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COMMON PRE-BOARD EXAMINATION: 2019-20

INFORMATICS PRACTICES (065) NEW

Time allowed: 3 hours

Max. Marks: 70

Scoring key/Marking Scheme

SECTION A

Q.1 (a) Find the output of the following Python code: 1

```
x="hello world"  
print(x[:2],x[:-2],x[-2:])
```

Ans he hello wor ld (1 mark for correct answer)

(b) Fill in the blank: 1

Numpy provides _____ function to calculate variance

Ans Var() (1 mark for correct answer)

(c) import matplotlib.pyplot as plt 1

```
subjects = ['Civil', 'Mechanical', 'Electrical', 'CSE']  
numberofstudents = [8,18,36,24]
```

Complete the above code to plot bar graph (subject on x-axis and numberofstudents on y-axis) and display it.

Ans plt.bar(subjects, numberofstudents) (1/2 mark for each statement)
plt.show()

OR

Fill in the blank

You can create a scatter plot matrix using the _____ method in pandas.tools.plotting.

Ans scatter_matrix (1 mark for correct answer)

(d) Predict the output of the following code fragments. 2

```
x=np.array([1,2,3])  
y=np.array([3,2,1])  
z=np.concatenate([x,y])  
prit(z)
```

Ans [3,2,1,1,2,3] (2 marks for correct answer)

(e) Write a program to calculate covariance, correlation and regression for the given data sets 2
for the number of items purchased with their unit price as under.

```
unit_price =[10,30,50,80,100]
No_items = 30,45,40,20,40]
```

Ans C=cov(unitprice,no_items)
P=correff(unitprice,no_items)
(1 mark for each correct answer)

(f) What is pyplot and Histogram? 2

Ans The pyplot is one of the interfaces of matplotlib library of Python.
Histogram is a statistical tool used to summarize discrete or continuous data.
(1 mark for each correct answer)

(g) Consider following two arrays: 3

```
Array1= array([0,1,2],[3,4,5],[6,7,8])
and
Array2= array([10,11,12],[13,14,15],[16,17,18])
\Write NumPy command to concatenate Array1 and Array2:
```

(a) Row wise (b) Column wise

(1 and ½ marks for each correct answer)

Ans (a)numpy.concatenate((Array1, Array2))
(b) numpy.concatenate((Array1, Array2), axis=1)

OR

Given a data frame namely Fruits is given below(fruit names are row labels)

	Color	Count	Price
Apple	Red	3	120
Apple	Green	9	110
Pear	Red	25	125
Pear	Green	26	150
Lime	Green	99	70

Write code statement to

- (a) Find all rows with label "Apple". Extract all columns
- (b) List only the columns Count and Price using loc
- (c) List only rows with labels 'Apple' and 'Pear' using loc

Ans (a) data.loc['Apple', :]
(b) data.loc[:, ['Count', 'Price']]
(c) data.loc[['Apple', 'Pear']]
(1 mark for correct answer)

Q.2 (a) To create sequences of numbers, NumPy provides a function _____ analogous to range that returns arrays instead of lists. 1

- a) arange
- b) aspace
- c) aline
- d) all of the Mentioned

Ans a) arrange (1 mark for correct answer)

(b) Name the function used to create frequency polygon. 1

Ans Use the function hist() with histtype=step

OR

What is the shape of the following



4	5
4	5
4	5
4	5

Ans Size of matrix is 4x2. (1 mark for correct answer)

(c) Find the output

A = "Kendriya Vidyalaya sangathan"

Print(A[2:8])

Ans ndriya (1 mark for correct answer)

(d) Point out the correct statement:

- a) If data is a list, if index is passed the values in data corresponding to the labels in the index will be pulled out
- b) NaN is the standard missing data marker used in pandas
- c) Series acts very similarly to a array
- d) None of the Mentioned

Ans b) (1 mark for correct answer)

(e) Write any difference between Numpy Array and List.

Ans

NumPy Array

numpy.Array works on homogeneous (same) types.

Python list supports adding and removing elements.

Can't contain elements of different types

Less memory consumption

Faster runtime execution

List

Python list is made up for heterogeneous (different) types.

numpy.Array does not support addition and removal of elements.

Can contain elements of different types

More memory consumption

Runtime execution is comparatively slower than Arrays.

(1/2 mark for each difference)

(f) Create an ndarray with values ranging from 10 to 49 each spaced with a difference of 3.

Ans a=np.array(10,50,3) assuming that Numpy is imported as np.

(2 marks for correct answer)

OR

Write one python program to find the following from the given dataframe DF:

Rollno	Name	Age	Marks
11	Aruna	18	68
12	Mohini	14	47
13	Kiya	13	78
14	Lakshmi	16	87
15	Ravisha	14	60

a) Maximum marks and minimum marks

b) Mean and mode of age of the students

Ans.:

```
a. print("Maximum marks = ", DF["Marks"].max())
print("Minimum marks = ", DF["Marks"].min())
b. print("Mean of Age = ",DF["Age"].mean())
print("Mode of Age = ",DF["Age"].mode())
(1 mark for each correct answer)
```

(g) Write python statements to create a data frame for the following data. 3

Name	Age	Designation
YAMINI	35	PRINCIPAL
DINESH	40	SYSTEM MANAGER
SHYAM	50	TEACHER

Ans

```
import pandas as pd
d={'Name':['YAMINI','DINESH','SHYAM'],
'Age':[35,40,50],'Designation':['PRINCIPAL','SYSTEM MANAGER','TEACHER']}
df=pd.DataFrame(d)
```

(1 mark for each correct statement)

OR

1 marks for their names + 1 marks for age + 1 marks for creating Dataframe

(h) What is covariance and correlation? Give Examples. 4

Ans Covariance is a statistical measure that shows whether two variables are related by measuring how the variables change in relation to each other.

Correlation is the scaled measure of covariance. Besides, it is dimensionless. In other words, the correlation coefficient is always a pure value and not measured in any units. (2 Marks for definition and 1 for example).

(i) Create a horizontal bar graph of following data. Add suitable labels. 3

City	Population
Delhi	23456123
Mumbai	20083104
Bangalore	18456123
Hyderabad	13411093

Ans

```
import numpy as np
import matplotlib.pyplot as plt
Cities=['Delhi','Mumbai','Bangalore','Hyderabad']
Population=[23456123,20083104,18456123,13411093]
plt.barh(Cities,Population)
plt.ylabel('Cities')
plt.xlabel('Population')
plt.show()
```

(1/2 mark for each correct statement)

SECTION B

Q.3 (a) Agile Software Development is based on

a) Incremental Development

b) Iterative Development

1

- c) Linear Development
d) Both Incremental and Iterative Development
- Ans d) Both Incremental and Iterative Development
- (b) Which one of the following models is not suitable for accommodating any change? 1
- a) Build & Fix Model
b) Prototyping Model
c) RAD Model
d) Waterfall Model
- Ans d) Waterfall Model
- (c) Write the major advantage of using Incremental Model? 1
- Ans Easier to test and debug & It is used when there is a need to get a product to the market early
- (d) Explain version control with its type. 2
- Ans A version control system is a specific, specialized set of software tools that help a software team to manage changes to source code over time.
1. Centralized Version Control System
 2. Distributed Version Control System
- (1 mark for definition and 1 for its type).
- OR
- What are the differences between software verification and software validation?
- Ans (1 mark for each difference).
- (e) What are the differences between water fall model and evolutionary model of software engineering? 3
- Ans In Water Fall model all phases are completed one by one in linear fashion and we get software after completing all the stages whereas in Evolutionary Model we are adding new as suggested by user feedback to already build in and it is waterfall with iterations. Water Fall model works well for smaller projects and projects where requirements are well understood whereas the Evolutionary model is suitable for large projects which can be decomposed into a set of modules for incremental development and delivery.
(1 Mark for each difference)
- OR
- Write down any one situation where Spiral delivery model can be used. Also mention one advantage and one disadvantage of this model.
- Ans Situation to use Spiral model:
When project is large, when releases are required to be frequent, when risk and costs evaluation is important. For medium to high risk projects.
Advantage: Additional functionality or changes can be done at a later stage.
Cost estimation becomes easy as the prototype building is done in small fragments.
Disadvantage: Risk of not meeting.
(1 mark for each correct answer)
- (f) What are the responsibilities of a Scrum Master? 3
(1/2 mark for each responsibility).
- (g) Draw the use case diagram for banking system. 4
(2 marks for drawing use case and 1 mark for each actor).

SECTION C

- Q.4 (a) How many phases are there in Scrum? 1
 a) Two
 b) Three
 c) Four
 d) Scrum is an agile method which means it does not have phases
 Ans b) Three
- (b) MVT in Django framework stands for..... 1
 Ans Model View Template (1 mark for correct answer)
 OR
 Write the python command to start the server in Django.
 Ans python manage.py runserver
- (c) Write the name of any two aggregate functions in MySQL. 1
 Ans a) COUNT
 b) SUM/AVG
 c) MIN/MAX (1/2 mark for each correct answer).
- (d) Which clause is similar to “HAVING” clause in Mysql? 1
 a) SELECT
 b) WHERE
 c) FROM
 d) None of the mentioned
 Ans b) WHERE (1 mark for correct answer)
- (e) Which keyword is used to rename the resulting attribute after the application of the aggregation function? 1
 a) rename
 b) as
 c) replace
 d) to
 Ans b) as (1 mark for correct answer)
- (f) What are the steps to database connectivity with python application. 3
 Ans Step 1- Start python application
 Step 2- import the packages required for database programming
 Step 3- open a connection
 Step 4- create a cursor instance
 Step 5- execute a query
 Step 6- extract data from result set
 Step 7- clean up the environment
 (1/2 mark for each step)
- (g) What do you mean by degree of a relation? 3
 Write an SQL query to create the table ‘Menu’ with the following structure.

Field	Type	Constraint
ItemCode	Varchar(5)	Primary Key
ItemName	Varchar(20)	Default ‘CPU’
Category	Varchar(20)	Check either Software or Hardware

Price	Decimal(5,2)	Greater than 1000
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- Ans 1 mark for definition of degree.
2 marks for correct SQL query for creating table Menu.
- (h) Consider the following table:

4

Table: PharmaDB

RxID	DrugID	DrugName	Price	PharmacyName	PharmacyLocation
R1000	5476	Amlodipine	100.00	Rx Pharmacy	Pitampura, Delhi
R1001	2345	Paracetamol	15.00	Raj Medicos	Bahadurgarh, Haryana
R1002	1236	Nebistar	60.00	MyChemist	Rajouri Garden, Delhi
R1003	6512	VitaPlus	150.00	MyChemist	Gurgaon, Haryana
R1004	5631	Levocitrezine	110.00	RxPharmacy	South Extension, Delhi

Write commands in SQL for (i) to (iv):

- I. To increase the price of “Amlodipine” by 50.
- II. To display all those medicines whose price is in the range 100 to 150(both values inclusive).
- III. To display the Maximum price offered by pharmacy located in “Gurgaon”
- IV. To display the Drug ID, DrugName and Pharmacy Name of all the records in descending order of their price.

OR

- i. Explain what is commit and rollback in MySQL?

Ans.:

Once a program has completed executing the query with your changes and you want to commit the changes to the database, you need to call commit() method on MySQL connection. Its syntax is: connection.commit()

When one of the transactions fails to execute and you want to revert or undo all the changes, then we need to call a rollback method of MySQL connection object. Its syntax is: connection.rollback()

- ii. Write a python Database connectivity code that deletes record from table “Books” of database named “School” where subject is “Mathematics”.

Ans.

```
import mysql.connector as mc
conn = mc.connect(host="localhost", user="root", database="School",
password="root")
cursor = conn.cursor()
query = "Delete FROM Books WHERE subject = "Mathematics"
```

```
cursor.execute(query)
conn.commit()
conn.close()
```

SECTION D

- Q.5 (a) Stealing someone's intellectual work and representing it as your own known as:- 1
- (i) phishing
 - (ii) scam
 - (i) plagiarism
 - (ii) intellectual property
- Ans (iii) plagiarism (1 mark for correct answer).
- (b) What is identity theft? 1
- Ans It is the theft of personal information in order to commit fraud.
(1 mark for correct answer).
- (c) Mr. Alex is confused between Shareware and Open Source. Mention at least one points of differences to help him understand the same. 1
- Ans Shareware is software, which is made available with the right to redistribute copies, but it is available for limited time, often a certain period of time, then a license fees should be paid. Its source code is not available and modification is not allowed.
Open source software is software whose source code is available to customers. The customers are allowed to modify and re-distribute it. License period is also unlimited.
(1 mark for any 1 difference).
- (d) What is e-waste? How we can manage it (two points)? 2
- Ans Electronic waste or e-waste describes discarded electrical or electronic devices.
Used electronics which are destined for refurbishment, reuse, resale, salvage, recycling through material recovery, or disposal are also considered e-waste.
We can manage e-waste in many ways
- (i) Give away or donate your e-waste
 - (ii) Learn about your local recycling options
- (1 mark for definition and 1 for managing 2 points).
- (e) What measures can you take to curb online frauds? 2
- Ans Use original software, use of proper antivirus and update is regularly, don't disclose user id, password, ATM No., Pin etc to someone else. Don't open untrusted link. Don't download from free shower websites.
- (f) What are intellectual property rights? Why should intellectual property rights be protected? 3
- Ans These are rights of the owner of information to decide how much information can be exchanged, shared or distributed and right to decide the pricing of information for sharing. These rights must be protected
1. To ensure distribution of new ideas and technology
 2. To promote investment in national economics.
- (1 mark for part one and 2 for part second.)

OR

What is Phishing? What security measures can be taken against phishing attacks?

Ans. 1 mark for definition and 2 marks for atleast 2 security measures that we should take.

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