

Kendriya Vidyalaya Sangathan, Jaipur Region
Pre Board Examination (2019-20)
Class - XII
Subject : Informatics Practices-New(065)

Max Marks :70

Time : 3 hrs

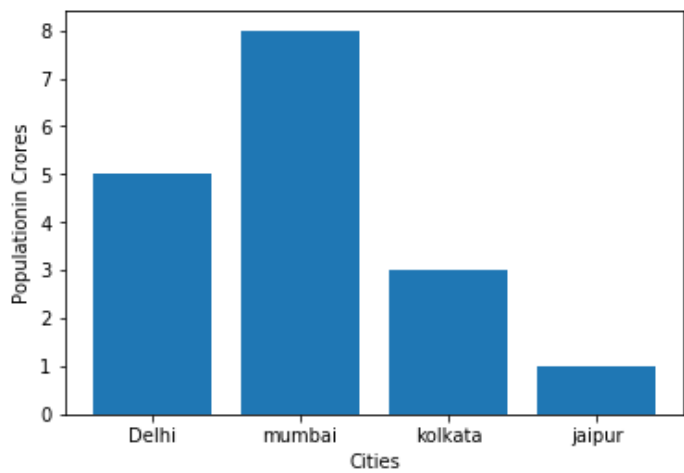
General Instructions:

- All questions are compulsory
- Programming language used - Python
- 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

Answer the following questions.

Q.1	a	Find the output of the following program. <pre>import numpy as np X=np.array([1,2,3]) Y=np.array([[9,8,7], [6,5,4]]) Z=np.vstack([X,Y]) print(Z)</pre>	1
	b	Find the output of the following program. <pre>import numpy as np d=np.array([10,20,30,40,50,60,70]) print(d[-4:-1])</pre>	1
	c	<p>Department of communication wants to plot a bar graph for the given set of values of cities on x-axis and number of users on y-axis.</p> <p>Complete the code to perform the following :</p> <p>(i) To plot the bar graph in statement 1</p> <p>(ii) To display the graph in statement 2</p> <pre>import matplotlib.pyplot as plt cities=['Delhi','Mumbai','Bangalore','Jaipur'] users=[100000,150000,110000,70000] Statement1 plt.xlabel('cities') plt.ylabel('users') Statement2</pre> <p style="text-align: center;">OR</p> <p>Alexa wants to draw a line chart using a list of elements named LIST.</p> <p>Complete the code to perform the following operations:</p> <p>(i) To plot a line chart using the given LIST,</p> <p>(ii) To give a y-axis label to the line chart named "Sample Numbers".</p>	1

		<pre>import matplotlib.pyplot as plt LIST=[10,20,30,40,50,60]</pre> <p>_____ Statement 1 _____ Statement 2</p> <pre>plt.show()</pre>											
	d	<pre>import numpy as np array1=np.array([10,12,14,16,18,20,22]) array2=np.array([10,12,15,16,12,20,12]) a=(np.where(array1!=array2)) print(array1[a])</pre>	2										
	e	<p>Write a code to plot the bar graph given below:</p>  <table border="1"> <caption>Population in Crores by City</caption> <thead> <tr> <th>City</th> <th>Population (Crores)</th> </tr> </thead> <tbody> <tr> <td>Delhi</td> <td>5</td> </tr> <tr> <td>Mumbai</td> <td>8</td> </tr> <tr> <td>Kolkata</td> <td>3</td> </tr> <tr> <td>Jaipur</td> <td>1</td> </tr> </tbody> </table>	City	Population (Crores)	Delhi	5	Mumbai	8	Kolkata	3	Jaipur	1	2
City	Population (Crores)												
Delhi	5												
Mumbai	8												
Kolkata	3												
Jaipur	1												
	f	What is data visualization? What is its significance?	2										
	g	<p>Write a NumPy program to compute covariance of the two given arrays.</p> <p>Original Array1: [0 1 2]</p> <p>Original Array2: [2 4 5]</p> <p>Covariance of the said arrays: [1 1.5] [1.5 2.33333333]</p> <p style="text-align: center;">OR</p> <p>Write a NumPy program to create a 3x3 identity matrix, i.e. diagonal elements are 1, the rest are 0. Replace all 0 to random number from 10 to 20.</p>	3										
Answer the following Questions :-													
Q.2	a	<p>Which method in Pandas can be used to change the index of rows and columns of a Series or Dataframe :</p> <p>(i) rename() (ii) reindex() (iii) reframe() (iv) none of the above</p>	1										
	b	<p>Write a Python code to create an empty dataframe.</p> <p style="text-align: center;">OR</p> <p>Write the command using Insert() function to add a new column in the last place(3rd place) named "Salary" from the list Sal=[10000,15000,20000] in an existing data frame named EMP already having 2 columns.</p>	1										
	c	<p>Consider the following python code and write the output for statement S1</p> <pre>import pandas as pd K=pd.series([2,4,6,8,10,12,14]) K.quantile([0.50,0.75]) ----- S1</pre>	1										

d	Write a small python code to drop a row from dataframe labeled as 1.	1																								
e	What is Pivoting? How is pivot_table() different from pivot()when both perform pivoting?	2																								
f	<p>A dataframe df stores data about passangers, flights and years. First few rows of dataframe are shown below.</p> <table border="1"> <thead> <tr> <th></th> <th>Year</th> <th>Month</th> <th>Passenger</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>2009</td> <td>January</td> <td>120</td> </tr> <tr> <td>1</td> <td>2009</td> <td>February</td> <td>125</td> </tr> <tr> <td>2</td> <td>2009</td> <td>March</td> <td>130</td> </tr> <tr> <td>3</td> <td>2009</td> <td>April</td> <td>128</td> </tr> <tr> <td>4</td> <td>2009</td> <td>May</td> <td>124</td> </tr> </tbody> </table> <p>Using above dataframe, write commands for the following:</p> <ol style="list-style-type: none"> Compute total passenger per year. Compute average passenger per month. <p style="text-align: center;">OR</p> <p>Write a python code to create a dataframe with appropriate headings from the list given below :</p> <p>['301', 'English', 70], ['065', 'IP', 80], ['083', 'CS', 75]</p>		Year	Month	Passenger	0	2009	January	120	1	2009	February	125	2	2009	March	130	3	2009	April	128	4	2009	May	124	2
	Year	Month	Passenger																							
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g	<p>Given a dataframe namely data as shown in figure (fruit names are row labels).</p> <table border="1"> <thead> <tr> <th></th> <th>Color</th> <th>Count</th> <th>Price</th> </tr> </thead> <tbody> <tr> <td>Apple</td> <td>Red</td> <td>3</td> <td>120</td> </tr> <tr> <td>Apple</td> <td>Green</td> <td>9</td> <td>110</td> </tr> <tr> <td>Pear</td> <td>Red</td> <td>25</td> <td>125</td> </tr> <tr> <td>Pear</td> <td>Green</td> <td>26</td> <td>150</td> </tr> <tr> <td>Lime</td> <td>Green</td> <td>99</td> <td>70</td> </tr> </tbody> </table> <p>Write code statement to-</p> <ol style="list-style-type: none"> Find all rows with label "Apple". Extract all columns List only the columns Count and price using loc. List only rows with lables 'Apple' and 'Pear' using loc. <p style="text-align: center;">OR</p> <p>Consider the following dataframe, and answer the questions given below:</p> <pre>import pandas as pd df = pd.DataFrame({"Q1": [200, 400, 500, 440, 1000], "Q2": [580, 250, 540, 300, 290], "Q3": [2000, 1600, 700, 360, 820], "Q4": [140, 370, 170, 200, 600]})</pre> <p>(i) Write the code to find mean value from above dataframe df over the index and column axis. (Skip NaN value)</p> <p>(ii) Use sum() function to find the sum of all the values over the index axis.</p> <p>(iii) Find the median of the dataframe df.</p>		Color	Count	Price	Apple	Red	3	120	Apple	Green	9	110	Pear	Red	25	125	Pear	Green	26	150	Lime	Green	99	70	3
	Color	Count	Price																							
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Apple	Green	9	110																							
Pear	Red	25	125																							
Pear	Green	26	150																							
Lime	Green	99	70																							
h	<p>Find output of the following code:-</p> <pre>import pandas as pd data=[{'a':1,'b':2},{'a1':5,'b':10,'c1':20}] #with two column indices, values same as dictionary keys df1=pd.DataFrame(data, index=['first','second'], columns=['a','b']) #with two column indices with one index with other name df2=pd.DataFrame(data,index=['first','second'],columns=['a','b1']) print(df1) print(df2)</pre>	3																								

i	Write the code in pandas to create the following dataframes :		4																													
	df1	df2																														
	<table border="1"> <thead> <tr> <th></th> <th>Qt1</th> <th>Qt2</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>10</td> <td>100</td> </tr> <tr> <td>1</td> <td>20</td> <td>200</td> </tr> <tr> <td>2</td> <td>30</td> <td>300</td> </tr> <tr> <td>3</td> <td>40</td> <td>400</td> </tr> </tbody> </table>		Qt1	Qt2	0	10	100	1	20	200	2	30	300	3	40	400	<table border="1"> <thead> <tr> <th></th> <th>Qt1</th> <th>Qt2</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>10</td> <td>100</td> </tr> <tr> <td>1</td> <td>20</td> <td>200</td> </tr> <tr> <td>2</td> <td>30</td> <td>300</td> </tr> <tr> <td>3</td> <td>40</td> <td>400</td> </tr> </tbody> </table>		Qt1	Qt2	0	10	100	1	20	200	2	30	300	3	40	400
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Write the commands to do the following operations on the dataframes given above:																																
(i) To add dataframes df1 and df2.																																
(ii) To subtract df2 from df1																																
(iii) To rename column mark1 as marks1 in both the dataframes df1 and df2.																																
(iv) To change index label of df1 from 0 to zero and from 1 to one.																																

Section – B

Answer the following Questions:-

Q.3	a	What is the need of Software Engineering?	1
	b	Why is 'Scalability' is important factor in software development?	1
	c	Write down any one benefit of pair programming.	1
	d	List any two differences between Incremental model and Spiral model in developing complex software projects. OR In the Scrum process, a ScrumMaster differs from a traditional project manager. Justify the statement.	2
	e	Explain waterfall model. What are its advantage and disadvantages? Write down any one situation where waterfall software process can be used. OR What is spiral model? What are the advantages and disadvantages of spiral model? Write down any one situation where waterfall software process can be used.	3
	f	What are version control systems? What are the version control systems? Differentiate between Commit/Update and Pull/Push request?	3
	g	Draw a use case diagram showing an ATM system. Identify actor, use-case and relationship from ATM use case diagram. OR Draw a use case diagram for a Taxi Booking app. Identify actor, use-case and relationship from ATM use case diagram.	4

Section –C

Q.4	a	Write the Django command to start a new app named 'users' in an existing project?	1
	b	What is difference between group by and order by clause of MySQL.	1
	c	NULL value means : (i) 0 value (ii) 1 value (iii) None value (iv) None of the above	1
	d	What is CSV?	1
	e	What is the use of is_connected() function in MYSQL.	1
	f	Differentiate between the following: i. Alter and Update command ii. Where and having clause iii. DDL and DML command	3

g	<p>Observe the following table and answer the given questions:</p> <p>Table:Product</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Pno</th> <th style="width: 20%;">Name</th> <th style="width: 15%;">Qty</th> <th style="width: 50%;">PurchaseDate</th> </tr> </thead> <tbody> <tr> <td>101</td> <td>Pen</td> <td>102</td> <td>12-12-2011</td> </tr> <tr> <td>102</td> <td>Pencil</td> <td>201</td> <td>21-02-2013</td> </tr> <tr> <td>103</td> <td>Eraser</td> <td>90</td> <td>09-08-2010</td> </tr> <tr> <td>109</td> <td>Sharpener</td> <td>90</td> <td>31-08-2012</td> </tr> <tr> <td>113</td> <td>Clips</td> <td>900</td> <td>12-12-2011</td> </tr> </tbody> </table> <p>i. Write the names of most appropriate columns, which can be considered as candidate keys.</p> <p>ii. What is the degree and cardinality of the above table?</p> <p>iii. <code>SELECT MAX(Qty) FROM PRODUCT;</code></p>	Pno	Name	Qty	PurchaseDate	101	Pen	102	12-12-2011	102	Pencil	201	21-02-2013	103	Eraser	90	09-08-2010	109	Sharpener	90	31-08-2012	113	Clips	900	12-12-2011	3
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h	<p>Consider the following table Teacher and Write commands in SQL for (i) to (iv) and output for (v) and (vi).</p> <p style="text-align: center;">Teacher</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 5%;">ID</th> <th style="width: 20%;">NAME</th> <th style="width: 15%;">DEPARTMENT</th> <th style="width: 15%;">Hiredate</th> <th style="width: 10%;">CATEGORY</th> <th style="width: 5%;">GENDER</th> <th style="width: 40%;">SALARY</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Tanya Nanda</td> <td>SocialStudies</td> <td>1994-03-17</td> <td>TGT</td> <td>F</td> <td>25000</td> </tr> <tr> <td>2</td> <td>Saurabh Sharma</td> <td>Art</td> <td>1990-02-12</td> <td>PRT</td> <td>M</td> <td>20000</td> </tr> <tr> <td>3</td> <td>Nandita Arora</td> <td>English</td> <td>1980-05-16</td> <td>PGT</td> <td>F</td> <td>30000</td> </tr> <tr> <td>4</td> <td>James Jacob</td> <td>English</td> <td>1989-10-16</td> <td>TGT</td> <td>M</td> <td>25000</td> </tr> <tr> <td>5</td> <td>Jaspreet Kaur</td> <td>Hindi</td> <td>1990-08-01</td> <td>PRT</td> <td>F</td> <td>22000</td> </tr> <tr> <td>6</td> <td>Disha Sehgal</td> <td>Math</td> <td>1980-03-17</td> <td>PRT</td> <td>F</td> <td>21000</td> </tr> <tr> <td>8</td> <td>Sonali Mukherjee</td> <td>Math</td> <td>1980-11-17</td> <td>TGT</td> <td>F</td> <td>24500</td> </tr> </tbody> </table> <p>(i) To display all information about teacher of PGT category.</p> <p>(ii) To list the names of female teachers of Hindi department.</p> <p>(iii) To list names, departments and date of hiring of all the teachers in ascending order of date of joining.</p> <p>(iv) <code>SELECT COUNT(*) FROM TEACHER WHERE Category='PGT';</code></p> <p>(v) <code>SELECT AVG(salary) FROM TEACHER GROUP BY gender;</code></p> <p style="text-align: center;">OR</p> <p>(i) In a Office, a database named “emprecord” is created in mysql whose password is “1@2@3@4@5”. Shreya is trying to add a new record of an employee having details (5,'Shalini','Delhi') in a “emp” table.</p> <p>(ii) Write the code in python to read the contents of “details.csv” file consisting of data from a mysql table and print the data of the table on the screen in tabular form of the table.</p>	ID	NAME	DEPARTMENT	Hiredate	CATEGORY	GENDER	SALARY	1	Tanya Nanda	SocialStudies	1994-03-17	TGT	F	25000	2	Saurabh Sharma	Art	1990-02-12	PRT	M	20000	3	Nandita Arora	English	1980-05-16	PGT	F	30000	4	James Jacob	English	1989-10-16	TGT	M	25000	5	Jaspreet Kaur	Hindi	1990-08-01	PRT	F	22000	6	Disha Sehgal	Math	1980-03-17	PRT	F	21000	8	Sonali Mukherjee	Math	1980-11-17	TGT	F	24500	4
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Section – D

Answer the following Questions

Q.5	a	<p>Which of the following is not an intellectual property?</p> <p>(i) A poem written by a poet</p> <p>(ii) An original painting made by a painter</p> <p>(iii) Trademark of a Company</p> <p>(iv) A remixed song</p>	1
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b	Which of the following come under cybercrime? i. Theft of a brand new sealed laptop ii. Access to a bank account for an unauthorized money transaction iii. Modification in a company's data with unauthorized access iv. Photocopy of printed material	1
c	If someone hacks your email account, who would you complain to?	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 posting negative, demeaning comments on her social networking profile, college site's forum, etc. She is also getting 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?	2
e	What are the different types of ICT tools to assist people with learning disabilities?	2
f	Explain the following terms: i. online campaigns ii. Crowdsourcing iii. Smart mobs OR What do you understand with E-Waste Management System? What are the best ways to dispose the used electronic gadgets.	3