore 'r' mode
    for aline in myfile:
        if(len(aline.split())>=10):
            print(aline)
    myfile.close()
```

OR

```
def LongLines():
    myfile=open('LINES.TXT')      # ignore 'r' mode
    s1=" "
    while s1:
        s1=myfile.readline()
        words=s1.split()
        if(len(words)>=10):
            print(s1)
    myfile.close()
```

OR

any other valid Python code to serve the purpose.

		(½ mark for the function header) *(½ mark for opening the file)* *(½ mark for reading the file correctly)* *(1 mark for checking the number of words in each line)* *(½ mark for displaying the desired lines)*	
		OR	
	(b)	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	3

	Ans.	`def count_Dwords():`
		`  with open ("Details.txt", 'r') as F:  # ignore 'r'`
		`  S=F.read()`
		`  Wlist = S.split()`
		`  count = 0`
		`  for W in Wlist:`
		`  if W[-1].isdigit():`
		`  count+=1`
		`  print("Number of words ending with a digit are",count)`
		
		OR
		`def count_Dwords():`
		`  count=0`
		`  myfile=open("Details.txt")`
		`  S=myfile.read()`
		`  Wlist=S.split()`
		`  for W in Wlist:`
		`  if i[-1] in "0123456789":`
		`  count=count+1`
		`  myfile.close()`
		`  print("Number of words ending with a digit are",count)`	

OR

```
def count_Dwords():
  myfile=open("Details.txt")
  count=0
  for line in myfile:
        s1=line.split()
        for i in s1:
            if i[-1] in "0123456789":
                count=count+1
  print("Number of words ending with a digit are",count)
  myfile.close()
```

OR

any other valid Python code to serve the purpose.

(½ mark for the function header)
(½ mark for opening the file)
(½ mark for reading the file correctly)
(1 mark for checking the condition)
(½ mark for displaying the desired lines)

28. (a) Write the outputs of the SQL queries (i) to (iv) based on the relations COMPUTER and SALES given below : **2**

Table : COMPUTER

PROD_ID	PROD_NAME	PRICE	COMPANY	TYPE
P001	MOUSE	200	LOGITECH	INPUT
P002	LASER PRINTER	4000	CANON	OUTPUT
P003	KEYBOARD	500	LOGITECH	INPUT
P004	JOYSTICK	1000	IBALL	INPUT
P005	SPEAKER	1200	CREATIVE	OUTPUT
P006	DESKJET PRINTER	4300	CANON	OUTPUT

Table : SALES

PROD_ID	QTY_SOLD	QUARTER
P002	4	1
P003	2	2
P001	3	2
P004	2	1

(i) **SELECT MIN(PRICE), MAX(PRICE) FROM COMPUTER;**

Ans.

MIN(PRICE)	MAX(PRICE)
200	4300

(½ mark for correct output)

(ii) SELECT COMPANY, COUNT(*) FROM COMPUTER GROUP BY COMPANY HAVING COUNT(COMPANY) > 1;

Ans.

COMPANY	COUNT(*)
LOGITECH	2
CANON	2

(½ mark for correct output)

(iii) **SELECT PROD_NAME, QTY_SOLD FROM COMPUTER C, SALES S WHERE C.PROD_ID=S.PROD_ID AND TYPE = 'INPUT';**

Ans.

PROD_NAME	QTY_SOLD
MOUSE	3
KEYBOARD	2
JOYSTICK	2

		(½ mark for correct output)	
		(iv) **SELECT PROD_NAME, COMPANY, QUARTER FROM COMPUTER C, SALES S WHERE C.PROD_ID=S. PROD_ID;**	
		<table><tr><td>PROD_NAME</td><td>COMPANY</td><td>QUARTER</td></tr><tr><td>MOUSE</td><td>LOGITECH</td><td>2</td></tr><tr><td>LASER PRINTER</td><td>CANON</td><td>1</td></tr><tr><td>KEYBOARD</td><td>LOGITECH</td><td>2</td></tr><tr><td>JOYSTICK</td><td>IBALL</td><td>1</td></tr></table>	
		(½ mark for correct output)	
	(b)	Write the command to view all databases.	**1**
	Ans.	SHOW DATABASES;	
		(1 mark for writing the correct command) ***Note: punctuation mark (;) and cases can be ignored.***	
29.		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]**	**3**
	Ans.	**def EOReplace(L):** **for i in range(len(L)):** **if L[i]%2==0:** **L[i]=L[i]+1** **else:** **L[i]=L[i]-1** **print(L)**	

		OR **def EOReplace():** **L=[]** **ch = 'y'** **while ch == 'y' or ch == 'Y':** **x = int(input('give item'))** **L.append(x)** **ch= input('do you want to enter more y/n ')** **for i in range(len(L)):** **if L[i]%2==0:** **L[i]=L[i]+1** **else:** **L[i]=L[i]-1** **print(L)** **OR** **def EOReplace():** **L=eval(input("Enter list="))** **Size=len(L)** **for i in range(Size):** **if L[i]%2==0:** **L[i]=L[i]+1** **else:** **L[i]=L[i]-1** **print(L)** **OR** any other valid Python code to serve the purpose.	
		(½ mark for correct function header) ***(½ mark for getting the list)*** ***(½ mark for correct loop)*** ***(½ mark for checking the condition)*** ***(½ mark for incrementing the even values)*** ***(½ mark for decrementing the odd values)***	

30.	(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`
			3

	Ans.	**`Hotel=[]`** **`Customer=[["Siddarth","Delux"],["Rahul","Standard"],["Jerry","Delux"]]`** **`def Push_Cust():`** **`    for rec in Customer:`** **`        if rec[1]=="Delux":`** **`            Hotel.append(rec[0])`** **`def Pop_Cust():`** **`    while len(Hotel)>0:`** **`        print(Hotel.pop())`** **`    else:`** **`        print("Underflow")`**	

OR

```
top=0
def Push_Cust(Hotel,Customer):
    global top
    for cust_rec in Customer:
        if cust_rec[1]=="Delux":
            Hotel.insert(top, cust_rec[0])
            top=top+1

def Pop_Cust(Hotel):
    global top
    while len(Hotel)>0:
        print(Hotel.pop())
        top=top-1
    else:
        print("Underflow")
```

OR

Any other valid Python code to serve the purpose.

(½ mark for defining correct function header (Push_Cust())
(½ mark for correct loop in function Push_Cust())
(½ mark for checking the condition and appending the data in Push_Cust())
(½ mark for defining correct function header (Pop_Cust())
(½ mark for correct loop in function Pop_Cust())
(½ mark for deleting and displaying the data in Pop_Cust())

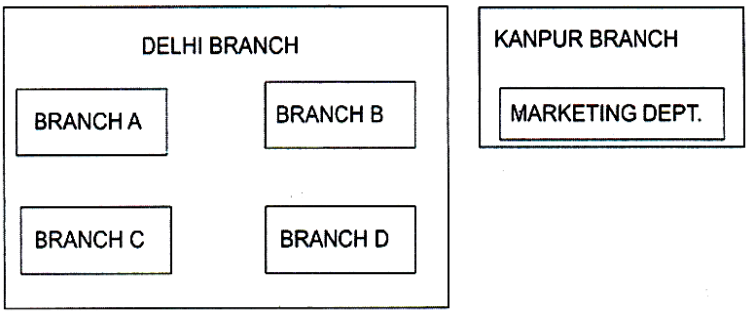
OR

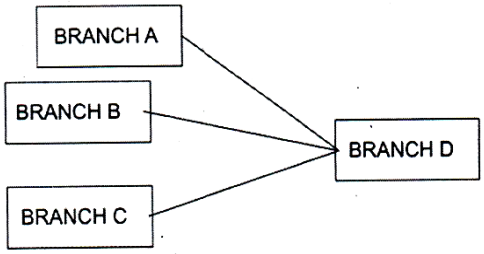
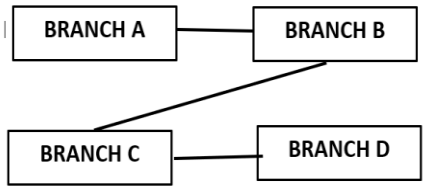
(b) Write a function in Python, `Push (Vehicle)` where, Vehicle is a dictionary containing details of vehicles - `{Car_Name: Maker}`. The function should push the name of car manufactured by 'TATA' (including all the possible cases like Tata, TaTa, etc.) to the stack. For example: If the dictionary contains the following data : **3**

```
Vehicle={"Santro":"Hyundai","Nexon":"TATA","Safari":"Tata"}
```

The stack should contain

```
Safari
Nexon
```

	Ans	**stack=[]** **def Push(Vehicle) :** **for v_name in Vehicle :** **if Vehicle[v_name].upper()=="TATA" :** **stack.append(v_name)** **OR** **stack=[]** **def Push(Vehicle) :** **for v_name in Vehicle :** **if Vehicle[v_name] in ("TATA", "TaTa","tata","Tata"):** **stack.append(v_name)** **OR** **Any other valid Python code to serve the purpose.**	
		(½ mark for defining correct function header) ***(½ mark for correct loop)*** ***(1 mark for checking the condition)*** ***(1 mark for appending the data)***	
		SECTION - D	
31		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:  Distance between various branches is as follows : Branch | Distance Branch A to Branch B | 40 m Branch A to Branch C | 80 m Branch A to Branch D | 65 m Branch B to Branch C | 30 m Branch B to Branch D | 35 m Branch C to Branch D | 15 m Delhi Branch to Kanpur | 300 km	

		Number of computers in each of the branches : | Branch	Number of Computers
---	---
Branch A	15
Branch B	25
Branch C	40
Branch D	115		
	(i)	Suggest the most suitable place to install the server for the Delhi branch with a suitable reason.	1
	Ans	Branch D, as it has maximum number of computers OR any other location with valid justification	
		(½ mark for naming the Branch and ½ mark for correct justification)	
	(ii)	Suggest an ideal layout for connecting all these branches within Delhi.	**1**
	Ans	 (Based on Server Location) **OR**  (Based on minimum distance between branches)	
		(1 mark for correctly drawing any one valid layout) ***OR*** ***(1 mark for correctly suggesting name of any one valid topology)***	
	(iii)	Which device will you suggest, that should be placed in each of these branches to efficiently connect all the computers within these branches ?	**1**
	Ans.	Switch/Hub/Router	
		(1 mark for suggesting the correct device)	

	(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.	**1**
	Ans.	WAN – as the network is spread across different geographical locations of the country.	
		(½ mark for writing the correct type of network) ***(½ mark for correct justification)***	
	(v)	Suggest a protocol that shall be needed to provide help for transferring of files between Delhi and Kanpur branch.	**1**
	Ans.	FTP	
		(1 mark for writing the correct answer as FTP) ***OR*** ***(1 mark for any other valid protocol that can be used to provide help for transferring of files)***	

32	(a)	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
		20#25#25
		(ii) 5#25#20
		25#20#15
		(iii) 30#20#20
		20#25#25
		(iv) 10#15#25#
		15#20#10#
			2

	Ans.	**(i) 10#25#15** **20#25#25**	
		(2 marks for the correct answer) ***(Deduct ½ mark each for any other additional option along with correct option)***	

	(b)	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.
		
		`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")`
			3

	Ans.	Statement 1 : **mysql.connector** **OR any other valid library used for Python MySQL connectivity** Statement 2: **mycursor.execute("DELETE FROM employee WHERE E_code='E101'")** Statement 3 : **mydb.commit()**	
		(1 mark for writing any valid library for Statement 1) ***(½ mark for writing correct object & function name in Statement 2)*** ***(½ mark for writing correct Query in Statement 2)*** ***(½ mark for writing correct object name in Statement 3)*** ***(½ mark for writing correct function name in Statement 3)***	

		OR	

	(a)	Predict the output of the code given below :
		`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")`
			2

	Ans.	**N1@3**	
		(½ mark for writing each correct character with or without formatting)	
	(b)	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.
		
		`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)`
			3

	Ans.	Statement 1: **mysql.connector** **OR any other valid library used for Python MySQL connectivity** Statement 2: **mycursor.execute("select * from employee where City='Delhi '")** Statement 3: **mycursor.fetchall()**	
		(1 mark for writing any valid library for Statement 1) ***(½ mark for writing correct object & function name in Statement 2)*** ***(½ mark for writing correct Query in Statement 2)*** ***(½ mark for writing correct object name in Statement 3)*** ***(½ mark for writing correct function name in Statement 3)***	
33	(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.	**5**

	Ans	CSV files ● can be viewed in spreadsheets ● module CSV has to be imported Text files ● can be viewed in the text editor ● No specific module required to be imported (any other valid difference - any one) **import csv** **def COURIER_ADD() :** **f1=open("courier.csv","a",newline="\n")** **writ=csv.writer(f1)** **cid=int(input("Enter the Courier id"))** **s_name=input ("Enter the Sender Name")** **Source=input("Enter the Source Address")** **destination=input("Enter Destination Name")** **detail=[cid,s_name,Source,destination]** **writ.writerow (detail)** **f1.close()**	
		def COURIER_SEARCH() : **f1=open("courier.csv","r") # ignore newline** **detail=csv.reader(f1)** **name=input("Enter the Destination Name to be searched")** **for i in detail :** **if i[3]==name:** **print("Details of courier are: ",i)** **COURIER_ADD()** **COURIER_SEARCH()** **OR** **Any other valid Python code to serve the purpose.**	
		(1 mark for any one correct difference between CSV and Text file) ***(½ mark for correctly importing csv module)*** ***(½ mark for opening in the file in right mode in*** **COURIER_ADD()** ***)*** ***(½ mark for reading values from the user)*** ***(½ marks correct uses of writerow/writerows)*** ***(½ mark for opening in the file in right mode in*** **COURIER_SEARCH()** ***)*** ***(½ marks correct uses of reader object)*** ***(½ mark for displaying desired output)*** ***(½ mark for correctly calling*** **COURIER_ADD()** ***and*** **COURIER_SEARCH()** ***)***	
		OR	

	(b)	Why is it 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.	5
	Ans	It is important to close the file before exiting as Python makes sure that any unwritten or unsaved data is flushed off to the file before it is closed. **OR** **Any other valid Python code to serve the purpose.**	

```
import csv
def Add_Book():
   f1=open("Book.csv","a",newline="\n")
   writ=csv.writer(f1)
   book_ID=int(input("Enter the Book id"))
   B_name=input("Enter the Book Name")
   pub=input("Enter the Publisher Name")
   detail=[book_ID, B_name,pub]
   writ.writerow(detail)
   f1.close()

def Search_Book ():
   f1=open("Book.csv","r")   # ignore newline
   detail=csv.reader(f1)
   name=input("Enter the Publisher Name to be searched")
   pub_count=0
   for i in detail :
      if i[2]==name:
            pub_count+=1
   print("NUMBER OF BOOKS: ",pub_count)

Add_Book()
Search_Book()
```

		(1 mark for writing correct purpose of closing a file) ***(½ mark for correctly importing csv module)*** ***(½ mark for opening in the file in right mode in `Add_Book()`)*** ***(½ mark for reading values from the user)*** ***(½ marks correct uses of writerow/writerows)*** ***(½ mark for opening in the file in right mode in `Search_Book()`)*** ***(½ marks correct uses of reader object)*** ***(½ mark for displaying desired output)*** ***(½ mark for correctly calling Add_Book() and Search_Book())***	
		SECTION E	
34		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.	

LABNO	LAB_NAME	INCHARGE	CAPACITY	FLOOR
L001	CHEMISTRY	DAISY	20	I
L002	BIOLOGY	VENKY	20	II
L003	MATH	PREETI	15	I
L004	LANGUAGE	DAISY	36	III
L005	COMPUTER	MARY KOM	37	II

		Based on the data given above, answer the following questions :	
	(i)	Identify the columns which can be considered as Candidate keys.	**1**
	Ans.	**`Candidate keys: LABNO and LAB_NAME`**	
		(1 Mark for correctly writing both names of Candidate keys) ***OR*** ***(½ Mark for specifying any one candidate key correctly)***	
	(ii)	Write the degree and cardinality of the table.	**1**
	Ans	**`Degree = 5`** **`Cardinality = 5`**	
		(½ Mark for writing value of Degree correctly) ***(½ Mark for writing value of Cardinality correctly)***	

	(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 '**I**' Floor.	**2**
	Ans	**(a) INSERT INTO LAB** **VALUES('L006','PHYSICS','RAVI',25,'II');** **(b) UPDATE LAB SET CAPACITY=CAPACITY+10 WHERE FLOOR='I';**	
		(½ Mark for writing the INSERT INTO LAB part correctly) ***(½ Mark for writing the* `VALUES` *part correctly)*** ***(½ Mark for writing the UPDATE LAB SET part correctly)*** ***(½ Mark for writing the* `CAPACITY=CAPACITY+10 WHERE FLOOR="I"` *part correctly)***	
		OR **(Option for part (iii) only)**	
	(iii)	Write the statements to : (a) Add the constraint PRIMARY KEY to a column LABNO in the table. (b) Delete the table LAB.	**2**
	Ans	**(a) ALTER TABLE LAB ADD PRIMARY KEY (LABNO);** **(b) DROP TABLE LAB;**	
		(a) (½ Mark for writing* `ALTER TABLE LAB` *part correctly) ***(½ Mark for writing* `ADD PRIMARY KEY(LABNO)` *part correctly)*** ***(b) (1 Mark for writing query correctly)***	
35		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.	

		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.	**1**
	Ans	**Statement 1:** **open ("Cust_file.dat", "wb")**	
		(1 Mark for correctly writing missing Statement 1) ***Note: 'ab' mode also be considered***	
	(ii)	Which statement should Shreyas fill in Statement 2 to check whether quantity is less than 10.	**1**
	Ans	**Statement 2:** **qty<10 :**	
		(1 Mark for correctly writing missing Statement 2)	
	(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.	**2**
	Ans	**Statement 3:** **pickle.dump(c_detail,bin_file)** **Statement 4:** **break**	
		(1 Mark for correctly writing missing Statement 3) ***(1 Mark for correctly writing missing Statement 4)***	

		OR **(Option only for part (iii))**	
	(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?	**2**
	Ans	**`Statement 5: bin_file.close()`** **`Statement 6: write_bin()`**	
		(1 Mark for correctly writing missing Statement 5) ***(1 Mark for correctly writing missing Statement 6)***	