KENDRIYA VIDYALAYA SANGATHAN : KOLKATA REGION

FIRST PREBOARD E

INFORMATICS PRACTICES NEW (065) - CLASS XII

Max Marks: 70 **Time: 3 hrs**

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 D comprises of questions from Society, Law and Ethics-2(SLE-2)

SECTION- A		
1.		
(a)	Find the output of following program. import numpy as np d=np.array([10,20,30,40,50,60,70]) print(d[-5:])	1
(b)	State at least two differences between a numpy array and a list.	1

(c)	Fill in the blank with appropriate statement using numpy method to calculate the covariance and correlation coefficient of the two given 1D arrays(A,B)
	import numpy as np
	A=np.array([1,2,3,4,5])
	B=np.array([3,4,0,-1,-4])
	result_covar=_____ # COVARIANCE
	result_coeff=_____ #CORRELATION COEFFICIENT
		2

(d)	What will be the output of the following python code: import pandas as pd import numpy as np d = {'Student':['Ali','Ali','Tom','Tom'],\ 'House':['Red',Red,'Blue',Blue'],\ 'Points':[50,70,60,80]}	2

	df =pd.DataFrame(d) df1 = df.pivot_table(index='Student',columns='House',values='Points',aggfunc=np.sum) print(df1)	
(e)	Given following ndarray A: ([[2, 4, 6], [7, 8, 9], [1, 2, 3]]) Write the python statements to perform the array slices in the way so as to extract (i) First row (ii) Second Column	2
(f)	Write a python statement to fill in the blanks so that the given output may be achieved: import pandas as pd import numpy as np d = {'Rollno':[101,102,103,104],\ 'ECO':[70,80,50,80],'BST':[60,50,60,90]} df = pd.DataFrame(d) df1 = _____ print(df1) **Rollno 410** **ECO 280** **BST 260** **dtype: int64**	2
g)	Write python statement to create a two- dimensional array of 4 rows and 3 columns . The array should be filled with ones.	1
h)	Differentiate between apply() and applymap() functions **OR** Find the output for the following: import pandas as pd import numpy as np d = {'Marks1':[10,20,30,40],\ 'Marks2':[50,70,60,80]} df=pd.DataFrame(d) print(df) print(df.apply(np.cumsum))	2
2.		
a)	For the given code fill in the blanks so that we get the desired output with sorting the dataframe first on Quantity and second on Cost. import pandas as pd import numpy as np d = {'Product':['Apple','Pear','Banana','Grapes'],\	2

	'Quantity':[100,100,200,250],\ 'Cost':[1000,1500,1200,900]} df = pd.DataFrame(d) df1 = _____ print(df1) **Product Quantity Cost** **0 Apple 100 1000** **1 Pear 100 1500** **2 Banana 200 1200** **3 Grapes 250 900** **OR** For the given code fill in the blanks so that we get the desired output with maximum value for Quantity and Average Value for Cost: import pandas as pd import numpy as np d = {'Product':['Apple','Pear','Banana','Grapes'],\ 'Quantity':[100,150,200,250],\ 'Cost':[1000,1500,1200,900]} df = pd.DataFrame(d) df1 =_____ print(df1) **Quantity 250.0** **Cost 1150.0** **dtype: float64**	
b)	What is the use of pipe() function?	1
c)	Consider the ndarrays Arr1 and Arr2 . Arr1= array([[0,1,2], [3,4,5], [6,7,8]]) Arr2= array([[10,20,30], [40,50,60], [70,80,90]]) What will be the resultant array, if the following statement is executed? **np.hstack((Arr2,Arr1))**	2
d)	Write python statement to create a one –dimensional array using arrange() function .Elements will be in the range 10 to 30 with a step of 4 (including both 10 and 30). Reshape this one-dimensional array to two dimensional array of shape(2,3). Then display only those elements of this two –dimensional array which are divisible by 5.	2

e)	Find O/P for the following program code: import pandas as pd df1=pd.DataFrame({'Icecream':['Vanila','ButterScotch','Caramel'] , 'Cookies':['Goodday','Britannia', 'Oreo']}) df2=pd.DataFrame({'Chocolate':['Dairy Milk','Kitkat'],'Icecream':['Vanila','ButterScotch'],'Cookies':['Hide and Seek','Britannia']}) df2.reindex_like(df1)	2
f)	Consider the following dataframes : df1 mark1 mark2 0 10 15 1 40 45 2 15 30 3 40 70 df2 mark1 mark2 0 30 20 1 20 25 2 20 30 3 50 30 Write the commands to do the following operations on the dataframes given above : (i) To rename column mark1 as Score1 in both the dataframes df1 and df2. (ii) To change index label of df1 from 0 to zero and from 1 to one.	2
g)	**What will be the output of the following code:** import matplotlib.pyplot as p x=[6,7,8,9,10] y=[60,40,55,30,70] p.title('Secondary Class Strength') p.xlabel('Class') p.ylabel('No. of students') p.bar(x,y) p.show() OR **Fill in the blank with appropriate pyplot methods:** import matplotlib.pyplot as p Year=[2000,2002,2004,2006] Rate=[21.0,20.7,21.2,21.6] _____ **# To draw a line graph** p.xlabel('Year') p.ylabel('Rate') p.title('Fuel Rates in every Two Year') _____(“Graph1.pdf”) **# To save the graph** p.show() **What will be the output of the following code:**	2
h)	Write a python program to draw a bar chart with the following information: City | pollution Kolkata | 78	4

	<table><tr><td>Delhi</td><td>91</td></tr><tr><td>Kanpur</td><td>88</td></tr><tr><td>Patna</td><td>90</td></tr><tr><td>Banglore</td><td>82</td></tr></table> The barchart should have the following features: a) X-axis label should be City and Y-axis label should be Pollution b) The title of the chart should be Pollution Index c) The colour of the bars should be Red Use proper import statements in the program. **OR** Write a python program to draw a histogram with following information: <table><tr><td>10</td><td>15</td><td>10</td><td>10</td><td>10</td><td>15</td><td>20</td><td>20</td><td>20</td><td>20</td><td>20</td><td>25</td><td>25</td></tr></table> The histogram should have following information a) X-axis label should be score and Y-axis should be Frequency b) The title should be Frequency of Score c) The colour of histogram should be blue with 10 bins Use proper import statements in the program	
SECTION- B		
3.		
a)	What is meant by Software Engineering?	1
b)	What is Software process? Mention two advantages and two disadvantages of Waterfall model. **OR** Draw labelled diagram of Evolutionary Software process model	3
c)	Mention two advantages of Incremental Software Delivery model. **OR** Mention two advantages of Spiral delivery model.	2
4.		
a)	“Working in a pair in Pair Programming increases efficiency and reduces time”. Justify.	1
b)	Who is responsible for making sure that the Scrum has been understood and enacted and also presides over the Scrum meeting?	1
c)	What are Commit – Update in version control system Or What are Push-Pull requests in version control system	2
d)	Draw a business use case diagram of the following scenario for a grocery shop	3

	i) Customers can purchase goods ii) Shop owner performs billing iii) Inventory is updated after each transaction	
e)	Mention any two features of GIT. OR Who are actors in a Use-case diagram? Name the CRUD operations required in creating Use-case diagrams.	2
SECTION- C		
5.		
a)	Write Django command to create a project with name ' IP' **OR** Write command to run the Django server.	2
b)	Mention two differences between GET and POST methods **OR** Write the method used to read a CSV file. Which command is used to activate virtual environment.	2
c)	Mention one difference between fetchone() and fetchall() method.	1
d)	The 'STUDENT' table is stored in the database 'SCHOOL' in MySQL. The database credentials includes host as 'localhost', user as 'root' and password as 'cloud'. Write python script to do the following: i. Import necessary modules to establish MySQL connectivity with Python ii. Write a statement to establish connection to the database using given credentials iii. Check the connectivity, whether connection OK or NOT OK. iv. Write python statement to create a cursor object v. Write python statement to close the connection	4
6.		
a)	i) State one difference between having and where clause. ii) "Pay" is a column name for the Pay of staff in a table "Schools". The SQL queries **SELECT count(*) FROM Schools;** and **SELECT count(Pay) FROM Schools;** The outputs obtained are 40 and 39 in both the queries respectively. What is the reason behind different output?	1 1
b)	Consider the table TEACHER given below. Write commands in SQL for (i) to (iii) and output for (iv) to (v) . Note: *Hiredate is in mm/dd/yyyy format*	

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	08/1/1990	PRT	F	22000	
6	Pritam	Math	03/17/1980	PRT	F	21000	
7	RajKumar	Science	09/2/1994	TGT	M	27000	
8	Sital	Math	11/17/1980	TGT	F	24500	

i. To display all information about teachers of Female PGT Teachers. 1

ii. To list names, departments and date of hiring of all the teachers in descending order of date of joining. 1

iii. To count the number of teachers and sum of their salary department wise. 1

iv. SELECT MAX(Hiredate) ,Gender FROM Teacher group by Gender; ½

v. SELECT COUNT(DISTINCT(Department)) FROM Teacher; ½

SECTION- D

7.		
a)	Which of the following is NOT an intellectual property? (i) A poem written by a poet (ii) An original painting made by a painter (iii) Trademark of a Company (iv) A remixed song	1
b)	Fill in the blanks: An act of stealing others Intellectual Property without their consent of without citing the source is called _____ **OR** Name the cyber law enforced in India to provide legal recognition to electronic commerce and to facilitate filing of electronic records with the Government._____	1
c)	Give the full form of: i) GPL ii) OSS	1
d)	Mention two benefits of e-waste recycling.	1
e)	Suggest two measures to avoid Credit Card Fraud.	2
f)	Differentiate between Public Domain Software and Proprietary Software.	2
g)	Bit-coin is a kind of _____	1
h)	List any one disability issue faced in the using computers with respect to specially abled students.	1

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KENDRIYA VIDYALAYA SANGATHAN- KOLKATA REGION

PREBOARD-1 EXAMINATION (2019-20) – THEORY

MARKING SCHEME

INFORMATICS PRACTICES NEW (065) - CLASS XII

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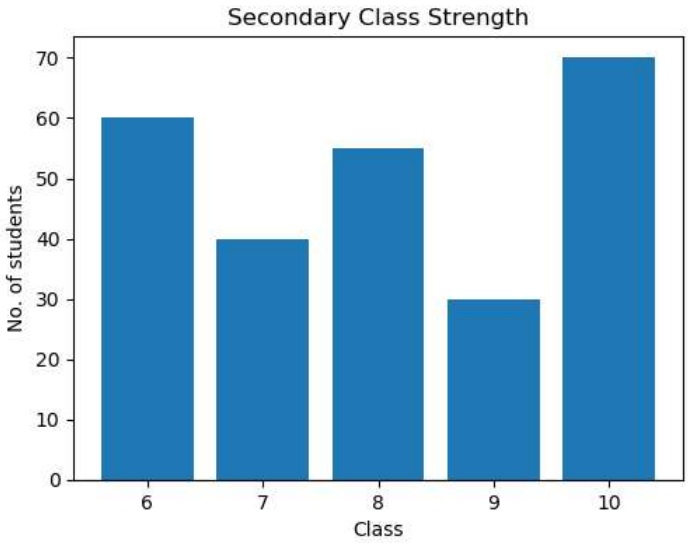
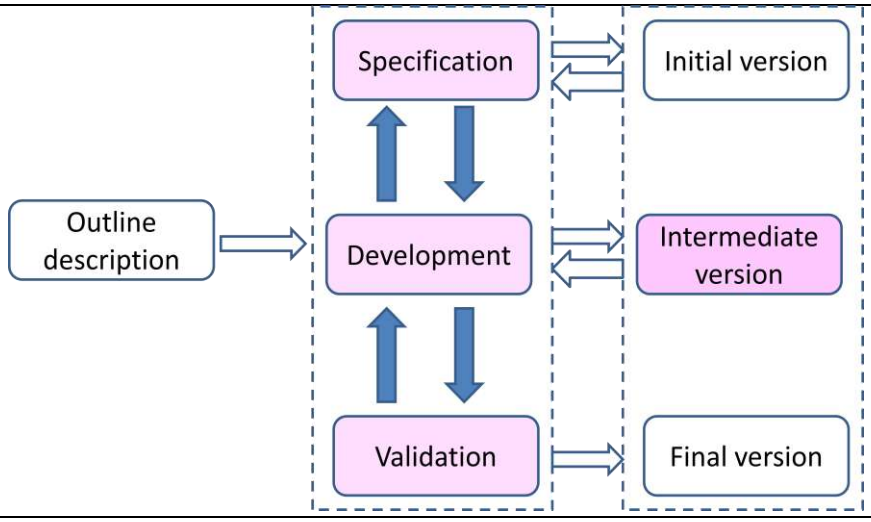
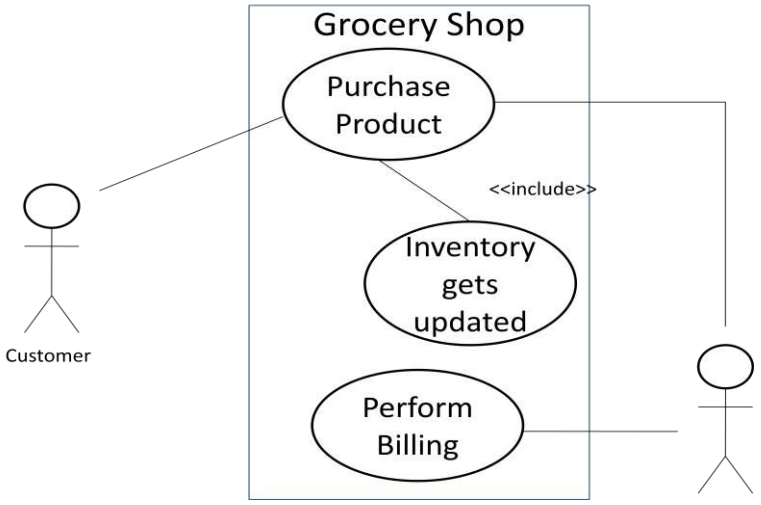
SECTION-A		
1.		
(a)	[30 40 50 60 70]	1
(b)	• Memory consumption is lesser in Numpy as compared to List • Numpy is faster in execution as compared to List • Numpy supports vectorized operations whereas List does not. • Numpy works with homogeneous elements whereas List can work with heterogeneous elements • Once created size of Numpy array cannot be changed whereas Size can be changed in a List even after creation **(Any two differences) Each difference carries ½ mark**	1
(c)	np.cov(A,B) # COVARIANCE np.corrcoef(A,B) # CORRELATION COEFFICIENT	2

(d)	House Blue Red Student Ali 120.0 NaN Tom NaN 140.0	2
(e)	i) a[0] or a[0,:] **1 mark** ii) a[:,1] or a[0:3,1] **1 mark** **Any other correct answer can be given marks.**	2
(f)	df1 = df.apply(np.sum)	2
g)	**Import numpy as np** **Arr=np.ones([4,3],dType=np.int64)**	1
h)	apply() is a series function, so it applies the given function to one row or one columnof the dataframe(as single row/column of a dataframe is equivalent to a series); applymap() is an element function, so it applies the given function to each individual element, separately- without taking into account other elements. **OR** Marks1 Marks2 0 10 50 1 20 70 2 30 60 3 40 80 Marks1 Marks2 0 10 50 1 30 120 2 60 180 3 100 260	2
2.		
a)	df1 = df.sort_values(['Quantity','Cost']) OR df1=df.agg({'Quantity':np.max,'Cost':np.mean}) **(2 marks for correct answer.Partial marks can be awarded for identifying correct methods)**	2
b)	Pipe() function helps in chaining of function in the order they are executed. **(1 mark for correct answer)** **Marks can be given for any proper satisfactory answer.**	1
c)	[[10 20 30 0 1 2] [40 50 60 3 4 5] [70 80 90 6 7 8]] **(2 mark for correct answer)**	2

d)	import numpy as np p=np.arange(10,31,4) a=p.reshape(2,3) b=np.extract(np.mod(a,5)==0,a) print(b)	2
e)	Icecream Cookies 0 Vanila Hide and Seek 1 ButterScotch Britannia 2 NaN NaN Full marks for correct output 1 mark if any one line is correct ,1 and ½ marks if any two lines are correct.	2
f)	(i) df1.rename(columns={'mark1':'marks1'}, inplace=True) (ii) df1.rename(index = {0: "zero", 1:"one"}, inplace = True)	2
g)	 OR **p.plot(Year,Rate)** **p.savefig**("Graph1.pdf")	2
h)	import matplotlib.pyplot as plt import numpy as np city = np.array(['Kolkata','Delhi','Kanpur','Patna','Bangalore']) pollution = np.array([78,91,88,90,82]) plt.xlabel('City') plt.ylabel('Pollution') plt.title('Pollution Index') plt.bar(city,pollution, color='red') plt.show() **½ mark for import, ½ each for declaring two arrays or lists** **½ mark each for xlabel, ylabel and title** **½ mark for plt.bar() function with correct parameters**	4

	½ mark for show function **OR** import matplotlib.pyplot as plt import numpy as np arr = np.array([10,15,10,10,10,15,20,20,20,20,20,25,25]) plt.xlabel('Score') plt.ylabel('Frequency') plt.title('Frequency of Score') plt.hist(arr, color='blue',bins=10) plt.show() **½ mark for import, ½ for declaring array or list** **½ mark each for xlabel, ylabel and title** **1 mark for plt.hist() function with correct parameters** **½ mark for show function**	
SECTION-B		
3.		
a)	**1 mark for proper definition of Software Engineering**	1
b)	Software process is defined as the structured set of activities that are required to develop the software system. Advantages of Waterfall Model: i) Allows separate schedules and eadlines for each department. ii) Easy to understand model iii) Easy to manage model iv) Not a complex model Disadvantages of Waterfall model: i) No estimation of time and cost ii) Difficult to incorporate changes iii) Not for complex systems **1 marks for proper definition of Software process.** **Any two Advantages of Waterfall model- ½ mark for one advantage** **Any two Disadvantages of Waterfall model- ½ mark for one disadvantage** **OR** **<u>EVOLUTIONARY PROCESS MODEL</u>**	3

		
c)	i) Generates working software quickly ii) More flexible iii) Easier to test and debug iv) Lower risk of overall project failure **OR** i) Good for large and mission critical projects ii) High amount of risk analysis hence, avoidance of risk is enhanced iii) Additional functionality can be added at a later date iv) Highly customized products can be developed	2
4.		
a)	**1 mark for proper justification**	1
b)	Scrum Master	1
c)	Commit – When the changes in the working copy of software is permanently saved in the repository Update – Making changes in the local copy of the software. **OR** Push – Sending committed changes in the Global repository Pull – Updating local repository by pulling the changes available in global repository	2
d)		3

e)	i) Automatic Backup of whole repository ii) Maintains full history of changes iii) Allows offline Repository access iv) Efficient Algorithm **(Any two feature . Each feature carries 1 mark.)** **OR** An actor is a person,organization,or external system that plays a role in one or more interactions with the system. **(1 mark)** CRUD- Create ,Read,Update,Delete **(1 mark)** **Partial marking-> ½ marks for any two operations**	2
	SECTION-C	
5.		
a)	django-admin startproject IP **OR** python manage.py runserver	2
b)	GET is used to request data from a specified resource GET request remain in browser history GET request have size restriction GET request should not be used for sending sensitive information POST request is used to send data to a server to create or modify a resource POST request do not remain in browser history POST request have no length restriction POST request in not visible in the HTTP header **(1 mark for one correct difference)** **OR** read_csv() **(1mark)** virtualenv **(1mark)**	2
c)	fetchone() is used to fetch/get only one record from the table/SQL Query whereas fetchall() is used to get all records from the table/SQL query.	1
d)	import msql.connector as mc **½ mark** con = mc.connect(host='localhost', user='root', passwd='cloud', database='SCHOOL') **1 mark** if con.is_connected()==True: **½ mark** print("Connection OK") **½ mark** else: print("Connection NOT OK") **½ mark for else and print statement** my_cur = con.cursor() **½ mark** con.close() **½ mark**	4
6.		

a)	i)WHERE conditions are applicable on individual rows whereas HAVING conditions are applicable on groups as formed by GROUP BY clause. ii) The reason behind different output is count(*) includes NULL value whereas count(PAY) excludes NULL value while counting.	1 1
b)	i. Select * from Teacher where Category= "PGT" and Gender='F'; ii. Select Name, Department, Hiredate from Teacher order by Hiredate desc; iii. Select count(*), sum(salary) from Teacher group by Department; iv. MAX(Hiredate) Gender 03/17/1994 F 09/2/1994 M v. COUNT(DISTINCT(Department)) 6	1 1 1 ½ ½
	SECTION-D	
7.		
a)	A remixed song	1
b)	Plagiarism OR IT Act 2000 / IT Amendment Act 2008	1
c)	i) General Public License ii) Open Source Software **(½ mark for each)**	1
d)	i) Allows recovery of precious metals ii) Protects public health iii) Creates jobs iv) Conserving landfill space **(½ marks for each benefit) (1 mark for any two benefits)**	1
e)	i) Never disclose your Credit Card Number and CVV Number and PIN Numbers to anybody. ii) Never disclose your AADHAR or PAN number during online purchases Or any other proper measure is allowed. **(1 mark for each measure)**	2
f)	**Public Domain Software: -** 1) It is free and can be used without restriction 2) It is outside the scope of copyright and licensing. **Proprietary Software: -** 1) It is neither free nor available for public 2) It has a proper license and user has to buy that license in order to use it. **(At least two points of difference where each point carries 1 mark or any proper supporting satisfactory answer can be given full marks)**	2
g)	Crypto-currency	1
h)	1) Unavailability of Teachers Materials/Aids 2) Lack of Special Needs Teachers 3) Lack of Supporting Curriculum	1

	(Any one disability issue– 1 mark)	

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