

Pre-Board-I Examination, 2019-20  
Informatics Practices (065)  
Class – XII

Date: 16 January, 2020

Max. Marks: 70  
Time Allowed: 3 hours

General Instructions:

1. All questions are compulsory.
2. Question Paper is divided into 4 sections A, B and C
3. Section A comprises of questions (1 and 2)
  - i. Questions 1 comprises Data Handling -2(DH-2)(Series, NumPy)
  - ii. Questions 2 comprises questions from Data Handling-2(DH-2) Data Frames and its operations)
4. Section B comprises of questions from Basic Software Engineering
5. Section C comprises of questions from Data Management-s (DM-2)
6. Section D comprises of questions from Society, Law and Ethics(SLE-2)

**SECTION-A**

1. (a) Explain Data Frame? Can it be considered as 1D array or 2D array? [2]
- (b) Write a python code to form a series from the sorted data, find and display the Q1 and Q3 quartiles in the series: 4,7,16,20,21,22,37,39,44,55,61,63,78. [1]
- (c) Why is the following code not producing any result? Why is it giving errors? [2]  
(Note: All required libraries have been imported and are available)

```
a=range (10,50,12)  
b=range (90,200,20)  
matplotlib.pyplot(a,b)
```

OR

Mr. Sanjay wants to plot a bar graph for the given set of values of subject on x-axis and number of students who opted for that subject on y-axis. Complete the code to perform the following:

- (i) To plot the bar graph in statement 1
- (ii) To display the graph in statement 2

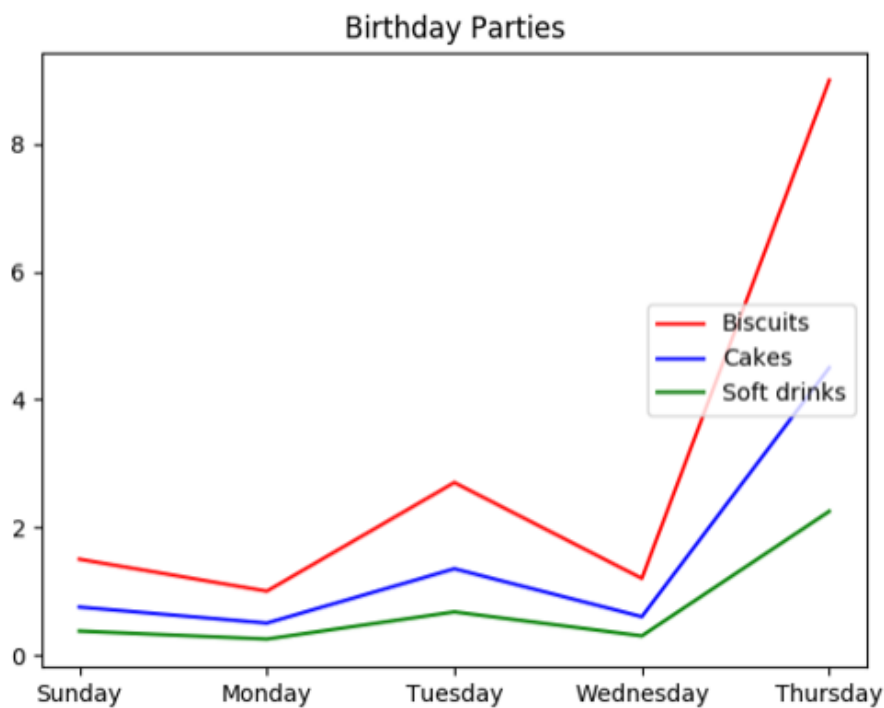
```
import matplotlib.pyplot as plt  
x=['Hindi', 'English', 'Science', 'SST']  
y=[10,20,30,40]
```

\_\_\_\_\_ Statement 1  
\_\_\_\_\_ Statement 2

- (d) 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))
```

- (e) Write a code to plot the sale of different items in birthday parties as shown in the figure given below: [2]



- (f) How are Series and Data Frame different in python? Give examples of each. [2]
- (g) Write a NumPy program to create a 3 X 3 identity matrix, i.e., diagonal elements are 1, the rest are 0. Replace all 0 to random number from 10 to 20. [3]

OR

Write a NumPy program to create a 3 X 3 identity matrix, i.e., non-diagonal elements are 1, the rest are 0. Replace all 0 to random number from 1 to 10.

Answer the following questions

- 2 (a) Which of the following input cannot be accepted by Data Frame? [1]
- Structured ndarray
  - DataFrame
  - Series
  - iv) None of the above**

- (b) Write the command using insert () function to add a new column in the last place (3<sup>rd</sup> place) named “Salary” from the list Sal= [10000,15000,20000] in an existing data frame named EMP already having 2 columns. [1]

OR

What will be the output of following code?

```
import pandas as pd
import numpy as np
arr1=np.array([[1,2,3],[4,5,6]])
df=pd.DataFrame(arr1,columns=['num1','num2','num3'])
print(df.iloc[0,2])
```

- (c) What is the default value of inplace clause when we apply processing on data frame? [1]
- (d) Write a small python code to drop a row from data frame labelled as ‘df’. [1]
- (e) If df is a data frame, write small python code to display “Data Frame is empty”, if the data frame does not contain any data or “Data frame contains the data” if the data frame is not empty. [2]
- (f) Write a python code to create a data frame with appropriate headings from the list given below: [2]

```
['DP8','Sukanya',90], ['DT6','Sabina',87], ['DP2','Ashok',80],
['DN6','Kinza',67]
```

OR

Write a small python code to create a data frame with headings (id and name) from the list given below:

```
['DP8','Sukanya'], ['DT6','Sabina'], ['DP2','Ashok'],
['DN6','Kinza']
```

- (g) Write a Pandas program to select rows where number of attempts in the examination is less than 2 and score greater than 15. [3]

	name	score	attempts	qualify
a	Anastasia	12.5	1	yes
b	Dima	9.0	3	no
c	Katherine	16.5	2	yes
d	James	NaN	3	no
e	Emily	9.0	2	no
f	Michael	20.0	3	yes
g	Matthew	14.5	1	yes
h	Laura	NaN	1	no
i	Kevin	8.0	2	no
j	Jonas	19.0	1	yes

OR

Given a data frame **df1** as shown below:

	mintemp	maxtemp	Rainfall	Humidity
0	20.6	28.9	24.3	30
1	20.7	28.7	26.5	40
2	21	30	24.8	70
3	19	25	25.9	60
4	7.6	19.2	15.4	50
5	8.9	18.9	15.2	48
6	13.4	22.1	14.1	25
7	14.8	24.5	13.6	55
8	20.8	35.4	18.4	18
9	20	34.5	19.5	27
10	21.1	34.5	12.7	52

- i) Write command to compute sum of every column.
  - ii) Write command to compute mean of column 'Rainfall'.
  - iii) Write command to compute average of all the columns for last 10 rows only.
- (h) Find the output of the following code: [3]

```
import pandas as pd
data = [{'a': 1, 'b': 2, 'd':3, 'm':4}, {'a': 5, 'b': 6, 'c':
7, 'l':90}, {'a':89, 'c':100, 'm':657, 'b':989}]
df1 = pd.DataFrame(data,
index=['one', 'two', 'three'],
columns=['d', 'b'])
df2 = pd.DataFrame(data,
index=['one', 'two', 'three'],
columns=['l', 'b1'])
print(df1)
print(df2)
```

- (i) Write the code in pandas to create the following data frames: [4]

	df1			df2	
	mark1	mark2		mark1	mark2
0	30	20	0	10	15
1	40	45	1	20	25
2	15	30	2	20	30
3	40	70	3	50	30

Write the commands to do the following operations on the data frames given above:

- i) To add data frames df1 and df2
- ii) To subtract df2 and df1
- iii) To rename column **mark1** in both the data frames df1 and df2.
- iv) To change index label of df1 from 0 to zero and from 1 to one.

**SECTION-B**

3. (a) Find out the Second phase of Waterfall model: [1]
- i. Operation and Maintenance
  - ii. Requirement Specification
  - iii. Analysis and System Design
  - iv. Integration and Unit testing**
- (b) \_\_\_\_\_ is the process of checking the developed software for its correctness and error free working [1]
- i. Specification
  - ii. Design/Implementation
  - iii. Validation/Testing
  - iv. Evolution
- (c) What is the difference between a Commit and a Push request on a Version Control System? [1]
- (d) List any two differences between Incremental model and Spiral model in developing complex software projects. [2]

OR

“Component-based model develops software by selecting appropriate components and then assemble them.” What do you understand by this statement?

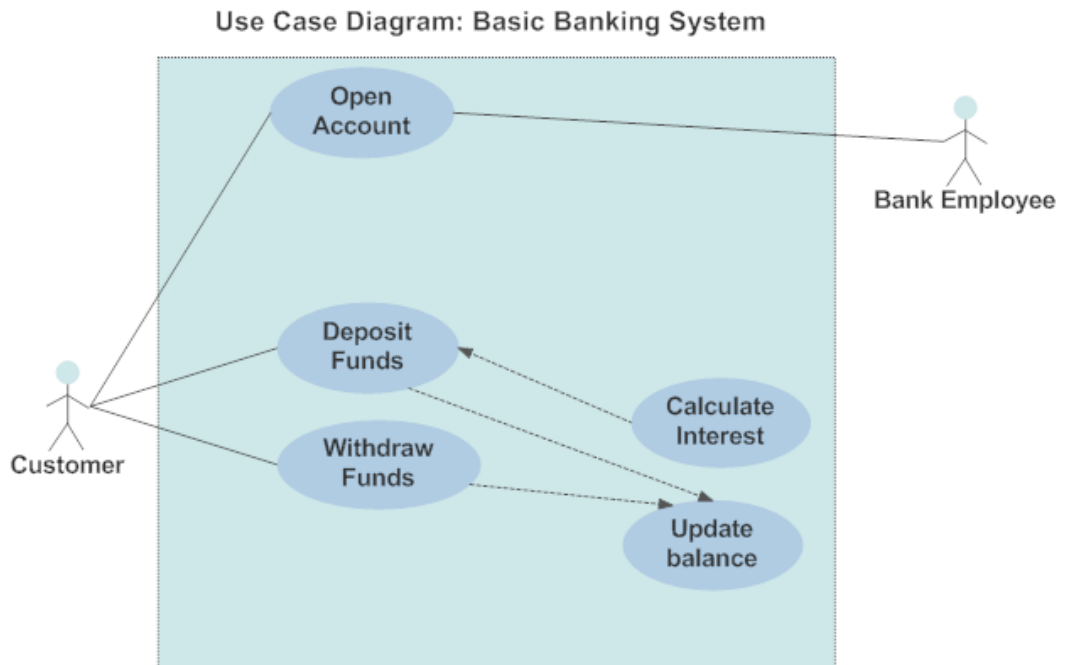
- (e) Write down any one situation where waterfall software process can be used. Also mention one advantage and one disadvantage of waterfall software process. [3]

OR

Write and explain scrum events in one line.

- (f) What is pair programming? Mention at least two advantages and disadvantages of pair programming. [3]
- (g) Draw a use case diagram for a Taxi Booking Application. [4]

OR



Find out the following in above use case diagram:

- i. Actor
- ii. Relation
- iii. Use cases
- iv. Main Flow

### SECTION-C

4. (a) To register any app with project which python file needs to be modified: [1]

- i. urls.py
- ii. views.py
- iii. setting.py
- iv. \_init\_.py

(b) What is the use of ROLLBACK in SQL? [1]

OR

What is the use of COMMIT in SQL?

(c) CSV stands for \_\_\_\_\_ . [1]

(d) Which is called as a virtual table in SQL? [1]

- i. INNER JOIN
- ii. JOIN
- iii. VIEW
- iv. NONE

(e) Which statement is correct? A table can have [1]

- i. many primary key and many unique key
- ii. one primary key and one unique key
- iii. one primary key and many unique key
- iv. many primary key and one unique key

(f) Shewani has recently started working in MySQL. Help her in understanding the difference between the following: [3]

- i. Where and having clause
- ii. count(column\_name) and count(\*)
- iii. candidate key and primary key

(g) On the basis of following table answer the given questions: [3]

Table: sports

no	class	name	game1	grade1	game2	grade2
10	7	Sameer	Cricket	B	swimming	A
11	8	Sujit	Tennis	A	Skating	C
12	7	Kamal	Swimming	B	Football	B
13	7	Veena	Tennis	C	Tennis	A
14	9	Archana	Basketball	A	NULL	A
15	10	Arpit	cricket	A	athletics	C

- i. Display the names of the students who have grade 'A' in either game1 or game2 or both.
- ii. What will be the output of the following query?  
`SELECT MAX(class) FROM sports;`
- iii. Write the SQL query to delete the row from the table where there is no value for game2

- (h) Write commands in SQL for (i) to (iii) and output for (iv) and (v). [4]

**Table: Teacher**

id	name	department	hiredate	category	gender	salary
1	Taniya	Social Studies	03/17/1994	TGT	F	25000
2	Abhishek	Art	02/12/1990	PRT	M	20000
3	Sanjana	English	05/16/1980	PGT	F	30000
4	Vishwajeet	English	10/16/1989	TGT	M	25000
5	Aman	Hindi	08/01/990	PRT	F	22000
6	Pritam	Math	03/17/1980	PRT	F	21000
7	Rajkumar	Science	09/02/1994	TGT	M	27000
8	Sital	Math	11/17/1980	TGT	F	24500

- i. To display all information about teachers of Female PGT
- ii. To list names, departments and date of hiring of all the teachers in descending order of date of joining.
- iii. To count the number of teachers and sum of their salary department wise.
- iv. `SELECT MAX(hiredate), gender FROM teacher group by gender;`
- v. `SELECT COUNT(DISTINCT(department)) FROM teacher.`

OR

- i. In a school, a database named “school” is created in mysql whose password is”cbse”. Smith is trying to add a new record of a student having details (3,’Michelle’,’Agartala’) in a ‘student’ table.
- ii. Write the code in python to read the contents of ‘number.csv’ file consisting of data from a mysql table and print the data of the table on the screen in the tabular form of the table.

#### SECTION-D

5. (a) What types of data are stolen by cyber-criminals in most of the cases? [1]
- i. Data that will pay once sold
  - ii. Data that has no value
  - iii. Data like username and passwords only
  - iv. Data that is old
- (b) Give one benefit of e-Waste recycling? [1]
- (c) \_\_\_\_\_ is a cryptocurrency which is in the form of a software code written and controlled by an Open Source Software. [1]
- (d) Reena has recently shifted to a new city and new college. She does not know many people in her new city and college. But all of a sudden, someone starts posing negative, demeaning comments on her social networking profile, college site’s forum, etc. She is also getting [2]



repeated mails from unknown people. Every time she goes online, she finds someone chasing her online.

- i. What is happening to Reena?
- ii. What action should she take to stop them?

(e) Write the appropriate usage of social network. [2]

(f) Explain the role of online social media campaigns and crowdsourcing in society. [2]

OR

Ms. Samtha has many electronic gadgets which are not usable due to outdated hardware and software. Help her to find any two best ways to dispose the used electronic gadgets.

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