## Sample paper 3

Name: $\qquad$
Max. Time: $\mathbf{3} \mathbf{h r}$ Instructions:
M.M:70

No. of pages: 8

1. Attempt all the questions neatly.
2. Marks are indicated against each question.

Q-1.
(a) What is the difference between public and private datamembers of a class ?
(b)Write the names of the files which are necessary to execute the following python code def main 1 (string):
for $i$ in range(10):
if String.isalnum():
print "end"
else:
c=String.toupper()
print math.pow $(3,4)$
print c
(c)Rewrite the following program after removing the syntactical error(s),if any .Under line each correction .
print emp[name]
emp=\{"physics":"ms nimmy"; "che":"mr. gourav";"maths":"mr.amit"\}
main1 (emp_no)
(d) Find the output of the following program
def main1()
Text = "Mind@Work!";
for i in range (len(Text)):

$$
\begin{gathered}
\text { if Text[i].isalpha( ): } \\
\text { str[i]+= '*' } \\
\text { elif Text[[i].isupper( ): }
\end{gathered}
$$

```
                        str[i]+=Text[i]+1;
    else:
    str[i]=Text[i+1];
print str
main1()
(e) Give the output of the following program
global = 10
def func(x, y=20):
\[
\begin{aligned}
& x=x-y ; y=x * 10 ; \\
& \text { print "x <<" }, x, " \ll y "
\end{aligned}
\]
\(x=30\)
func(global)
print "global<<", global," \(x \ll ", x\)
func(global, x);
print "global<<",global," \(x \ll ", x\)
(f). Find the correct possible output(s) Import random
def main1():
city=\{"PKD", "EKM", "TVM", "KOL", "CAL"\};
for i in range (3):
z=rand.randint(2)+1; print city[Z],"@",
main1()
(i) PKD@ EKM @TVM@
(ii) EKM @TVM@ EKM @
(iii) TVM@KOL@CAL@
(iv) TVM@ EKM @TVM@
```


## Q-2.

(a).What do you mean by a __str__( ) of a class ? What is its use?
(b)Answer the questions(i) and(ii) after going through the following class: class School:

```
        score=0
```

        def __init__(self, \(y, v\) ):
    (i) Create an object, such that it invokes Constructor 1.
(ii)Write complete definition for function 1 which reads the value of score.
(c) Define a class Product with the following specifications.
[4]
Product_NO integer type
Product_TITLE 20 Characters
PRICE
float (price per copy)
TOTALCOST() A function to calculate the total cost for N number of products,
Where N is passed to the function as argument
Read() Function to read Product _NO, Product _TITLE, PRICE
PURCHASE() Function to ask the user to input the number of copies to be purchased. It invokes TOTALCOST() and prints the total cost to be paid by the user.
Note: You are also required to give detailed function definitions.
(d) Answer the questions ito iv based on the following code class book:

Title=" "
Author="sumita arora"
no-of_pages=100
def read(self):
---------- read data
def show(self):
--------- show data
class Practicalbook(book):
no_of_chapters=10
no_of_assignments=20
standard=9
def readtextbook(self): ---------- read data
def showtextbook(self):
--------- show data
class Notebook(Practicalbook):
Topic=" "
def readphysicsbook(self): ---------- read data
def showphysicsbook(self):
--------- show data
(i) Name the data members, which can be accessed from the member functions of class Notebook.
(ii) Name the members, which can be accessed by an object of class Practicalbook.
(iii) Name the methods, which can be accessed by an object of class Notebook.
(iv) Name the type of inheritance used in the above code.

Q-3.
[18]
(a) Write a function Get1from2() function in python to transfer the content from two list First[ ] and Second[ ] to list AII[ ]. The even places ( $0,2,4 \ldots .$. ) of list All[ ] should get the contents from the array First[ ] and odd places (1,3,5...) of the list All[ ] should get the contents from the list Second[ ]

Eg: If the First [ ] list contains 30, 60,90,
And the Second [ ] list contains10, 50,80,
Then All [ ] list should contain 30, 10, 60,50,90,80.
(b) What do you mean by operator overloading? Explain with the coding in python.
(c) Write a function in python to insert and delete an element into a dynamically allocated queue where each queue item contains a name (of type string) as data.
(d) Write a function in python which accepts a 2D array of integers and its size as arguments and displays the elements which lie on diagonals.
[Assuming the 2D array to be square matrix with odd dimension i.e. $3 * 3,5 * 5,7 * 7$ etc....]
Eg: 543
678
129
Output through the function should be:
Diagonal one : 579
Diagonal two : 371
(e) Evaluate the following postfix notation of expression: 20,6,+,20,4,-,+
f) What will be the status of following list after third pass of bubble sort and third pass of selection sort used for arranging elements in ascending order?
20, 47, -23, -11, 27, 38, -61.selec
g) Write a python function to search for a value in the given list using binary search method. Function should receive the list and value to be searched as argument and return 1 if the value is found 0 otherwise.

## Q-4.

(a).What is the difference between readline( ) and readlines( ) functions?
(b) Write a function in python to print the count of the word as an independent word in a text file story.txt
Eg: There was a tiger in the zoo. The tiger was very naughty.
The output of the program should be 2.
(c) Given a binary file Sports.dat, containing records of the following class type:
class Sports:

```
Event=" "
Participant=" "
def __init__(self,e,p):
    self.Event=e
    self.Participant=p
def read_data(self):
    self.Event=raw_input("enter the event")
    self.Participant= raw_input("enter the participant name")
def show_data(self):
    print "event name is",self.Event
    print "participant name is:", self.Participant
```

Write a function in python that would read contents from the file Sports .dat and creates a file named Athletic.dat copying only those records from Sports.dat where the event name is "Atheletics".

## Q-5.

[8]
(a) What do you understand by the term cardinality and degree of a relation in a relational database?
(b) Write SQL commands for the queries (i) to (iv) and output for (v) \& (viii) based on a table COMPANY and CUSTOMER

| COMPANY |  |  |  |
| :---: | :---: | :---: | :---: |
| 111 | SONY | DELHI | TV |
| 222 | NOKIA | MUMBAI | MOBILE |
| 333 | ONIDA | DELHI | TV |
| 444 | SONY | MUMBAI | MOBILE |
| 555 | BLACKBERRY | MADRAS | MOBILE |
| 666 | DELL | DELHI | LAPTOP |

## CUSTOMER

| CUSTID | NAME | PRICE | QTY | CID |
| :---: | :--- | :---: | :---: | :---: |
| 101 | Rohan Sharma | 70000 | 20 | 222 |
| 102 | Deepak Kumar | 50000 | 10 | 666 |
| 103 | Mohan Kumar | 30000 | 5 | 111 |
| 104 | Sahil Bansal | 35000 | 3 | 333 |
| 105 | Neha Soni | 25000 | 7 | 444 |
| 106 | Sonal Aggarwal | 20000 | 5 | 333 |
| 107 | Arjun Singh | 50000 | 15 | 666 |

(i) To display those company name which are having price less than 30000 .
(ii) To display the name of the companies in reverse alphabetical order.
(iii) To increase the price by 1000 for those customer whose name starts with ' S '
(iv) To add one more column totalprice with decimal $(10,2)$ to the table customer
(v) SELECT COUNT(*) ,CITY FROM COMPANY GROUP BY CITY;
(vi) SELECT MIN(PRICE), MAX(PRICE) FROM CUSTOMER WHERE QTY>10;
(vii) SELECT AVG(QTY) FROM CUSTOMER WHERE NAME LIKE "\%r\%;
(viii) SELECT PRODUCTNAME,CITY, PRICE FROM COMPANY,CUSTOMER

WHERE COMPANY.CID=CUSTOMER.CID AND PRODUCTNAME="MOBILE";

Q6.
a) State and define principle of Duality. Why is it so important in Boolean Algebra?
b) Draw the logical circuits for the following using NOR gates:
$F(a, b, c, d)=\sum 0,3,4,7$
c) Write Product Of Sum expression of the function F ( $a, b, c, d$ ) from the given truth table [1]

| a | b | c | d | F |
| :--- | :--- | :--- | :--- | :--- |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 |
| 0 | 0 | 1 | 0 | 1 |
| 0 | 0 | 1 | 1 | 1 |
| 0 | 1 | 0 | 0 | 0 |
| 0 | 1 | 0 | 1 | 1 |
| 0 | 1 | 1 | 0 | 1 |
| 0 | 1 | 1 | 1 | 0 |
| 1 | 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 1 | 0 |
| 1 | 0 | 1 | 0 | 1 |
| 1 |  | 0 | 1 | 1 |
| 1 | 1 | 0 | 0 | 1 |
| 1 | 1 | 0 | 1 | 0 |
| 1 | 1 | 1 | 0 | 0 |
| 1 | 1 | 1 | 1 | 1 |
|  |  |  |  |  |

d) Obtain the minimal POS form for the following boolean expression using K- Map. $\mathrm{F}(\mathrm{w}, \mathrm{x}, \mathrm{y}, \mathrm{z})=\Pi(0,2,3,5,7,8,10,11,13,15)$

Q7.
a.Expand the terms: HTTP and CDMA
b. Indian School, in Mumbai is starting up the network between its different wings. There are Four Buildings named as SENIOR, JUNIOR, ADMIN and HOSTEL as shown below.:

| SENIOR | JUNIOR |
| :--- | :--- |

The distance between various buildings is as follows:
ADMIN TO SENIOR
200 m

| ADMIN TO JUNIOR | 150 m |
| :--- | ---: |
| ADMIN TO HOSTEL | 50 m |
| SENIOR TO JUNIOR | 250 m |
| SENIOR TO HOSTEL | 350 m |
| JUNIOR TO HOSTEL | 350 m |


| Number of Computers in Each Building |  |
| :---: | ---: |
| SENIOR | 130 |
| JUNIOR | 80 |
| ADMIN | 160 |
| HOSTEL | 50 |

(b1) Suggest the cable layout of connections between the buildings.
(b2) Suggest the most suitable place (i.e. building) to house the server of this
School, provide a suitable reason.
(b3) Suggest the placement of the following devices with justification. Repeater
Hub / Switch
(b4) The organization also has Inquiry office in another city about $50-60 \mathrm{Km}$ away in Hilly Region. Suggest the suitable transmission media to interconnect to school and Inquiry office out of the following .

```
Fiber Optic Cable
Microwave
Radio Wave
```

e. What is the difference between packet \& message switching?
f. Define firewall.
g. Which protocol is used to creating a connection with a remote machine?


Name: $\qquad$

## Max. Time: $\mathbf{3} \mathbf{h r}$ <br> Sub:Computer Science (083) No. of pages: 2 <br> Set-1

Q-1.
(a) public datamembers can be accesed from anywhere by the objects of class.
(b)
import math = "ram"
(c) two errors
[1]
(d) ${ }^{*} \mathrm{NB}^{*} \mid \mathrm{S}^{*}$
(e) global 30
(f) iii
[2]
[2]

## Q-2.

(a).str is used to convert the object into a string
(b)
(i) $\mathrm{s}=$ School(4)
(ii) complete definition for the School_data( ) function.
[1].
(d) Defining a class
[1]
Defining Private attributes
Defining Methods in a class
[3]
TOTAL_COST()
Read()
PURCHASE()
(e) (i) Physicsbook. no_of_chapters, no_of_assignments, Title, Author
(ii) base class BOOK and derived class Physics Book
(iii) the $\qquad$ init () function definition for the class Physicsbook().
iv) Multilevel Inheritance.

## Q-3.

(a) def of Getfrom2( )

A suitable python logic
[1]
(b) operator overloading
python example
(c) Insertion in Queue

Deletion in Queue
(d)

Two for loops
Condition to show diagonal elements
e) 34
[2]
f) bubble sort
selection sort
g) definition of function logic of binary search
Q-4.
[1]
(a) Readline is used to read the data line by line

Readlines is used to convert each line into list items
(b) Creation of def logic Formatted output
(c) Creation of data file Logic Syntax
[.5]
[1]
[.5]

Q-5
a) cardinality means no of rows in a relation while degree is the no. of columns in a relation.
b) I) select * from company where price $<30000$
2) select name from company order by name desc
3. set price=price+1000 where name='s'
4. update company

Q-6 a) principal of duality
[1] its use
[1]
b. logical circuit using NOR gate
[2]
c. $F(a, b, c, d)=\left(a+b+c^{\prime}\right)\left(a+b^{\prime}+c\right)$
d. $F(w, x, y, z)=(w+x+y)\left(w^{\prime}+x\right)\left(x+y^{\prime}\right)$

Q-7
a) HTTP: hyper text transfer protocol CDMA: code division multiple access
b)bus topology
c) admin
d)repeater is used between bocks while hub is used inside the buildings.
e)Fibre optical cable
f) firewall is the set of security process to keep safe the network.
g)Telnet

X-----------------------------------------------------------------------------------------------------

