Computer Science

XII – STANDARD (CBSE)

Time Allowed: 3 hours   **Maximum Marks: 70**

General Instructions:

1. This question paper contains five sections, Section A to E.
2. All questions are compulsory.
3. Section A have 18 questions carrying 01 mark each.
4. Section B has 07 Very Short Answer type questions carrying 02 marks each.
5. Section C has 05 Short Answer type questions carrying 03 marks each.
6. Section D has 03 Long Answer type questions carrying 05 marks each.
7. Section E has 02 questions carrying 04 marks each. One internal choice is given in Q35 against part c only.
8. All programming questions are to be answered using Python Language only.

SECTION A		
1.	State True or False "Variable declaration is implicit in Python."	1
2.	Which of the following is an invalid datatype in Python? (a) Set (b) None (c)Integer (d)Real	1

3.	Given the following dictionaries
	
	dict_exam={"Exam":"AISSCE", "Year":2023} dict_result={"Total":500, "Pass_Marks":165}
	
	Which statement will merge the contents of both dictionaries?
	    a. dict_exam.update(dict_result)
	    b. dict_exam + dict_result
	    c. dict_exam.add(dict_result)
	    d. dict_exam.merge(dict_result)
		1

4.	Consider the given expression:
	not True and False or True
	Which of the following will be 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: a = "Year 2022 at All the best"	1

	a = a.split('2') b = a[0] + ". " + a[1] + ". " + a[3] print (b) (a) Year . 0. at All the best (b) Year 0. at All the best (c) Year . 022. at All the best (d) Year . 0. at all the best	
6.	Which of the following mode in file opening statement results or generates an error if the file does not exist? (a) a+ (b) r+ (c) w+ (d) None of the above	1
7.	Fill in the blank: _____command is used to remove primary key from the table in SQL. (a) update (b)remove (c) alter (d)drop	1
8.	Which of the following commands will delete the table from MYSQL database? (a) DELETE TABLE (b) DROP TABLE (c) REMOVE TABLE (d) ALTER TABLE	1

9.	Which of the following statement(s) would give an error after executing the following code?
	
	S="Welcome to class XII" # Statement 1
	print(S) # Statement 2
	S="Thank you" # Statement 3
	S[0]= '@' # Statement 4
	S=S+"Thank you" # Statement 5
	
	(a) Statement 3
	(b) Statement 4
	(c) Statement 5
	(d) Statement 4 and 5
		1

10.	Fill in the blank: _____is a non-key attribute, whose values are derived from the primary key of some other table. (a) Primary Key (b) Foreign Key (c) Candidate Key	1

	(d) Alternate Key	
11.	The correct syntax of seek() is: (a) file_object.seek(offset [, reference_point]) (b) seek(offset [, reference_point]) (c) seek(offset, file_object) (d) seek.file_object(offset)	1
12.	Fill in the blank: The SELECT statement when combined with_____clause, returns records without repetition. (a) DESCRIBE (b) UNIQUE (c) DISTINCT (d) NULL	1
13.	Fill in the blank: _____is a communication methodology designed to deliver both voiceand multimedia communications over Internet protocol. (a) VoIP (b) SMTP (c) PPP (d)HTTP	1
14.	What will the following expression be evaluated to in Python? print(15.0 / 4 + (8 + 3.0)) (a) 14.75 (b)14.0 (c) 15 (d) 15.5	1
15.	Which function is used to display the total number of records from table in a database? (a) sum(*) (b) total(*) (c) count(*) (d) return(*)	1
16.	To establish a connection between Python and SQL database, connect()is used. Which of the following arguments may notnecessarily be given while calling connect()? (a) host (b) database (c) user (d) password	1

17.	Assertion (A):- If the arguments in function call statement match the number and order of arguments as defined in the function definition,such arguments are called positional arguments. Reasoning (R):- During a function call, the argument list first containsdefault argument(s) followed by positional argument(s).	1
18.	Assertion (A): CSV (Comma Separated Values) is a file format for datastorage which looks like a text file. Reason (R): The information is organized with one record on each lineand each field is separated by comma.	1

<div align="center">SECTION B</div>

19.	Rao has written a code to input a number and check whether it is prime or not. His code is having errors. Rewrite the correct code andunderline the corrections made.
	
	def prime():
	    n=int(input("Enter number to check :: ")for i in range (2, n//2):
	        if n%i=0:
	            print("Number is not prime \n")break
	        else:
	            print("Number is prime \n')
		2

20.	Write two points of difference between Circuit Switching and PacketSwitching. OR Write two points of difference between XML and HTML.	2

21.	(a) Given is a Python string declaration:
	        myexam="@@CBSE Examination 2022@@"
	
	        Write the output of: print(myexam[::-2])
	
	(b) Write the output of the code given below:
	        my_dict = {"name": "Aman", "age": 26}my_dict['age']
	        = 27 my_dict['address'] = "Delhi"
	        print(my_dict.items())
		1
		
		1

22.	Explain the use of 'Foreign Key' in a Relational Database Management System. Give example to support your answer.	2

23.	(a) Write the full forms of the following: (i) SMTP (ii) PPP (b) What is the use of TELNET?	2

24.	Predict the output of the Python code given below:
	
	``python
	def Diff(N1,N2):if
	    N1>N2:
	        return N1-N2else:
	        return N2-N1
	
	NUM= [10,23,14,54,32]
	for CNT in range (4,0,-1):
	    A=NUM[CNT]
	    B=NUM[CNT-1]
	    print(Diff(A,B),'#', end=' ')
	``
	
	 OR
	Predict the output of the Python code given below:
	
	``python
	tuple1 = (11, 22, 33, 44, 55 ,66)
	list1 =list(tuple1)new_list =
	[]
	for i in list1:if
	    i%2==0:
	        new_list.append(i)
	new_tuple = tuple(new_list)
	print(new_tuple)
	``
		2

25.	Differentiate between count() and count(*) functions in SQL withappropriate example. OR Categorize the following commands as DDL or DML:INSERT, UPDATE, ALTER, DROP	2

<div align="center">SECTION C</div>

26.	(a) Consider the following tables – Bank_Account and Branch: Table: Bank_Account 	ACode	Name	Type
A01	Amrita	Savings
A02	Parthodas	Current
A03	Miraben	Current		3

Table: Branch

ACode	City
A01	Delhi
A02	Mumbai
A01	Nagpur

What will be the output of the following statement?

SELECT * FROM Bank_Account NATURAL JOIN Branch;

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

Table: TECH_COURSE

CID	CNAME	FEES	STARTDATE	TID
C201	Animation and VFX	12000	2022-07-02	101
C202	CADD	15000	2021-11-15	NULL
C203	DCA	10000	2020-10-01	102
C204	DDTP	9000	2021-09-15	104
C205	Mobile Application Development	18000	2022-11-01	101
C206	Digital marketing	16000	2022-07-25	103

(i)   SELECT DISTINCT TID FROM TECH_COURSE;
(ii)   SELECT TID, COUNT(*), MIN(FEES) FROM TECH_COURSE GROUP BY TID HAVING COUNT(TID)>1;
(iii) SELECT CNAME FROM TECH_COURSE WHEREFEES>15000 ORDER BY CNAME;
(iv)   SELECT AVG(FEES) FROM TECH_COURSE WHERE FEES BETWEEN 15000 AND 17000;

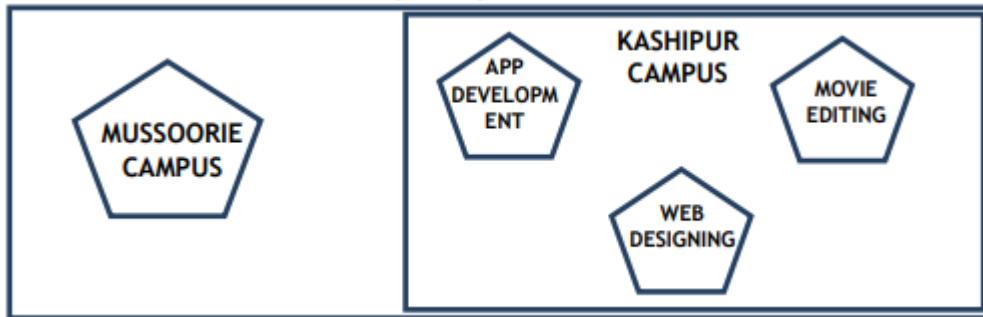|		
27	Write a method COUNTLINES() in Python to read lines from text file 'TESTFILE.TXT' and display the lines which are not starting with any vowel. Example: If the file content is as follows: An apple a day keeps the doctor away. We all pray for everyone's safety. A marked difference will come in our country. The COUNTLINES() function should display the output as: The number of lines not starting with any vowel - 1 OR	3

Write a function ETCount() in Python, which should read each character of a text file "TESTFILE.TXT" and then count and display the count of occurrence of alphabets E and T individually (including small cases e and t too).

Example:

If the file content is as follows:
Today is a pleasant day.
It might rain today.
It is mentioned on weather sites.

The ETCount() function should display the output as:
E or e: 6
T or t: 9

28	a) Write the outputs of the SQL queries (i) to (iv) based on the relations Teacher and Placement given below:	3

Table: Teacher

T_ID	Name	Age	Department	Date_of_join	Salary	Gende
1	Arunan	34	Computer	1/10/2019	12000	M
2	Saman	31	History	3/24/2017	20000	F
3	Randeep	32	Mathematics	12/12/2020	30000	M
4	Samira	35	History	7/1/2018	40000	F
5	Raman	42	Mathematics	9/5/2021	25000	M
6	Shyam	50	History	6/27/2019	30000	M
7	Shiv	44	Computer	2/25/2019	21000	M

Table: Placement

P_ID	Department	Place
1	History	Ahmedabad
2	Mathematics	Jaipur
3	Computer	Nagpu

(i)   SELECT Department, avg(salary) FROM Teacher GROUP BY Department;
(ii)   SELECT MAX(Date_of_Join),MIN(Date_of_Join) FROM Teacher;
(iii)   SELECT Name, Salary, T.Department, Place FROM Teacher T, Placement P WHERE T.Department = P.Department AND Salary>20000;
(iv)   SELECT Name, Place FROM Teacher T, Placement P 3 8 WHERE Gender ='F' AND T.Department=P.Department;

(b) Write the command to view all tables in a database.

29	Write a function INDEX_LIST(L), where L is the list of elements passed as argument to the function. The function returns another list named 'indexList' that stores the indices of all Non-Zero Elements of L.	3

	For example:	
	If L contains [12,4,0,11,0,56]	
	The indexList will have - [0,1,3,5]	

30	A list contains following record of a customer:
	 [Customer_name, Phone_number, City]
	
	 Write the following user defined functions to perform given operations on the stack named 'status':
	
	     (i) Push_element() - To Push an object containing name and Phone number of customers who live in Goa to the stack
	     (ii) Pop_element() - To Pop the objects from the stack and display them. Also, display "Stack Empty" when there are no elements in the stack.
	     For example: If the lists of customer details are:
	 ["Gurdas", "99999999999","Goa"]
	 ["Julee", "8888888888","Mumbai"]
	 ["Murugan","77777777777","Cochin"]
	 ["Ashmit", "1010101010","Goa"]
	
	     The stack should contain
	     ["Ashmit","1010101010"]
	     ["Gurdas","9999999999"]
	
	     The output should be:
	     ["Ashmit","1010101010"]
	     ["Gurdas","9999999999"]
	     Stack Empty
	
	 OR
	 Write a function in Python, Push(SItem) where , SItem is a dictionary containing the details of stationary items– {Sname:price}.
	 The function should push the names of those items in the stack who have price greater than 75. Also display the count of elements pushed into the stack.
	
	 For example:
	 If the dictionary contains the following data
	 Ditem={"Pen":106,"Pencil":59,"Notebook":80,"Eraser":25}
	
	 The stack should contain
	 Notebook
	 Pen
	
	 The output should be:
	 The count of elements in the stack is 2
		3

	SECTION D	
31	MakeInIndia Corporation, an Uttarakhand based IT training company, is planning to set up training centres in various cities in next 2 years. Their first campus is coming up in Kashipur district. At Kashipur campus, they are planning to have 3 different blocks for App development, Web designing and Movie editing. Each block has number of computers, which are required to be connected in a network	5

for communication, data and resource sharing. As a network consultant of this company, you have to suggest the best network related solutions for them for issues/problems raised in question nos. (i) to (v), keeping in mind the distances between various blocks/locations and other given parameters.

Distance between various blocks/locations:

Block	Distance
App development to Web designing	28 m
App development to Movie	55 m
Web designing to Movie editing	32 m
Kashipur Campus to Mussoorie Campus	232 km

Number of computers

Block	Number of Computers
App development	75
Web designing	50
Movie Editing	80

(i)   Suggest the most appropriate block/location to house the SERVER in the Kashipur campus (out of the 3 blocks) to get the best and effective connectivity. Justify your answer.

(ii)   Suggest a device/software to be installed in the Kashipur Campus to take care of data security.

(iii)   Suggest the best wired medium and draw the cable layout (Block to Block) to economically connect various blocks within the Kashipur Campus.

(iv)   Suggest the placement of the following devices with appropriate reasons: a. Switch / Hub b. Repeater

(v)   Suggest a protocol that shall be needed to provide Video Conferencing solution between Kashipur Campus and Mussoorie Campus.

| 32 | (a) Write the output of the code given below:<br><br>```
p=5
def sum(q,r=2):
    global p
    p=r+q**2
    print(p, end= '#')
``` | 5 |

```
a=10
b=5
sum(a,b)
sum(r=5,q=1)
```

(b) The code given below inserts the following record in the table Student:
      RollNo – integer
      Name – string
      Clas – integer
      Marks – integer

Note the following to establish connectivity between Python and MYSQL:
- Username is root
- Password is tiger
- The table exists in a MYSQL database named school.
- The details (RollNo, Name, Clas and Marks) are to be accepted from the user.

Write the following missing statements to complete the code:
Statement 1 – to form the cursor object
Statement 2 – to execute the command that inserts the record in the table Student.
Statement 3- to add the record permanently in the database

```
import mysql.connector as mysql
def sql_data():
    con1=mysql.connect(host="localhost",user="root", password="tiger",
database="school")
    mycursor=_____ #Statement 1
    rno=int(input("Enter Roll Number :: "))
    name=input("Enter name :: ")
    clas=int(input("Enter class :: "))
    marks=int(input("Enter Marks :: "))
    querry="insert into student
values({},'{}',{},{})".format(rno,name,clas,marks)
    _____ #Statement 2
    _____ # Statement 3
    print("Data Added successfully")
```

OR

(a) Predict the output of the code given below:
```
s="welcome2cs"
n = len(s) m=""
for i in range(0, n):
    if (s[i] >= 'a' and s[i] <= 'm'):
        m = m +s[i].upper()
    elif (s[i] >= 'n' and s[i] <= 'z'):
        m = m +s[i-1]
    elif (s[i].isupper()):
        m = m + s[i].lower()
    else: m = m +'&'
print(m)
```

	(b) The code given below reads the following record from the table named student and displays only those records who have marks greater than 75: RollNo – integer
	Name – string
	Clas – integer
	Marks – integer
	
	Note the following to establish connectivity between Python and MYSQL:
	Username is root
	Password is tiger
	The table exists in a MYSQL database named school.
	
	Write the following missing statements to complete the code:
	
	Statement 1 – to form the cursor object
	Statement 2 – to execute the query that extracts records of those students whose marks are greater than 75.
	Statement 3- to read the complete result of the query (records whose marks are greater than 75) into the object named data, from the table student in the database.
	
	``python
	import mysql.connector as mysql def sql_data():
	con1=mysql.connect(host="localhost",user="root", password="tiger", database="school")
	mycursor=_____ #Statement 1
	print("Students with marks greater than 75 are : ")
	_____ #Statement 2
	data=_____ #Statement 3
	for i in data:
	    print(i)
	print()
	``	

33	What is the advantage of using a csv file for permanent storage? Write a Program in Python that defines and calls the following user defined functions:
	   (i) ADD() – To accept and add data of an employee to a CSV file 'record.csv'. Each record consists of a list with field elements as empid, name and mobile to store employee id, employee name and employee salary respectively.
	   (ii) (ii) COUNTR() – To count the number of records present in the CSV file named 'record.csv'.
	
	 OR
	Give any one point of difference between a binary file and a csv file. Write a Program in Python that defines and calls the following user defined functions:
	   (i) add() – To accept and add data of an employee to a CSV file 'furdata.csv'. Each record consists of a list with field elements as fid, fname and fprice to store furniture id, furniture name and furniture price respectively.
	   (ii) (ii) search()- To display the records of the furniture whose price is more than 10000.
		5

| 34 | Navdeep creates a table RESULT with a set of records to maintain the marks secured by students in Sem 1, Sem2, Sem3 and their division. After creation of the table, he has entered data of 7 students in the table. | 4 |

ROLL_NO	SNAME	SEM 1	SEM 2	SEM 3	DIVISION
101	KARAN	366	410	402	I
102	NAMAN	300	350	325	I
102	NAMAN	300	350	325	I
103	ISHA	400	410	415	I
104	RENU	350	357	415	I
105	ARPIT	100	75	178	IV
106	SABINA	100	205	217	II
107	NEELAM	470	450	471	I

Based on the data given above answer the following questions:
- (i) Identify the most appropriate column, which can be considered as Primary key.
- (ii) If two columns are added and 2 rows are deleted from the table result, what will be the new degree and cardinality of the above table?
- (iii) Write the statements to: a. Insert the following record into the table Roll No- 108, Name- Aadit, Sem1- 470, Sem2-444, Sem3- 475, Div – I. b. Increase the SEM2 marks of the students by 3% whose name begins with 'N'.

OR (Option for part iii only)

(iii) Write the statements to:
a. Delete the record of students securing IV division.
b. Add a column REMARKS in the table with datatype as varchar with 50 characters.

| 35 | Aman is a Python programmer. He has written a code and created a binary file record.dat with employeeid, ename and salary. The file contains 10 records. He now has to update a record based on the employee id entered by the user and update the salary. The updated record is then to be written in the file temp.dat. The records which are not to be updated also have to be written to the file temp.dat. If the employee id is not found, an appropriate message should to be displayed.

As a Python expert, help him to complete the following code based on the requirement given above: | 4 |

```
import _____ #Statement 1
def update_data():
    rec={} fin=open("record.dat","rb")
    fout=open("_____") #Statement 2
    found=False
    eid=int(input("Enter employee id to update their salary :: "))
    while True:
        try: rec=_____ #Statement 3
            if rec["Employee id"]==eid:
```

```python
                    found=True
                    rec["Salary"]=int(input("Enter new salary :: "))
                    pickle._____ #Statement 4
                else:
                    pickle.dump(rec,fout)
        except: break

    if found==True:
        print("The salary of employee id ",eid," has been updated.")
    else: print("No employee with such id is not found")
        fin.close()
    fout.close()
```

(i) Which module should be imported in the program? (Statement 1)

(ii) Write the correct statement required to open a temporary file named temp.dat. (Statement 2)

(iii) Which statement should Aman fill in Statement 3 to read the data from the binary file, record.dat and in Statement 4 to write the updated data in the file, temp.dat?