

**KENDRIYA VIDYALAYA SANGATHAN, REGIONAL OFFICE, BHOPAL**

**1<sup>st</sup> Pre-Board EXAMINATION 2019 – 20**

**CLASS – XII**

**SET-B**

**SUBJECT: INFORMATICS PRACTICES (065)**

**Marking Scheme**

*Time Allowed: 3 Hours*

*Maximum Marks: 70*

**General Instructions:**

- All questions are compulsory
- Question has internal choices.
- Question Paper is divided into 4 sections A, B, C and D.
- Please check that this question paper contains 5 questions.
- Each Section has one question except Section A. Section A comprises of questions(1 and 2)
- Answer the questions after carefully reading the text.

<b>SECTION – A</b>			
1.	(a)	Explain dataframe. Can it be considered as 1D Array or 2D Array?	1
	Ans.	Dataframe is a 2-Dimensional Array with heterogeneous data usually represented in a tabular format. It can be considered as 2D Array.	
	(b)	How can we check if a dataframe has any missing values?	1
	Ans.	df.isnull values.any()	
	(c)	Give the output for the above statement. a = pd.DataFrame([1, 1, 1, np.nan], index=['a', 'b', 'c', 'd'], columns=['one'])	1
	Ans.	one a    1.0 b    1.0 c    1.0 d    NaN	
	(d)	import pandas as pd data = [1,2,3,4,5] df = pd.DataFrame(data) print(df)	1
	Ans.	0 0        1 1        2 2        3 3        4 4        5	
	(e)	What is meant by data aggregation in Pandas? <b>OR</b> The _____ function returns its argument with a modified shape, whereas the _____ method modifies the array itself. (i) reshape,resize (ii) resize,reshape (iii) reshape2,resize	1

		(iv) all of the Mentioned	
	Ans.	Aggregation is the process of turning the values of a dataset (or a subset of it) into one single value or, we can say, data aggregation is a multi-value function which requires multiple values and returns a single value as a result. There are a number of aggregations possible in Pandas like count, sum, min, max, median, quartile, etc.  <b>OR</b> (i) reshape,resize	
	(f)	Write a Python program to display a bar chart of the popularity of programming Languages Data: Programming languages: Java, Python, PHP, JavaScript, C#, C++ Popularity: 22.2, 17.6, 8.8, 8, 7.7, 6.7  <b>OR</b> Write the name of various types of plots offered by matplotlib ?.	2
	Ans.	<pre>import matplotlib.pyplot as plt x = ['Java', 'Python', 'PHP', 'JavaScript', 'C#', 'C++'] popularity = [22.2, 17.6, 8.8, 8, 7.7, 6.7] x_pos = [i for i, _ in enumerate(x)] plt.bar(x_pos, popularity, color='blue') plt.xlabel("Languages") plt.ylabel("Popularity") plt.title("Popularity of Programming Language\n" + "Worldwide, Oct 2017 compared to a year ago") plt.xticks(x_pos, x) # Turn on the grid plt.minorticks_on() plt.grid(which='major', linestyle='-', linewidth='0.5', color='red') # Customize the minor grid plt.grid(which='minor', linestyle=':', linewidth='0.5', color='black') plt.show()</pre> <b>OR</b> Matplotlib offers several types of plots:- Line Graph Bar graph Histogram Scatter Plot Area Plot Pie Chart	
2.	(a)	What is another name for numpy? In numpy, what are dimensions called?	1
	Ans.	ND ARRAY and AXES	
	(b)	Name any two functions of numpy module to create numpy array.	2
	Ans.	zeros(), ones(), empty(), arrange()	
	(c)	Differentiate between series data structure and DataFrame data structure?  <b>OR</b> What is pivoting? Which function of Pandas support pivoting ?.	3
	Ans.	A series is a one-dimensional object that can hold any data type such as	

	<p>integers, floats and strings. It has only one axis. A dataframe is a two-dimensional object that can hold different data types. Individual columns of a dataframe can act as a separate series object.</p> <p style="text-align: center;"><b>OR</b></p> <p>Data pivoting is a summarizing technique to rearrange the columns and rows in report so as to view data from different perspectives. Pandas library makes available two functions for pivoting -&gt; pivot (), pivot_table() functions.</p>																									
(d)	Explain Matplotlib.	1																								
Ans.	Matplotlib is a Python 2D plotting library which produces publication quality figures in a variety of hard copy formats and interactive environments across platforms.																									
(e)	<p>A dataframe df stores data about passengers, flights and years. The first few rows of the dataframe are shown below:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>Year</th> <th>Month</th> <th>Passengers</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Soap</td> <td>50</td> <td>112</td> </tr> <tr> <td>1</td> <td>Powder</td> <td>100</td> <td>118</td> </tr> <tr> <td>2</td> <td>Face cream</td> <td>150</td> <td>132</td> </tr> <tr> <td>3</td> <td>Pen</td> <td>50</td> <td>129</td> </tr> <tr> <td>4</td> <td>Soap box</td> <td>20</td> <td>121</td> </tr> </tbody> </table> <p>Using the above dataframe, write commands for the following: (i) Compute total passengers per year. (ii) Compute average passengers per month.</p>		Year	Month	Passengers	0	Soap	50	112	1	Powder	100	118	2	Face cream	150	132	3	Pen	50	129	4	Soap box	20	121	4
	Year	Month	Passengers																							
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2	Face cream	150	132																							
3	Pen	50	129																							
4	Soap box	20	121																							
Ans.	<p>(i) <code>fdf.pivot_table(index='year', value='passengers', aggfunc='sum')</code> (ii) <code>fdf.pivot_table(index='month', values='passengers', aggfunc='mean')</code></p>																									
(f)	<p>Write the output of the following code.</p> <pre>import numpy as np a = np.array([1, 2, 3]) print(type(a)) print(a.shape) print(a[0], a[1], a[2]) a[0] = 5 print(a) b = np.array([[1,2,3],[4,5,6]]) print(b.shape) print(b[0, 0], b[0, 1], b[1, 0])</pre> <p style="text-align: center;"><b>OR</b></p> <p>Write a Python program to create a Boolean array. Like ( [ True ,True ,True],  [ True ,True ,True],  [ True ,True ,True],)</p>	2																								
Ans.	<pre>&lt;class 'numpy.ndarray'&gt; (3,) 1 2 3 [5 2 3] (2, 3) 1 2 4</pre> <p style="text-align: center;"><b>OR</b></p>																									

	<pre>import numpy as np np.full((3,3),True, dtype=bool) array([[ True, True, True],        [ True, True, True],        [ True, True, True]], dtype=bool) <b>Other Method:-</b> np.ones((3,3) dtype=bool)</pre>	
(g)	<p>Give the output for the following code.</p> <pre>import pandas as pd data = [{'a': 1, 'b': 2},{'a': 5, 'b': 10, 'c': 20}] #With two column indices, values same as dictionary key 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>	2
Ans.	<pre>       a      b first  1      2 second 5     10       a      b1 first  1     NaN second 5     NaN</pre>	
(h)	<p>Find the Output:-</p> <pre>d1 = { 5:"number","a":"string",(1,2):"tuple" } print("Dictionary Contents") for x in d1.keys():     print(x , ':' , d1[x], end = ' ')     print(d1[x] * 3) print()</pre>	2
Ans.	<pre>Dictionary Contents 5 : numbernumbernumbernumber a : stringstringstringstring (1, 2) : tupletupletupletuple</pre>	
(i)	<p>Create multiple line chart.s on common plot where 4 data ranges are plotted on same chart. The data ranges to be plotted are: Data=[ [5., 15., 25., 35.], [9., 18., 21., 15.], [2., 18., 10., 30.], [13., 27., 20., 35.] ]</p> <p style="text-align: center;"><b>OR</b></p> <p>Write the name of methods used in pyplot ?.</p>	3
Ans.	<pre>import numpy as np import matplotlib.pyplot as plt Data=[ [5., 15., 25., 35.], [9., 18., 21., 15.], [2., 18., 10., 30.], [13., 27., 20., 35.] ] x=np.arange(4) plt.plot(x, Data[0], color='b', label='Range1') plt.plot(x, Data[1], color='g', label='Range1') plt.plot(x, Data[2], color='r', label='Range1') plt.plot(x, Data[3], color='y', label='Range1') plt.legend(loc='upper left') plt.title("Multirange Line Chart") plt.xlabel('X')</pre>	

		<pre>plt.ylabel('Y')</pre> <pre>plt.show()</pre> <p style="text-align: center;"><b>OR</b></p> <p>Various methods used with pyplot:-</p> <pre>plot()</pre> <pre>show()</pre> <pre>title()</pre> <pre>xlabel()</pre> <pre>ylabel()</pre> <pre>explode()</pre> <pre>bar()</pre> <pre>hist()</pre> <pre>box plot()</pre> <pre>scatter()</pre>	
	(j)	<p>Suppose a data frame contains information about student having columns rollno, name, class and section. Write the code for the following:</p> <p>(i) Add one more column as fee</p> <p>(ii) Write syntax to transpose data frame.</p> <p>(iii) Write python code to delete column fee of data frame.</p> <p>(iv) Write the code to append df2 with df1</p>	3
	Ans.	<p>(i) <code>Df1['fee']=[100,200,300]</code></p> <p>(ii) <code>Df1=Df1.T</code></p> <p>(iii) <code>Df2=Df2.append(Df1)</code></p>	
<b>SECTION – B</b>			
3	(a)	<p>What is Software Development Life Cycle (SDLC)?</p> <p style="text-align: center;"><b>OR</b></p> <p>Why does the need for Software Engineering arise?.</p>	2
	Ans.	<p>Software Development Life Cycle (SDLC) is the overall process of developing information systems through a multi-step process from investigation of initial requirements through analysis, design, implementation and maintenance.</p> <p style="text-align: center;"><b>OR</b></p> <p>(i) The Software conforms to the specification and is error free.</p> <p>(ii) The software is delivered in time.</p> <p>(iii) The software is scalable and adaptable.</p> <p>(iv) That software costs remain within the budget.</p>	
	(b)	<p>Define the terms:</p> <p style="text-align: center;">(i) Agile Methods                      (ii) Agile Process</p>	3
	Ans.	<p>i) Agile Methods: Agile methods are the methods to overcome perceived and actual weakness in conventional software engineering and to accommodate changes in environment, requirements and use cases.</p> <p>(ii) Agile Process: Agile process focuses on team structures, team communications, rapid delivery of software and its de-emphasizes importance of intermediate product.</p>	
	(c)	<p>Which model is best suited for larger projects and organizations and why?</p> <p style="text-align: center;"><b>OR</b></p> <p>What are the main drawbacks of Spiral model ?.</p>	3

	Ans.	WaterFall Model. The reasons are: (i) It adapts to shifting teams; (ii) It forces structured organization	
	(d)	Explain spiral model along with the steps involved and its drawbacks. <b>OR</b> What are the responsibilities of a Scrum Master?	4
	Ans:	<b>(2 Marks for corrected explanation and 2 marks for its drawback)</b> <b>OR</b> <b>(1 marks for each responsibilities maximum any four)</b>	
	(e)	Efficiency in a software product does not include _____ (i) responsiveness (ii) licensing (iii) memory utilization (iv) processing time	1
	Ans.	<b>(ii) licensing</b>	
	(f)	Software is not considered to be collection of executable programming code, associated libraries and documentations is True or False.	1
	Ans.	False	
	(g)	What is the simplest model of software development paradigm? (i) Spiral model (ii) Big Bang model (iii) V-model (iv) Waterfall model	1
	Ans.	<b>(iv) Waterfall model</b>	
<b>SECTION – C</b>			
4	(a)	Is Django a framework? Yes or No?	1
	Ans.	Yes	
	(b)	What is fetchall() method?	1
	Ans.	fetchall() fetches all (remaining) cases from the active dataset or, if there are splits, the remaining cases in the current split. If there are no remaining rows, the result is an empty tuple. Each element in a tuple contains the data value for a specific variable.	
	(c)	Write the command to install mysql connector.	1
	Ans.	pip install mysql - connector	
	(d)	Which SQL keyword is used to retrieve a maximum value ?	1
	Ans.	max()	
	(e)	Which of the following is not a DDL command ? (i) UPDATE (ii) TRUNCATE (iii) ALTER (iv) None of the Mentioned	1
	Ans.	(i) UPDATE	
	(f)	Write the difference between Single-Row Functions and Multiple-Row	3

		Functions in SQL.																																																		
	Ans.	Single row functions perform on individual rows or records and returns the answer either as integer or string. For example, len() and trim(). On the other hand, multiple row functions perform on a range of values and always return the result as a numeric value or number. For example, Aggregate functions like sum(), count(), max(), min() & avg().																																																		
	(g)	Compare Having clause and Order by clause?	3																																																	
	Ans.	Having clause is used in conjunction with group by clause in MySQL. It is used to provide condition based on grouped data. On the other hand, order by clause is an independent clause used to arrange records of a table in either ascending or descending order on the basis of one or more columns.																																																		
	(h)	<p>Write SQL commands and output for the following queries:</p> <table border="1"> <thead> <tr> <th>StudentNo</th> <th>Class</th> <th>Name</th> <th>Game1</th> <th>Grade1</th> <th>Game2</th> <th>Grade2</th> </tr> </thead> <tbody> <tr> <td>10</td> <td>7</td> <td>Sameer</td> <td>Cricket</td> <td>B</td> <td>Swimming</td> <td>A</td> </tr> <tr> <td>11</td> <td>8</td> <td>Sujit</td> <td>Tennis</td> <td>A</td> <td>Skating</td> <td>C</td> </tr> <tr> <td>12</td> <td>7</td> <td>Kamal</td> <td>Swimming</td> <td>B</td> <td>Football</td> <td>B</td> </tr> <tr> <td>13</td> <td>7</td> <td>Veena</td> <td>Tennis</td> <td>C</td> <td>Tennis</td> <td>A</td> </tr> <tr> <td>14</td> <td>9</td> <td>Archana</td> <td>Basketball</td> <td>A</td> <td>Cricket</td> <td>A</td> </tr> <tr> <td>15</td> <td>10</td> <td>Arpit</td> <td>Cricket</td> <td>A</td> <td>Athletics</td> <td>C</td> </tr> </tbody> </table> <p>(i) Display the names of the students who have grade 'A' in either Game1 or Game2 or both.  (ii) Display the games taken by the students whose name starts with 'A'.  <b>Give the output of the following SQL Statements</b>  (1) SELECT COUNT(*) FROM SPORTS;  (2) SELECT DISTINCT Class FROM SPORTS;  (3) SELECT MAX(Class) FROM STUDENT;  (4) SELECT COUNT(*) FROM SPORTS GROUP BY Game1;</p>	StudentNo	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	Cricket	A	15	10	Arpit	Cricket	A	Athletics	C	4
StudentNo	Class	Name	Game1	Grade1	Game2	Grade2																																														
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14	9	Archana	Basketball	A	Cricket	A																																														
15	10	Arpit	Cricket	A	Athletics	C																																														
	Ans.	<p>(i) Select name from SPORTS where Grade1='A' OR Grade2='A';  (ii) Select Game1,Game2 from SPORTS where Name LIKE 'A%';  <b>(1 marks for each statement)</b>  (1) 6  (2) 7  8  9  10  (3) 10  (4) 2  2  1  1  <b>(1/2 marks for each output)</b></p>																																																		
<b>SECTION – D</b>																																																				
5	(a)	Leaking your company data to the outside network without prior permission of senior authority is a crime true or false. (i) True (ii) False	1																																																	
	Ans.	(i) True																																																		

(b)	What types of data are stolen by cyber-criminals in most of the cases? (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	1
Ans.	(i) Data that will pay once sold	
(c)	Explain phishing.	1
Ans.	Phishing is a term used to describe a malicious individual or group of individuals who scam users. They do so by sending emails or creating web pages that are designed to access an individual's online bank credit card, or other login information.	
(d)	Write the appropriate usage of social networks. <b>OR</b> What are the different way in which authentication of a person can be performed?.	2
Ans.	A social networking service (also known as social networking site, or SNS or social media) is an online platform which people use to build social networks or social relationships with other people who share similar personal or career interests, activities, backgrounds or real-life connections. <b>OR</b>	
(e)	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
Ans.	(i) Reena has become a victim of cyber bullying and cyber stalking. (ii) She must immediately bring it to the notice of her parents and college authorities and report this cyber crime to local police with the help of her parents.	
(f)	What are the different methods of e-waste management?	3
Ans.	<b>(1 marks for each method)</b>	