KENDRIYA VIDYALAYA SANGATHAN, MUMBAI REGION
1st Pre-Board Examination 2019-20

Class : 12th   **Subject : Informatics Practices (IP)**

Time : 03 hrs   **Max. Mark : 70**

General Instructions:
- *All questions are compulsory*
- *Question Paper is divided into 4 sections A,B,C and D.*
- *Section A comprises of questions(1 and 2)*
  (i) Question 1 comprises Data Handling-2(DH-2)(Series, Numpy)
  (ii) Question 2 comprises of question from Data Handling -2(DH-2)(Data Frames and its operations)
- *Section B comprises of questions from Basic Software Engineering.*
- *Section C comprises of questions from Data Management-2(DM-2)*
- *Section C comprises of questions from Society, Law and Ethics-2(SLE-2)*

SECTION -A

1 (a) Find the output of following program :   1

```
import numpy as np
d=np.array([10,20,30,40,50,60,70])
print(d[-1:-4:-1])
```

(b) Fill in the blank with appropriate numpy method to calculate and print the variance of an array.   1

```
import numpy as np
data=np.array([1,2,3,4,5,6])
print(np.____(data,ddof=0))
```

(c) Mr. Kamlesh wants to plot a Bar Graph for the given set of values of months on x-axis and number of participants who attended workshop in particular month on y-axis.
Complete the code to perform the following :
(i) To plot the bar graph in *statement 1*   ½
(ii) To add label for x-axis as "No. of Students attended" in graph in *statement 2*   ½

```
import matplotlib.pyplot as plt
x=['JAN', 'FEB', 'MAR', 'APR','MAY','JUN']
y=[30,20,30,50,10,60]
_____ Statement 1
_____ Statement 2
```

OR

Ms. Shalu wants to plot a Line Chart for the given set of values of months on x-axis and number of participants who attended workshop in particular month on y-axis. Complete the code to perform the following :

(i) To plot the Line Chart in *statement 1*

(ii) To add Title as "Status of Workshop" in graph in *statement 2*

```
import matplotlib.pyplot as plt
x=['JAN', 'FEB', 'MAR', 'APR','MAY','JUN']
y=[30,20,30,50,10,60]
_____ Statement 1
_____ Statement 2
```
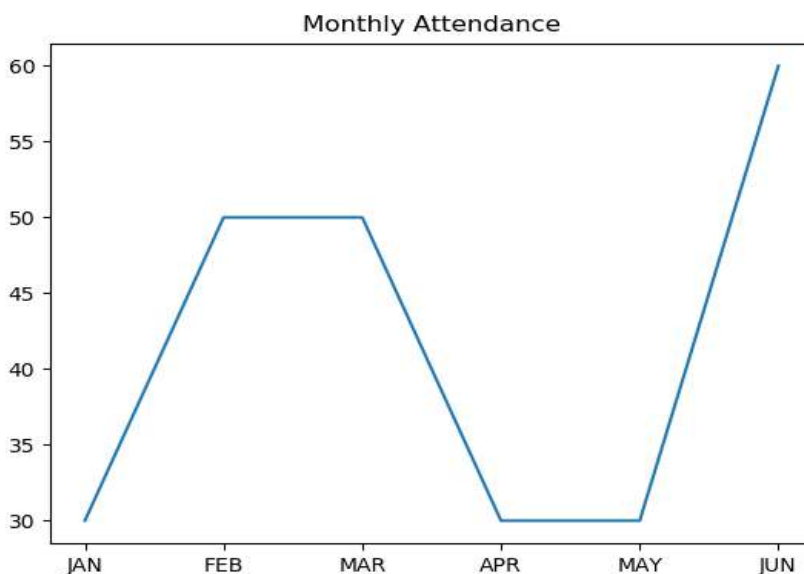
(d) Write the output of the following code :   2
```
import numpy as np
a=[[1,2,3,4],[5,6,7,8]]
b=[[1,2,3,4],[5,6,7,8]]
n=np.concatenate((a, b), axis=0)
print(n[1])
print(n[1][1])
```

(e) Write a code to plot the Monthly Attendance of students in class as shown in the figure given below: 2

(f) What is series? Explain with the help of an example.   2

(g) Write a NumPy program to create a 3x3 identity matrix, i.e. diagonal elements are 0, the rest are 1.   3

OR

Write a NumPy program to create a 3x3 identity matrix, where all elements are 2.

2.(a) _____method is used to rename any index, column or row of a Series or Dataframe : 1

    (i) rename()

    (ii) reindex()

    (iii) reframe()

    (iv) none of the above

(b) Suman wants to display the first 5 rows of the dataframe df. Which function she has to use ? 1

OR

Write the command to read data from data.csv file to create dataframe.

(c) Consider the following python code and write the output : 1

```
import pandas as pd
K=pd.Series([2,4,6,8,10])
s = pd.Series(K)
print (s)
```

(d) Write a small python code to insert a row in following dataframe df at location 2. 1

```
      Rl    Name       Age
0     1     Seema      33
1     2     Sunil      44
```

(e) What is Pivoting? Name any two functions of Pandas which support pivoting. 2

(f) Write python code to create following dataframe : 2

```
      Subject    Teacher    School
0     Phy        10         KV
1     Chem       5          JNV
2     Math       8          JNV
3     CS         12         KV
```

OR

Write a small python code to create a dataframe with headings('Rollno' and 'Name') using the list given below :

```
[[1,'Shayam'],[2,'Mohan'],[3,'Kamla'],[4,'Kamalesh']]
```

(g) Consider the following dataframe, and answer the questions given below: 3

```
df = pd.DataFrame({'Phy':[20, 40, 50, 44, 30],
                   'Chem':[58, 25, 54, 30, 29],
                   'Math':[20, 16, 70, 36, 82],
                   'IP':[80, 37, 55, 80, 60]})
```

Write the code to find :

(i) 'mean' value from above dataframe df over the index axis. (Skip NaN value)

(ii) 'sum' function to find the sum of all the values over the index axis.

(iii) ' median' of the dataframe df.

OR

Give Dataframe df is as follows :

Name	Phy	Chem	Math	IP
Kamla	50	80	60	80
Seema	40	40	80	90
Suresh	80	50	80	70
Santosh	65	60	70	70

(i) Write command to compute the sum of all subjects of every students of the data frame.

(ii) Write command to compute mean of column 'IP'.

(iii) Write command to compute average all subjects for 'Kamla'

(h) Find the output of the following code: 3

```
import pandas as pd
data = [{'Rollno': 1, 'Name': 'Shyam', 'Marks':60 },
        {'Rollno': 2, 'Name': 'Kamal', 'Marks':70 },
        {'Rollno': 5, 'Name': 'Sheela', 'Marks':30 }]
df1 = pd.DataFrame(data, columns=['Rollno', 'Name'])
df2 = pd.DataFrame(data, index=['Rollno', 'Name', 'Marks'],
              columns=['Rollno', 'Marks'])
print(df1)
print(df2)
```

(i) A datafraame **df** stores data year, month & passenger as bellow :   4

```
      Year       Month      Passengers
0     2010       Jan        25
1     2010       Mar        50
2     2012       Jan        35
3     2010       Dec        55
4     2012       Dec        65
```

Using above dataframe write command for following :

(a) Compute Total Passenger per year

(b) Computer Average passenger per year

Hint : use of pivot_table

SECTION –B

3. (a) What do you think by Software Engineering ?   1

(b) Identify which one is the need of Software Engineering from following :   1

i) Software Engineering

ii) Cost Control

iii) Data Analysis

iv) Data mining

(c) What is pair programming concept?   1

(d) What is Feasibility Study in area of Software Engineering ?   2

OR

Differentiate between Waterfall Model and Spiral model.

(e) Give pictorial representation of Waterfall Model and give one advantage and one
   disadvantage of Waterfall Model .   3

OR

Give pictorial representation of Spiral Model and give one advantage and one
disadvantage of Spiral Model .

(f) What is Version Control System, what are the types of Version Control System ?   3

(g) Draw a use case diagram and identify the **actors** and **communication** for the situations :
   i) A period of Computer Class subject 'IP'   4
   ii) Booking of OLA Taxi

OR

Look at the following use case diagrams and write the actors and the situation depicted
by the use case diagrams :
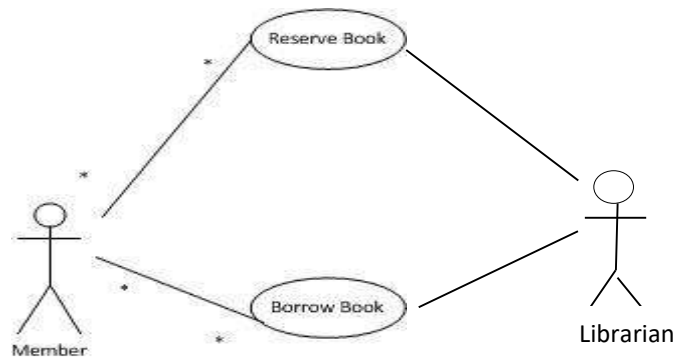
SECTION –C

4. (a) Differentiate between Django **GET** and **POST** method .   1

(b) What is use of **COMMIT** in SQL ?   1

OR

What is use of **ROLLBACK** in SQL

(c)   Write Django command to create a new Project.   1

(d) Find which is not a correct start of SQL Command.   1
   i) SELECT
   ii) MODIFY
   iii) DELETE
   iv) ALTER

(e) **"execute()"** in python-mysql connectivity :   1
   i) Checks correct link of Database
   ii) Execute Database to close()
   iii) Execute SQL Query after connection to get result
   iv) Execute command to display output on screen

(f) Pinkiy has recently started learning Database. Help her in understanding : 3
    i) Primary key and Candidate key
    ii) Degree and Cardinality

(g) On the basis of 'Student" table below answer the questions : 3

RollNo	Name	Class	DOB	Gender	City	Marks
1	Nanda	X	06-06-1995	M	Agra	551
2	Saurabh	XII	07-05-1993	M	Mumbai	462
3	Sanal	XI	06-05-1994	F	Delhi	400
4	Trisla	XII	08-08-1995	F	Mumbai	450
5	Store	XII	08-10-1995	M	Delhi	369
6	Marisla	XI	12-12-1994	F	Dubai	250
7	Neha	X	08-12-1995	F	Moscow	377
8	Nishant	X	12-06-1995	M	Moscow	489

i)   Give output of following SQL
     ```
     SELECT GENDER, COUNT(*) FROM STUDENT GROUP BY GENDER;
     ```
ii) Find the Degree and Cardinality of the table.
iii) Write SQL to display different Cities available in table.

(h) Write SQL (i) to (iv) and output for (v) and (vi) based on following table : 4

Table: Emp

EMPNO	ENAME	JOB	HIREDATE	SAL	COMM	DEPTNO
7566	JONES	MANAGER	02-Apr-81	2975	NULL	20
7654	MARTIN	SALESMAN	28-Sep-81	1250	1400	30
7698	BLAKE	MANAGER	01-May-81	2850	NULL	30
7782	CLARK	MANAGER	09-Jun-81	2450	NULL	10
7788	SCOTT	ANALYST	09-Dec-82	3000	NULL	20

i)   To list the Employee Name who are not getting any commission(COMM).
ii)   Display Name of Employee whose name start with character 'A'.
iii) To count number of Jobs available in company i.e. in EMP table.
iv)   To display Employee no. and name of employees in decreasing order of Salary.
v)   `SELECT ENAME, SAL*10 FROM EMP WHERE DEPTNO=10;`
vi)   `SELECT YEAR(HIREDATE) FROM EMP WHERE DEPTNO=20 AND JOB='ANALYST'`

OR

(i)   Write Python-MySQL connectivity code for following situation :
      In a school, a database named "school" is created in mysql whose password is
      "kvs". Suman is trying to delete a record of student whose rollno is 10.

(ii)   Write the code in python to write the following row contents in "student.csv" file.
```
row = ['4', ' Danny', ' New York']
```

SECTION –D

5. (a) Which one of the following comes under Cyber Crime :   1
         i) Murder
         ii) Chain Snatching
         iii) Fighting
         iv) Online Scams

(b) Expand the term GNU.   1

(c) Define the term Plagiarism.   1

(d) Shyam has received an unknown call stating that he won prize money of Rs. 5 lacs, and the caller saying to pay Rs. 5000/- as a processing fee to get this prize money.
You are requested to help him to deal with this situation.   2

(e) State one situation of using technology for each of following :   2
         i) Way in which technology can harm society
         ii) Way in which technology can be beneficial for society

(f) Name any three types of Cyber Crimes and give one point for each to protected.   3
OR
Sheela is not understanding difference between following :
         i) Freeware software
         ii) Open Source Software
         iii) Proprietary Software
You are requested to help Sheela to get differences between these three.

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Class : 12ᵗʰ   **Subject : Informatics Practices (IP)**
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MARKING SCHEME

1.   (a) [70 60 50]   1
     (b) var   1
     (c) plt.bar(x,y)   ½
          Plt.xlabel("No. of Students attended")   ½

OR

     plt.plot(x,y)   ½
     plt.title("Status of Workshop ")   ½

     (d) [5 6 7 8]   1
        6   1

     (e) import matplotlib.pyplot as plt   ½ mark
          x=['JAN', 'FEB', 'MAR', 'APR','MAY','JUN']   ½ mark for both list
          y=[30,50,50,30,30,60]
          plt.plot(x,y)   ½ mark
          plt.title("Monthly Attendance")   ½ mark

     (f) Pandas Series is a one-dimensional labeled array capable of holding data of any type (integer, string, float, python objects, etc.). The axis labels are collectively called index.
     Example :
     Import pandas as pd   *1 mark for definition 1 mark for example*
     data =pd.series([1,2,3,4,5])
     print data

     (g)   n=np.eye(3)   1
             x=np.where((n%2)==1)   ½
             y=np.where((n%2)==0)   ½
             for i in x: ½
                     n[x]=0
             for i in y: ½
                     n[y]=1
             print(n)

OR

             import numpy as np
             n=np.ones((3,3), dtype='int16')   1
             x=np.where(n==1)   1
             for i in x: 1
                     n[i]=2

```
            print(n)
```

2. (a) rename()   1
    (b) df.head()   1

<p align="center">OR</p>

   pd.read_csv('data.csv')   1

    (c)   0   2   1
            1   4
            2   6
            3   8
            4   10

    (d) df.loc[2]=[3,'Ranu',44]   1
    (e) Pivoting means to use unique values from specified index/columns to form apex of the resulting dataframe. Pivot() and pivot_table() methods
                    (1 mark and ½ for each example)

    (f)   import pandas as pd
            dtf={'Subject':['Phy','Chem','Math','CS'],   2
                'Teacher':[10,5,8,12],
                'School':['KV','JNV','JNV','KV']
                }
            K=pd.DataFrame(dtf)
            print(K)

<p align="center">OR</p>

            import pandas as pd
            df = pd.DataFrame([[1,'Shayam'],[2,'Mohan'],[3,'Kamla'],[4,'Kamalesh']],
                        columns = ['Rollno','Name'])
            print(df)

    (g)   print(df.mean(axis = 1, skipna = True))   3
            print(df.sum(axis = 1, skipna = True))
            print(df.median())

<p align="center">OR</p>

            df.sum()
            df['IP'].mean()
            df.loc[0, 'Phy':'IP'].mean()

    (h)   Rollno   Name
                                            Total 3 marks
            0   1   Shyam
            1   2   Kamal   ½ marks for each column
            2   5   Sheela

                    Rollno   Marks
```

|        |   |    |
|--------|---|----|
| Rollno | 1 | 60 |
| Name   | 2 | 70 |
| Marks  | 5 | 30 |

(i)     (a) df.pivot_table(index='Year', values='Passengers', affgun='sum')     2

           (b) df.pivot_table(index='Month', values='Passengers', affgun='mean')     2

3. a) Correct answer     1

   b) Cost Control     1

   c) Correct answer     1

   d) Correct definition OR Difference     2

   e) Correct dig. (1 mark)

     1 advantage and 1 disadvantage (1 mark each)

   f) Definition (1 mark)

     2 types of VCS (1 mark each)

        i)      Centralized VCS

        ii)     Distributed VCS

   g) Correct Actor and correct Communication (1 mark each)

<center>OR</center>

     Correct actor (1 mark each) and correct situation (1 mark each)

4. (a) Correct ans (1 mark)

   (b) Correct ans (1 mark)

   (c) django-admin startproject myproj     (1 mark)

   (d) MODIFY    (1 mark)

   (e) option iii) Execute SQL Query after connection to get result     (1 mark)

   (f) Correct (1½ mark each partial mark allowed)

   (g) i)     Gender       count(*)            (1 mark)

           MALE        4

           FEMALE     4

    ii) Degree : 7       Cardinality : 8            (1 mark)

    iii) SELECT DISTINCT CITY FROM STUDENT;       (1 mark)

   h) (i) Select ename from emp where comm is null;       Total 4 marks

     (ii) Select ename from emp where ename like 'A%';       1 mark each for correct SQL

     iii) Select distinct count(Job) from emp;       ½ marks each for correct output

     iv) Select empno, ename from emp order by sal desc;

     v) CLARK     24500

     vi) 1982 or 82

<center>OR</center>

   i)       Correct code 2 marks

         Correct connection ½ mark

         Correct cursor creation ½ mark

         Correct execute() ½ mark

         Correct Commit()      ½ mark

ii)     Correct code 2 marks

    Import csv                                         ½ mark

    with open('student.csv ', 'a') as csvFile:         ½ mark    (in any way)

    writer = csv.writer(csvFile)                       ½ mark

    writer.writerow(row)                               ½ mark

5. (a) SCAMS      1 mark
   (b) GNU's Not Unix      1 mark
   (c) Correct definition 1 mark
   (d) Correct dealing   2 mark  (partial mark can be awarded)
   (e) 1 mark for each
   (f) 1 mark for rach

<p style="text-align:center">*******************</p>