

KENDRIYA VIDYALAYA SANGATHAN*
(AGRA REGION)
SESSION ENDING EXAMINATION 2018-19
CLASS – XI
SUBJECT - COMPUTER SCIENCE
(SOLVED PAPER)

**Note:- This Paper is solely for reference purpose only. The format has now been modified by CBSE for March 2020 examination.*

Time: 3 Hrs.

M.M.: 70

General Instructions:

- (i) Please check that question paper contains 07 printed pages.
- (ii) Code number given on the right hand side of the question paper should be written on the title page of the answer-book by the candidate.
- (iii) Please check that this question paper contains 7 questions.
- (iv) Please write down the Serial Number of the question before attempting it.
- (v) 15 minutes time has been allotted initially to read this question paper. The students will read the question paper only and will not write any answer on the answer during this period.

Instructions:

- (i) Programming Language: Python.
- (ii) All Questions are compulsory within each section.

1. (a) What is a difference between interactive mode & script mode in Python? 2
(b) "Variables In Python do not have fixed locations". Elaborate. 1
(c) Identify Mutable & Immutable type from the following: 1
Integer, string, tuple, list
(d) What is the length of the tuple T shown below? 1
 $T = (((('a', 1), 'b', 'c'), 'd', 2), 'e', 3)$
(e) What are the main error types? Which types of error are most dangerous and why? 1
(f) How are keyword different from Identifiers? Explain with examples? 1
(g) Write the most appropriate list method (name of the function) to perform the following task : 1
(i) Delete a given element from the list.
(ii) Add elements of a list in the end of a list.
(iii) Delete 3rd element from the list.
Suggest appropriate String functions for the following tasks:
(iv) To find for the occurrence of a string within another string.
(v) To check whether the string contains digits.
(vi) To check whether all letters of the string are in capital letter.
2. (a) Write a program to create a phone dictionary for all your friends and then print it. 2
(b) Rewrite the following code fragment using for loop: 2

```
i=100
while (i > 0) :
    print (i)
    i=i-3
```


(c) Write a program to calculate BMI of a person after inputting Its weight In Kilograms and height In meters and then print the Nutritional Status as per following table: (Hint: $BMI = \text{Weight}/(\text{Height})^2$) 2

Nutritional Status	WHO criteria BMI cut-off
Underweight	<18.5
Normal	18.5-24.9
Overweight	25-29.9
Obese	≥ 30

- (d) (i) Write a program to print a pattern like: 2

```
4 3 2 1
4 3 2
4 3
4
```

- (ii) Write a short program to print the following series: 1
 1, 4, 7, 10, ... ,40
3. (a) Predict the output of the following fragment: 2

```

if x>3:x-1
If x>4:
    print ("A", end = ' ')
else:
    print("B", end= ' ')
elif x<2:
    If (x!=0):
        printf("C", end = ' ')
        print("D")
  
```
- (b) Find the syntactical errors In following code. Underline the erroneous part and write corrected code: 2

```

if n ==0
    print ("zero")
elif: n==1
    print("one")
ellf
    n==2:
        print("two")
else n==3:
    prifnt(three)
  
```
- (c) Write a program to search for an element in a given list of numbers. 3
- (d) Write a program that reads a line & print its statistics like: 4
 Number of uppercase letters
 Number of lowercase letters
 Number of alphabets
 Number of digits
- (e) Write a program to sort a list using bubble sort. 4
Example:
 Original list is [15, 6, 13, 22, 3, 52, 2]
 List after sorting [2, 3, 6, 13, 15, 22, 52] 2
- 4 (a) Name the law shown below & verify It using truth table: 2

$$A + B.C = (A+B). (A+C)$$
 OR
 State and prove DeMorgan's Theorem algebraically.
- (b) Draw logic circuit diagram for the following expression: 2

$$Y = ab + b'c + c'a'$$
- (c) Convert the following : 2
 (i) $(43)_{10} = (?)_2$
 (ii) $(1010111010)_2 = (?)_{16}$
- (d) Differentiate between system software and application software. 2
- (e) What is cloud computing ? 1
- (f) What is the role of operating system as a resource manager ? 1
5. (a) What are the advantages provided by database system ? 2
 (b) Differentiate between DDL and DML commands ? 2
 (c) What are NoSQL Databases ? 1
6. Write MySQL command to create the Table 'LIBRARY' with given 4
 (a) constraints.

Table : LIBRARY

COLUMN_NAME	DATATYPE (SIZE)	CONSTRAINT
BookId	Int(10)	Primary Key
BookName	Varchar(40)	Not Null
Type	Char(4)	
Author	Varchar(40)	
No_Copies	Int(6)	
Price	Decimal(8,2)	

- (b) In a Database - SAMS and VENDOR are two tables with the following information.

2

Table : SAMS

ICode	IName	Price	Colour	VCode
S001	Refrigerator	20000	Blue	P01
S002	Mobile Phone	45000	Black	P02
S003	LCD	60000	Silver	P03
S004	Washing Machine	12500	Smoke	P01
S005	Air Conditioner	16000	White	P03

Table : VENDOR

VCode	VName
P01	Satish
P02	Manoj
P03	Subodh
P04	Jacob

- With reference to SAMS table, which column should be set as the Primary key? Which column is the foreign key? Give reasons.
 - To display ICodd, IName and VName of all the vendors, who manufacture 'Refrigerator.'
- (c) Consider the following table named "SOFTDRINK". Write commands of SQL for (i) to (iv) and output for (v) to (vi).

6

Table : SOFTDRINK

DRINKCODE	DNAME	PRICE	CALORIES
101	Lime and Lemon	20.00	120
102	Apple Drink	18.00	120
103	Nature Nectar	15.00	115
104	Green Mango	15.00	140
105	Aam Panna	20.00	135
106	Mango Juice Bahaar	12.00	150

- To display names and drink codes of those drinks that have more than 120 calories.
 - To display drink codes, names and calories of all drinks, In descending order of calories.
 - To display names and price of drinks that have price in the range 12 to 18 (both 12 and 18 included).
 - Increase the price of all drinks in the given table by 10%.
 - SELECT COUNT(DISTINCT(PRICE)) FROM SOFTDRINK;
 - SELECT DNAME FROM SOFTDRINK WHERE DNAME LIKE
7. (a) What measures should one take to avoid and maintain confidentiality of personal information? 2
- (b) Rahul wanted to gift his friend a football or wrist. So he searched for many sports items and wrist watches online. But after that every time he goes online, his web browser shows him advertisement about sports items and wrist watches.
- Why is this happening
 - How could have Rahul avoided them ?
- (c) Explain about Worms and Trojan Horses. 2
- (d) Write some ways to protect our system against viruses, Adware and Spyware? 2
- (e) What do you understand by Identity theft? 1
- (f) What do you understand by Firewall? 1

■ ■

SOLUTIONS

1. (a) In interactive mode, instructions are given in front of Python prompt (>>>) of Python shell. Python carries out the given instruction and shows the result there itself.
In script mode, Python instructions are stored in a file generally with .py extension and are executed together in one go as a unit. The saved instructions are known as Python script or Python program.
- (b) Variables in Python do not need declaration to reserve memory space or fixed locations. The variable declaration happens automatically when we assign a value to a variable.
- (c) Mutable type : list
Immutable type : integer, string, tuple
- (d) The length of this tuple is 3.
- (e) There are broadly three types of errors :
Compile time errors, run time errors and logical errors.
Run time errors are most dangerous because these are harder to detect.
- (f) Keyword is a special word that are reserved. e.g. if, elif, else etc.
Identifier is a user defined name that are not reserved. e.g. Num, add2 etc.
- (g) (i) remove() method
(ii) list.extend(list2) method
(iii) pop()
(iv) string.count()
(v) isdigit()
(vi) isupper()
2. (a)

```
phonebook = {"Abhi" : 54530042, "Vanshika" : 63407543, "Aman" : 75007643, "Khushi" : 79450345}
for name, number in phonebook.items():
    print("Phone number of %s is %d" %(name, number))
```
- (b) Rewrite the code using for loop:

```
for i in range(100, 0, -3):
    print i
```
- (c)

```
def BMI():
    Height = float(input("Enter height in meters: "))
    Weight = float(input("Enter weight in kg: "))
    bmi = weight/(height**2)
    return bmi
bmi = BMI(Height, weight)
print("The BMI is", format(bmi), "so", end="")
if(bmi < 18.5):
    print("Underweight")
elif(bmi >= 18.5 and bmi < 24.9):
    print("Normal")
elif(bmi >= 25 and bmi < 29.9):
    print("Overweight")
elif(bmi >= 30):
    print("Obese")
```
- (d) (i)

```
def numpat(n):
    num = n
    for i in range(n, 0):
        num = n
        for j in range(i + 1, 0):
            print(num, end=" ")
        num = num - 1
    print("\r")
```
- (ii)

```
def series():
    for i in range 40:
        if(i%3 == 1):
            print i
    return 0
```
3. (a) output
C D
- (b) Correct code

```
if (n == 0):
    print("Zero")
elif (n == 1):
    print("one")
elif (n == 2):
    print("two")
else (n == 3):
    print("three")
```
- (c)

```
def search(ar, item):
    i = 0
    while i < len(ar) and ar[i] != item:
        i = i + 1
    if i < len(ar):
        return i
    else:
        return False
item = int(input("\n Enter element to be searched for ..."))
index = search(ar, item)
if index:
    print "Element found at index:", index
else:
    print "\n sorry!! Entered element could not found"
```
- (d)

```
string = input("Please Enter your string:")
alphabets = digits = uppercase = lowercase = special = 0
for i in range(len(string)):
    if(string[i].isalpha()):
        alphabets = alphabets + 1
    elif(string[i].isdigit()):
        digits = digits + 1
    elif(string[i].islower()):
        lowercase = lowercase + 1
    elif(string[i].isupper()):
        uppercase = uppercase + 1
    else:
        special = special + 1
print("\n Total no. of alphabets:", alphabets)
print("\n Total no. of digits:", digits)
print("\n Total no. of lowercase:", lowercase)
print("\n Total no. of uppercase:", uppercase)
```
- (e)

```
def bubble sort (a list):
    for passnum in range (len(alist)-1,0,1):
        for i in range (passnum):
            if alist[i] > alist[i+1]:
                temp = alist[i]
                alist[i] = alist[i+1]
                alist[i+1] = temp
        alist = [15,6,13,22,3,52,2]
        bubblesort (alist)
    print (alist)
```

4. (a) $A + B.C = (A + B).(A + C)$ shows a distributive law.
Truth table for $A + B.C = (A + B).(A + C)$

A	B	C	B.C	A + B	A + C	A + B.C	(A + B).(A + C)
0	0	0	0	0	0	0	0
0	0	1	0	0	1	0	0
0	1	0	0	1	0	0	0
0	1	1	1	1	1	1	1
1	0	0	0	1	1	1	1
1	0	1	0	1	1	1	1
1	1	0	0	1	1	1	1
1	1	1	1	1	1	1	1

Both columns $A + B.C$ and $(A + B).(A + C)$ are identical. Hence proved

OR

DeMorgan's theorems are extremely useful in simplifying expressions in which a product or sum of variables is inverted. The two DeMorgan's theorems are:

(i) $\overline{A \cdot B} = \overline{A} + \overline{B}$

(ii) $\overline{A + B} = \overline{A} \cdot \overline{B}$

$\overline{A \cdot B} = \overline{A} + \overline{B}$ theorem expressed as the complement of a product is equal to sum of complement, i.e. complement of two or more variables used in AND gate is same as the OR of the complement of each individual variable.

We know that $\overline{A + B}$ the complement of $A \cdot B$ so

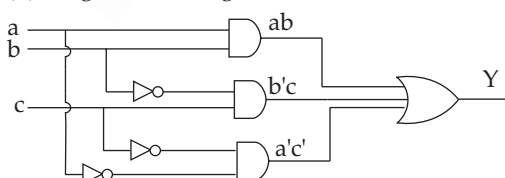
(i) $\overline{A \cdot B + (A + B)} = 1$ and

(ii) $\overline{A \cdot B \cdot (A + B)} = 0$

(i) L.H.S = $\overline{A \cdot B + (A + B)}$
 $= \overline{(A + \overline{B} + A) \cdot (\overline{A} + \overline{B} + B)}$
 $= \overline{(A + A + \overline{B}) \cdot (\overline{A} + B + \overline{B})}$
 $= \overline{(1 + \overline{B}) \cdot (\overline{A} + 1)}$
 $= \overline{1 \cdot 1} = \overline{1} = 0$ R.H.S

(ii) L.H.S = $\overline{A \cdot B \cdot (A + B)}$
 $= \overline{A \cdot B \cdot A + A \cdot B \cdot \overline{B}}$
 $= \overline{A \cdot A \cdot B + A \cdot B \cdot \overline{B}}$
 $= \overline{0 \cdot B + A \cdot 0}$
 $= \overline{0 + 0} = \overline{0} = 1$ R.H.S

- (b) logic circuit diagram for $Y = ab + b'c + c'a'$



(c) (i) $(43)_{10} = (?)_2$

2	43	1	MSB
2	21	1	
2	10	0	
2	5	1	
2	2	0	
2	1	1	LSB
0			

$(43)_{10} = (101011)_2$

(ii) $(1010111010)_2 = (?)_{16}$

0010	1011	1010
↓	↓	↓
2	11 → B	10 → A

So, $(1010111010)_2 = (2BA)_{16}$

- (d) Difference between system software and application software are as follows:

System software	Application software
(i) It enables the computer to function properly.	(i) It enables user to work efficiently with documentation such as letters.
(ii) It provides the environment in which the application run.	(ii) It provides the environment to enable users to accomplish specific tasks.

- (e) Cloud computing provides computing and storage capacity services to heterogeneous community of end recipients. The name comes from the use of clouds as an abstraction for the complex infrastructure it contains in system diagrams.

It entrusts services with a user's data, software and computation over a network. It has considerable overlap with software as a service (SaaS).

- (f) Operating system is known as resource manager because it controls all the activities of computer system and acts as an interface between user and hardware. Alternatively, operating system provides an orderly and controlled allocation of the processors, memories and I/O devices.

5. (a) Advantages provided by database system are
- Data sharing** The data stored in the database can be shared among multiple users or application programs.
 - Elimination of inconsistency** Various copies of the same data may no longer be same. It causes mis-matching of data and this mis-matching known as data inconsistency. Database controls data inconsistency.
 - Provide backup and recovery** The database system provides the most vital feature known as backup and recovery.
- (b) Differences between DDL and DML commands:

DDL	DML
(i) DDL stands for Data Definition Language.	(i) DML stands for Data Manipulation Language.
(ii) It provides statements for creation and deletion of the database tables, views etc.	(ii) It provides statements for manipulating the database objects.
(iii) DDL statements are CREATE, ALTER, DROP, RENAME	(iii) DML statements are SELECT, INSERT, UPDATE, DELETE.

- (c) NOSQL is an approach to database design that can accommodate a wide variety of data models, including key-value, document, columnar and graph formats. NOSQL databases are especially useful for working with large sets of distributed data. Traditional RDBMS uses SQL syntax to store and retrieve data for further insights. Instead, a NOSQL database system encompasses a wide range of database technologies that can store structured, semi-structured, unstructured and polymorphic data.

6. (a) CREATE TABLE LIBRARY
(
BookId Int(10) Primary key,
BookName varchar(40) Not Null,
Type char(4),
Author varchar(40),
No-copies Int(6),
Price Decimal(8,2)
);
- (b) (i) In SAMS table, Icode is primary key and Vcode is foreign key. Primary key uniquely identifies each record in a table, So we set Icode as primary key. Foreign key whose value is derived from the primary key of another table so we set Vcode as foreign key because it is derived from VENDOR table.
- (iii) SELECT Icode, IName, VName From SAMS S, VENDOR V WHERE S.Vcode = V.Vcode AND IName = "Refrigerator";

- (c) (i) SELECT DNAME, DRINKCODE From SOFTDRINK WHERE CALORIES > 120;
- (ii) SELECT DRINKCODE, DNAME, CALORIES From SOFTDRINK ORDER By CALORIES DESC;
- (iii) SELECT DNAME, PRICE From SOFTDRINK WHERE PRICE BETWEEN 12 AND 18;
- (iv) UPDATE SOFTDRINK SET PRICE = PRICE + 0.1;
- (v)

COUNT(DISTINCT(PRICE))
4
- (vi)

DNAME
NULL

7. (a) There is various ways to avoid and maintain confidentiality of personal information. These are as following :

- Don't share your password and Id's to others.
 - When you make payment online once ensure authenticity of website.
 - Don't share your OTP(One Time Password)
 - Don't set the same password for all your Ids.
 - Never click an attachment or links which are unknown to you.
- (b) (i) This is happening because of virus.
- (ii) Rahul could have avoided them by installing antivirus. Antivirus is an application program which prevents and detects the virus.
- (c) Computer worm It is stand alone malware computer program that replicates itself in order to spread to other computers. Trojan Horse It is a non self replicating type of malware which appears to perform a desirable function but instead facilitates unauthorised access to the user's computer system.
- (d) Some ways to protect our system against viruses, adware and spyware are
- Antivirus and anti-spyware programs require regular signature and database updates.
 - Install antivirus in your system.
 - Don't click an e-mail links or attachments.
 - Use a hardware based or software based firewall.
- (e) Identity theft is the crime of obtaining the personal or financial information of another person for the sole purpose of assuming that person's name or identity to make transactions or purchases.
- (f) A firewall is a part of a computer system or network that is designed to block unauthorised access while permitting authorised communication.

