

**KENDRIYA VIDYALAYA SANGATHAN**  
**BENGALURU REGION**

**PRE-BOARD EXAMINATION –DEC 2019**

**SUB: INFORMATICS PRACTICES (NEW)**

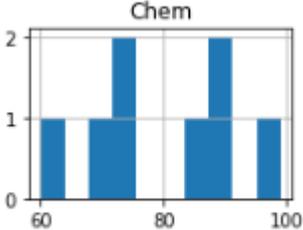
**MM: 70**

**CLASS: XII**

**TIME: 03:00 HRS**

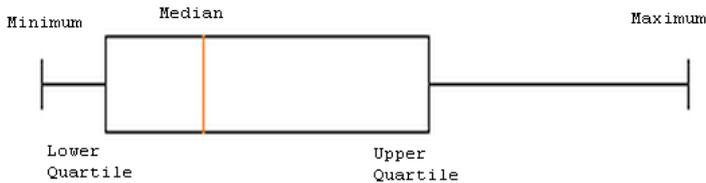
**MARKING SCHEME**

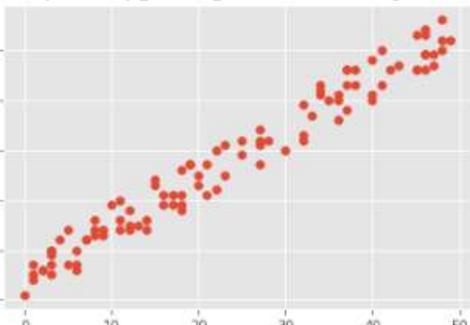
| Q1  |   |         |         |         |       |   |        |      |     |   |        |       |    |   |        |      |     |   |     |       |     |   |      |     |      |   |     |    |    |   |     |    |    |   |     |    |    |   |     |    |    |  |
|-----|---|---------|---------|---------|-------|---|--------|------|-----|---|--------|-------|----|---|--------|------|-----|---|-----|-------|-----|---|------|-----|------|---|-----|----|----|---|-----|----|----|---|-----|----|----|---|-----|----|----|--|
| 1.  | <p>What will be the output of the following python code for the given DataFrame 'Commodity'? Justify your answer.</p> <table border="1"> <thead> <tr> <th></th> <th>Product</th> <th>Company</th> <th>Price</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Laptop</td> <td>IBM</td> <td>100</td> </tr> <tr> <td>1</td> <td>Mobile</td> <td>Redme</td> <td>70</td> </tr> <tr> <td>2</td> <td>Laptop</td> <td>IBM</td> <td>150</td> </tr> <tr> <td>3</td> <td>PDA</td> <td>Apple</td> <td>90</td> </tr> </tbody> </table> <p style="text-align: right;">df1 =</p> <pre>commodity.pivot(index='Product',columns='Company',values='Price') print(df1)</pre>  |         | Product | Company | Price | 0 | Laptop | IBM  | 100 | 1 | Mobile | Redme | 70 | 2 | Laptop | IBM  | 150 | 3 | PDA | Apple | 90  | 2 |      |     |      |   |     |    |    |   |     |    |    |   |     |    |    |   |     |    |    |  |
|     | Product   | Company | Price   |         |       |   |        |      |     |   |        |       |    |   |        |      |     |   |     |       |     |   |      |     |      |   |     |    |    |   |     |    |    |   |     |    |    |   |     |    |    |  |
| 0   | Laptop  | IBM     | 100     |         |       |   |        |      |     |   |        |       |    |   |        |      |     |   |     |       |     |   |      |     |      |   |     |    |    |   |     |    |    |   |     |    |    |   |     |    |    |  |
| 1   | Mobile  | Redme   | 70      |         |       |   |        |      |     |   |        |       |    |   |        |      |     |   |     |       |     |   |      |     |      |   |     |    |    |   |     |    |    |   |     |    |    |   |     |    |    |  |
| 2   | Laptop  | IBM     | 150     |         |       |   |        |      |     |   |        |       |    |   |        |      |     |   |     |       |     |   |      |     |      |   |     |    |    |   |     |    |    |   |     |    |    |   |     |    |    |  |
| 3   | PDA   | Apple   | 90      |         |       |   |        |      |     |   |        |       |    |   |        |      |     |   |     |       |     |   |      |     |      |   |     |    |    |   |     |    |    |   |     |    |    |   |     |    |    |  |
| Ans | <p>This will give a ValueError since pivot() fails to handle the situation where index-column pair for two rows are same. Here Laptop-IBM is repeated for two rows.</p> <p>1 mark for correct answer and 1 mark for justification.</p>  |         |         |         |       |   |        |      |     |   |        |       |    |   |        |      |     |   |     |       |     |   |      |     |      |   |     |    |    |   |     |    |    |   |     |    |    |   |     |    |    |  |
| 2.  | <p>For the given DataFrame 'shop' what will be the output of the following agg() function.</p> <table border="1"> <thead> <tr> <th></th> <th>Item</th> <th>Stock</th> <th>Price</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Pen</td> <td>1000</td> <td>100</td> </tr> <tr> <td>1</td> <td>Pencil</td> <td>800</td> <td>50</td> </tr> <tr> <td>2</td> <td>Eraser</td> <td>1200</td> <td>150</td> </tr> <tr> <td>3</td> <td>Ink</td> <td>900</td> <td>200</td> </tr> </tbody> </table> <pre>df.agg({'Stock':['max','sum'],'Price':['mean','min']})</pre> <p>[Or]</p> <p>For the given DataFrame 'result' what will be the output of the following agg() function.</p> <table border="1"> <thead> <tr> <th></th> <th>Name</th> <th>Phy</th> <th>Chem</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Jim</td> <td>70</td> <td>30</td> </tr> <tr> <td>1</td> <td>Ali</td> <td>60</td> <td>70</td> </tr> <tr> <td>2</td> <td>Era</td> <td>70</td> <td>40</td> </tr> <tr> <td>3</td> <td>Kat</td> <td>80</td> <td>40</td> </tr> </tbody> </table> <pre>result.sort_values(['Phy','Chem'],ascending=[True, False])</pre> |         | Item    | Stock   | Price | 0 | Pen    | 1000 | 100 | 1 | Pencil | 800   | 50 | 2 | Eraser | 1200 | 150 | 3 | Ink | 900   | 200 |   | Name | Phy | Chem | 0 | Jim | 70 | 30 | 1 | Ali | 60 | 70 | 2 | Era | 70 | 40 | 3 | Kat | 80 | 40 |  |
|     | Item  | Stock   | Price   |         |       |   |        |      |     |   |        |       |    |   |        |      |     |   |     |       |     |   |      |     |      |   |     |    |    |   |     |    |    |   |     |    |    |   |     |    |    |  |
| 0   | Pen   | 1000    | 100     |         |       |   |        |      |     |   |        |       |    |   |        |      |     |   |     |       |     |   |      |     |      |   |     |    |    |   |     |    |    |   |     |    |    |   |     |    |    |  |
| 1   | Pencil  | 800     | 50      |         |       |   |        |      |     |   |        |       |    |   |        |      |     |   |     |       |     |   |      |     |      |   |     |    |    |   |     |    |    |   |     |    |    |   |     |    |    |  |
| 2   | Eraser  | 1200    | 150     |         |       |   |        |      |     |   |        |       |    |   |        |      |     |   |     |       |     |   |      |     |      |   |     |    |    |   |     |    |    |   |     |    |    |   |     |    |    |  |
| 3   | Ink   | 900     | 200     |         |       |   |        |      |     |   |        |       |    |   |        |      |     |   |     |       |     |   |      |     |      |   |     |    |    |   |     |    |    |   |     |    |    |   |     |    |    |  |
|     | Name  | Phy     | Chem    |         |       |   |        |      |     |   |        |       |    |   |        |      |     |   |     |       |     |   |      |     |      |   |     |    |    |   |     |    |    |   |     |    |    |   |     |    |    |  |
| 0   | Jim   | 70      | 30      |         |       |   |        |      |     |   |        |       |    |   |        |      |     |   |     |       |     |   |      |     |      |   |     |    |    |   |     |    |    |   |     |    |    |   |     |    |    |  |
| 1   | Ali   | 60      | 70      |         |       |   |        |      |     |   |        |       |    |   |        |      |     |   |     |       |     |   |      |     |      |   |     |    |    |   |     |    |    |   |     |    |    |   |     |    |    |  |
| 2   | Era   | 70      | 40      |         |       |   |        |      |     |   |        |       |    |   |        |      |     |   |     |       |     |   |      |     |      |   |     |    |    |   |     |    |    |   |     |    |    |   |     |    |    |  |
| 3   | Kat   | 80      | 40      |         |       |   |        |      |     |   |        |       |    |   |        |      |     |   |     |       |     |   |      |     |      |   |     |    |    |   |     |    |    |   |     |    |    |   |     |    |    |  |

| Ans  | <table border="1" data-bbox="347 107 635 360"> <thead> <tr> <th></th> <th>Stock</th> <th>Price</th> </tr> </thead> <tbody> <tr> <td>max</td> <td>1200.0</td> <td>NaN</td> </tr> <tr> <td>mean</td> <td>NaN</td> <td>125.0</td> </tr> <tr> <td>min</td> <td>NaN</td> <td>50.0</td> </tr> <tr> <td>sum</td> <td>3900.0</td> <td>NaN</td> </tr> </tbody> </table> <p data-bbox="347 376 1374 450">½ marks for each correct row entry. ½ mark should be given for writing correct index and column labels.</p> <p data-bbox="347 454 405 488">[Or]</p> <table border="1" data-bbox="368 495 683 748"> <thead> <tr> <th></th> <th>Name</th> <th>Phy</th> <th>Chem</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Ali</td> <td>60</td> <td>70</td> </tr> <tr> <td>2</td> <td>Era</td> <td>70</td> <td>40</td> </tr> <tr> <td>0</td> <td>Jim</td> <td>70</td> <td>30</td> </tr> <tr> <td>3</td> <td>Kat</td> <td>80</td> <td>40</td> </tr> </tbody> </table> <p data-bbox="347 752 1369 819">1 mark for each correctly sorted column. 1 mark for correctly writing the index and the column labels</p> |       | Stock | Price | max | 1200.0 | NaN | mean | NaN | 125.0 | min | NaN | 50.0 | sum | 3900.0 | NaN |  | Name | Phy | Chem | 1 | Ali | 60 | 70 | 2 | Era | 70 | 40 | 0 | Jim | 70 | 30 | 3 | Kat | 80 | 40 |  |
|------|--|-------|-------|-------|-----|--------|-----|------|-----|-------|-----|-----|------|-----|--------|-----|--|------|-----|------|---|-----|----|----|---|-----|----|----|---|-----|----|----|---|-----|----|----|--|
|      | Stock  | Price |       |       |     |        |     |      |     |       |     |     |      |     |        |     |  |      |     |      |   |     |    |    |   |     |    |    |   |     |    |    |   |     |    |    |  |
| max  | 1200.0   | NaN   |       |       |     |        |     |      |     |       |     |     |      |     |        |     |  |      |     |      |   |     |    |    |   |     |    |    |   |     |    |    |   |     |    |    |  |
| mean | NaN  | 125.0 |       |       |     |        |     |      |     |       |     |     |      |     |        |     |  |      |     |      |   |     |    |    |   |     |    |    |   |     |    |    |   |     |    |    |  |
| min  | NaN  | 50.0  |       |       |     |        |     |      |     |       |     |     |      |     |        |     |  |      |     |      |   |     |    |    |   |     |    |    |   |     |    |    |   |     |    |    |  |
| sum  | 3900.0   | NaN   |       |       |     |        |     |      |     |       |     |     |      |     |        |     |  |      |     |      |   |     |    |    |   |     |    |    |   |     |    |    |   |     |    |    |  |
|      | Name   | Phy   | Chem  |       |     |        |     |      |     |       |     |     |      |     |        |     |  |      |     |      |   |     |    |    |   |     |    |    |   |     |    |    |   |     |    |    |  |
| 1    | Ali  | 60    | 70    |       |     |        |     |      |     |       |     |     |      |     |        |     |  |      |     |      |   |     |    |    |   |     |    |    |   |     |    |    |   |     |    |    |  |
| 2    | Era  | 70    | 40    |       |     |        |     |      |     |       |     |     |      |     |        |     |  |      |     |      |   |     |    |    |   |     |    |    |   |     |    |    |   |     |    |    |  |
| 0    | Jim  | 70    | 30    |       |     |        |     |      |     |       |     |     |      |     |        |     |  |      |     |      |   |     |    |    |   |     |    |    |   |     |    |    |   |     |    |    |  |
| 3    | Kat  | 80    | 40    |       |     |        |     |      |     |       |     |     |      |     |        |     |  |      |     |      |   |     |    |    |   |     |    |    |   |     |    |    |   |     |    |    |  |
| 3.   | While using the describe method on a DataFrame column containing numeric values, mention any two parameters that are computed by the describe() method.  | 1     |       |       |     |        |     |      |     |       |     |     |      |     |        |     |  |      |     |      |   |     |    |    |   |     |    |    |   |     |    |    |   |     |    |    |  |
| Ans  | Any two out of count, mean, std, min, 25%, 50%, 75% and max  |       |       |       |     |        |     |      |     |       |     |     |      |     |        |     |  |      |     |      |   |     |    |    |   |     |    |    |   |     |    |    |   |     |    |    |  |
| 4.   | <p data-bbox="347 936 1222 969">i) For the given histogram below the number of bins are _____</p>  <p data-bbox="347 1234 1390 1267">ii) In statistics the value at .5 quantile in a dataset is also known as _____ :</p>  | 2     |       |       |     |        |     |      |     |       |     |     |      |     |        |     |  |      |     |      |   |     |    |    |   |     |    |    |   |     |    |    |   |     |    |    |  |
| Ans  | <p data-bbox="392 1312 587 1346">i) 10 bins</p> <p data-bbox="392 1350 831 1384">ii) 2<sup>nd</sup> Quartile or the median</p>   |       |       |       |     |        |     |      |     |       |     |     |      |     |        |     |  |      |     |      |   |     |    |    |   |     |    |    |   |     |    |    |   |     |    |    |  |
| 5.   | The function used in pandas to acquire a specific group from a group created using groupby() function is _____   | 1     |       |       |     |        |     |      |     |       |     |     |      |     |        |     |  |      |     |      |   |     |    |    |   |     |    |    |   |     |    |    |   |     |    |    |  |
| Ans  | <p data-bbox="347 1469 501 1503">get_group()</p> <p data-bbox="347 1507 683 1541">1 mark for correct answer</p>  |       |       |       |     |        |     |      |     |       |     |     |      |     |        |     |  |      |     |      |   |     |    |    |   |     |    |    |   |     |    |    |   |     |    |    |  |
| 6.   | <p data-bbox="347 1547 1362 1603">Write a python statement to fill in the blanks so that the given output with sum of values for each column is obtained:</p> <pre data-bbox="347 1615 906 1973">import pandas as pd data= {'M':[20,40,60,80],\       'N':[70,80,50,90],'Q':[60,50,60,80]} points = pd.DataFrame(data) summery = _____ print(summery) M    200 N    290 Q    250 dtype: int64</pre> <p data-bbox="831 1984 887 2018">[Or]</p> <p data-bbox="347 2022 1390 2123">While using transform() function on a DataFrame we need to often use an anonymous function called lambda whose result is uniformly applied on all the data elements of the DataFrame. What will be the output of the following python</p>  | 2     |       |       |     |        |     |      |     |       |     |     |      |     |        |     |  |      |     |      |   |     |    |    |   |     |    |    |   |     |    |    |   |     |    |    |  |

|   |      | <pre>code import pandas as pd data = {'X':[10,20,30,40], 'Y':[70,20,50,90],'Z':[30,50,60,70]} df = pd.DataFrame(data) df.applymap(lambda x:x*2) print(df1)</pre>  |      |   |   |   |   |      |      |      |   |      |     |     |   |     |     |     |   |    |     |     |  |
|---|------|---|------|---|---|---|---|------|------|------|---|------|-----|-----|---|-----|-----|-----|---|----|-----|-----|--|
|   | Ans  | <pre>summery = df.apply('sum')</pre> <p>2 mark for correct answer. 1 mark to be given for writing only apply() function</p> <p>[Or]</p> <table border="1"> <thead> <tr> <th></th> <th>X</th> <th>Y</th> <th>Z</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>20</td> <td>140</td> <td>60</td> </tr> <tr> <td>1</td> <td>40</td> <td>40</td> <td>100</td> </tr> <tr> <td>2</td> <td>60</td> <td>100</td> <td>120</td> </tr> <tr> <td>3</td> <td>80</td> <td>180</td> <td>140</td> </tr> </tbody> </table> <p>2 marks for the correct output. ½ mark for each correct row value.</p> |      | X | Y | Z | 0 | 20   | 140  | 60   | 1 | 40   | 40  | 100 | 2 | 60  | 100 | 120 | 3 | 80 | 180 | 140 |  |
|   | X    | Y   | Z    |   |   |   |   |      |      |      |   |      |     |     |   |     |     |     |   |    |     |     |  |
| 0 | 20   | 140   | 60   |   |   |   |   |      |      |      |   |      |     |     |   |     |     |     |   |    |     |     |  |
| 1 | 40   | 40  | 100  |   |   |   |   |      |      |      |   |      |     |     |   |     |     |     |   |    |     |     |  |
| 2 | 60   | 100   | 120  |   |   |   |   |      |      |      |   |      |     |     |   |     |     |     |   |    |     |     |  |
| 3 | 80   | 180   | 140  |   |   |   |   |      |      |      |   |      |     |     |   |     |     |     |   |    |     |     |  |
|   | 6.   | <p>What will be the output of the following python code:</p> <pre>import pandas as pd df = pd.DataFrame([[10,5,5],[20,10,30],[30,15,20]],\                   index=['A','B','C'], columns=['X','Y','Z']) f1=df.reindex(['B','A','D']) print(f1)</pre>   | 2    |   |   |   |   |      |      |      |   |      |     |     |   |     |     |     |   |    |     |     |  |
|   | Ans  | <table border="1"> <thead> <tr> <th></th> <th>X</th> <th>Y</th> <th>Z</th> </tr> </thead> <tbody> <tr> <td>B</td> <td>20.0</td> <td>10.0</td> <td>30.0</td> </tr> <tr> <td>A</td> <td>10.0</td> <td>5.0</td> <td>5.0</td> </tr> <tr> <td>D</td> <td>NaN</td> <td>NaN</td> <td>NaN</td> </tr> </tbody> </table> <p>2 marks for correct answer. 1 mark for correctly finding the values for row with NaN values.</p>  |      | X | Y | Z | B | 20.0 | 10.0 | 30.0 | A | 10.0 | 5.0 | 5.0 | D | NaN | NaN | NaN |   |    |     |     |  |
|   | X    | Y   | Z    |   |   |   |   |      |      |      |   |      |     |     |   |     |     |     |   |    |     |     |  |
| B | 20.0 | 10.0  | 30.0 |   |   |   |   |      |      |      |   |      |     |     |   |     |     |     |   |    |     |     |  |
| A | 10.0 | 5.0   | 5.0  |   |   |   |   |      |      |      |   |      |     |     |   |     |     |     |   |    |     |     |  |
| D | NaN  | NaN   | NaN  |   |   |   |   |      |      |      |   |      |     |     |   |     |     |     |   |    |     |     |  |
|   | Q2   |   |      |   |   |   |   |      |      |      |   |      |     |     |   |     |     |     |   |    |     |     |  |
|   | 1.   | <p>i) Write a python statement to create a 3x3 2D matrix with all elements as 10</p> <p>ii) What will be the output of the following:</p> <pre>import numpy as np arr = np.array([1,2,3,4]) arr1 = arr+4 print(arr1)</pre>  | 2    |   |   |   |   |      |      |      |   |      |     |     |   |     |     |     |   |    |     |     |  |
|   | Ans  | <p>i) <code>numpy.full((3,3),10)</code></p> <p>ii) <code>[5 6 7 8]</code></p> <p>No mark to be deducted for not enclosing the values in square brackets.<br/>1 mark for each correct answer.</p>  |      |   |   |   |   |      |      |      |   |      |     |     |   |     |     |     |   |    |     |     |  |
|   | 2.   | <p>Fill in the blanks with proper function name and arguments so that the given output is achieved.</p> <pre>import numpy as np arr = _____ print(arr) [0 2 4 6 8]</pre>  | 2    |   |   |   |   |      |      |      |   |      |     |     |   |     |     |     |   |    |     |     |  |
|   | Ans  | <pre>np.arange(0,10,2) or np.linspace(0,8,5, dtype='int8')</pre>  |      |   |   |   |   |      |      |      |   |      |     |     |   |     |     |     |   |    |     |     |  |

|     |   |   |
|-----|---|---|
|     | 2 marks for correct answer. ½ marks to be deducted for each error. 1 mark o be given for writing correct function name  |   |
| 3.  | <p>i) What will be to output of the following slice on a numpy array</p> <pre>import numpy as np data = np.array([[10,20,30,40],[5,15,25,35],[2,4,6,8]]) s1 = data[0:3:2,2:4] print(s1)</pre> <p>[Or]</p> <p>ii) What will be the output of the given NumPy codes</p> <pre>import numpy as np a = np.array([[1,2],[3,4]], dtype=np.int32) b = np.array([[2,1],[8,2]], dtype=np.int32) c = np.subtract(a,b) print(c)</pre>   | 2 |
| Ans | <p>i) <pre>[[30 40]  [ 6  8]]</pre></p> <p>ii) <pre>[[ -1  1]  [-5  2]]</pre></p> <p>1 mark for each correct answer. ½ mark should be deducted for errors in computing values.</p>  |   |
| 4.  | <p>For the given NumPy arrays write a statement to join the two arrays so that the resultant array is formed as shown in the figure:</p> <pre>import numpy as np x = np.array([[5,10,20],[15,30,40]]) y = np.array([[20,60]]) res = _____ print(res)</pre> <pre>[[ 5 10 20 20]  [15 30 40 60]]</pre> <p>[Or]</p> <p>What will be the output of the following DataFrame operation?</p> <pre>import numpy as np arr = np.array([[1,2,3,4],[6,7,8,9],[5,4,3,10]]) x,y = np.hsplit(arr,2) print(x) print(y)</pre> | 2 |
| Ans | <p><code>np.concatenate((x,y.T),axis=1)</code> or <code>np.hstack((x,y.T))</code></p> <p>2 marks for the correct statement. ½ marks should be deducted for syntax error.</p> <p>Or</p> <pre>[[1 2]  [6 7]  [5 4]] [[ 3  4]  [ 8  9]  [ 3 10]]</pre> <p>1 mark each for correct print statement</p>  |   |
| 5.  | <p>i) The numpy function used to calculate covariance between two variables a and b is _____</p> <p>ii) The numpy function used to compute correlation coefficient between two</p>  | 2 |

|            |            | variables a and b is _____<br>_____   |       |            |         |      |        |      |       |      |            |      |      |      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|------------|------------|---|-------|------------|---------|------|--------|------|-------|------|------------|------|------|------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|            | Ans        | i) cov(a,b)<br>ii) corrcoef(a,b)<br>1 mark for each correct answer. ½ for each writing only the function without parameters.  |       |            |         |      |        |      |       |      |            |      |      |      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|            | 6.         | In _____ a single independent variable is used to predict the value of a dependent variable.  | 1     |            |         |      |        |      |       |      |            |      |      |      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|            | Ans        | Linear Regression Or Regression   |       |            |         |      |        |      |       |      |            |      |      |      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|            |            |   |       |            |         |      |        |      |       |      |            |      |      |      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|            | Q3         |   |       |            |         |      |        |      |       |      |            |      |      |      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|            | 1.         | Draw a labeled diagram of a horizontal boxplot indicating names of all the summery information.<br><br>[Or]<br>What is the structure of a histogram if cumulative attribute is set to be True.  | 2     |            |         |      |        |      |       |      |            |      |      |      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|            | Ans        |  <p>If cumulative attribute is set to True, the histogram is computed where each bin gives the counts in that bin plus all bins having smaller values. The last bin gives the total number of data points.</p>  |       |            |         |      |        |      |       |      |            |      |      |      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|            | 2.         | Write a python program to draw a bar chart with the following information:<br><table border="1" data-bbox="347 1115 694 1339"> <thead> <tr> <th>Birds</th> <th>Population</th> </tr> </thead> <tbody> <tr> <td>Peacock</td> <td>2600</td> </tr> <tr> <td>Parrot</td> <td>3000</td> </tr> <tr> <td>Monal</td> <td>1000</td> </tr> <tr> <td>Flycatcher</td> <td>5000</td> </tr> <tr> <td>Crow</td> <td>1200</td> </tr> </tbody> </table> <p>The bachart should have the following features:<br/> a) X-axis label should be 'Birds' and Y-axis label should be 'Population'<br/> b) The title of the chart should be 'Bird Population'<br/> c) The colour of the bars should be 'Green'</p> <p>Use proper import statements in the program.</p> <p>Or</p> <p>Write a python program to draw a histogram with following information:<br/> <table border="1" data-bbox="347 1630 1117 1709"> <tbody> <tr> <td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td> </tr> <tr> <td>0</td><td>5</td><td>0</td><td>0</td><td>0</td><td>5</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>5</td><td>5</td> </tr> </tbody> </table> <p>The histogram should have following information<br/> a) X-axis label should be score and Y-axis should be Frequency<br/> b) The title should be Frequency of Score<br/> c) The colour of histogram should be blue with 10 bins</p> <p>Use proper import statements in the program</p> </p> | Birds | Population | Peacock | 2600 | Parrot | 3000 | Monal | 1000 | Flycatcher | 5000 | Crow | 1200 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 0 | 5 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 5 | 5 | 4 |
| Birds      | Population |   |       |            |         |      |        |      |       |      |            |      |      |      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Peacock    | 2600       |   |       |            |         |      |        |      |       |      |            |      |      |      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Parrot     | 3000       |   |       |            |         |      |        |      |       |      |            |      |      |      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Monal      | 1000       |   |       |            |         |      |        |      |       |      |            |      |      |      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Flycatcher | 5000       |   |       |            |         |      |        |      |       |      |            |      |      |      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Crow       | 1200       |   |       |            |         |      |        |      |       |      |            |      |      |      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 1          | 1          | 1   | 1     | 1          | 1       | 2    | 2      | 2    | 2     | 2    | 2          | 2    |      |      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 0          | 5          | 0   | 0     | 0          | 5       | 0    | 0      | 0    | 0     | 0    | 5          | 5    |      |      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|            |            | <pre>import matplotlib.pyplot as plt import numpy as np Birds = np.array(['Peacock','Parrot','Monal','Flycatcher','Crow']) Population = np.array([2600,3000,1000,5000,1200]) plt.xlabel('Birds') plt.ylabel('Population')</pre>   |       |            |         |      |        |      |       |      |            |      |      |      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

|     |   |   |
|-----|---|---|
|     | <pre>plt.title('Bird Population') plt.bar(Birds,Population, color='green') plt.show()</pre> <p>½ mark for import, ½ each for declaring two arrays or lists<br/> ½ mark each for xlabel, ylabel and title<br/> ½ mark for plt.bar() function with correct parameters<br/> ½ mark for show function</p> <p>Or</p> <pre>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()</pre> <p>½ mark for import, ½ for declaring array or list<br/> ½ mark each for xlabel, ylabel and title<br/> 1 mark for plt.hist() function with correct parameters<br/> ½ mark for show function</p> |   |
| 3.  | <p>Identify the type of plot from the given figure</p>   | 1 |
| Ans | scatter plot  |   |
| Q4  |   |   |
| 1.  | What are sprints in Scrum? How a sprint ends?   | 2 |
| Ans | Scrum relies on an Agile Software development concept called Sprints. They are a period of time when software development is actually done. It ends when a specified period is over.  |   |
| 2.  | Draw a Use-case diagram of a Banking system.  | 3 |

|     |   |   |
|-----|---|---|
| Ans | <div data-bbox="438 145 1305 772" data-label="Diagram"> <p><b>Banking System Use Case Diagram</b></p> <pre> graph LR     subgraph System         UC1(open_account)         UC2(withdraw_cash)         UC3(clear_checks)         UC4(loan_application)         UC5(get_report)     end     Customer((Customer)) --&gt; UC2     Customer --&gt; UC3     Customer --&gt; UC4     Manager((Manager)) --&gt; UC5     CashDispenser((Cash Dispenser)) --&gt; UC1     CashDispenser --&gt; UC2     Clerk((Clerk)) --&gt; UC3     LoanOfficer((Loan Officer)) --&gt; UC4 </pre> </div> <p>3 marks for correct answer.</p> |   |
| 3.  | Give one advantage of pair programming.   | 1 |
| Ans | <ul style="list-style-type: none"> <li>• Collective code ownership</li> <li>• Better code</li> <li>• Increased discipline</li> </ul> <p>1 mark for 1 correct answer.</p>  |   |
| 4.  | Mention one feature of GIT.   | 1 |
| Ans | <ol style="list-style-type: none"> <li>1. Automatic backup of whole repository.</li> <li>2. Maintains full history of the changes.</li> </ol> <p>Any one valid point one mark.</p>  |   |
| Q5  |   |   |
| 1.  | Draw a labeled diagram of Waterfall model.  | 3 |
| Ans | Correct diagram 3 marks.  |   |
| 2.  | <p>Out of the following who is not a part of the Scrum Team</p> <ol style="list-style-type: none"> <li>i) Product Manager</li> <li>ii) Scrum Master</li> <li>iii) Development Team</li> <li>iv) Project Manager</li> </ol>  | 1 |
| Ans | Project Manager<br>1 mark for correct answer.   |   |
| 3.  | What is the difference between Commit and push request on a Version Control System?   | 2 |
| Ans | <p>Commit refers to updating the file in local repository on a Distributed Version Control System.</p> <p>Push refers to updating the file in remote repository on a distributed version control system.</p> <p>2 marks for correct answer.</p>   |   |
| 4.  | What do you mean by Agile software development.   | 2 |
| Ans | <p>Agile software development is a set of methods and practices where solutions evolve through collaboration between self-organizing, cross functional teams.</p> <p>2 marks for correct answer.</p>  |   |
| Q6  |   |   |
| 1.  | Write the command to run a Django server?   | 2 |

|                  | Ans      | python manage.py runserver  |                  |              |            |        |              |         |        |         |       |          |     |         |       |       |    |     |       |           |       |    |     |      |         |       |    |   |
|------------------|----------|---|------------------|--------------|------------|--------|--------------|---------|--------|---------|-------|----------|-----|---------|-------|-------|----|-----|-------|-----------|-------|----|-----|------|---------|-------|----|---|
|                  | 2.       | Mention difference between get() and post() methods?  | 2                |              |            |        |              |         |        |         |       |          |     |         |       |       |    |     |       |           |       |    |     |      |         |       |    |   |
|                  | Ans      | Get()-HTTP get request-User send a URL via client(Web Browser) and Web server makes available the web page's HTML at the given URL after performing the required tasks.<br>Post()-HTTP Post request-User send some data(Through a form) which is saved in a database.   |                  |              |            |        |              |         |        |         |       |          |     |         |       |       |    |     |       |           |       |    |     |      |         |       |    |   |
|                  | 3.       | Which module you will import in your python program for effectively connecting to MySQL Database.   | 1                |              |            |        |              |         |        |         |       |          |     |         |       |       |    |     |       |           |       |    |     |      |         |       |    |   |
|                  | Ans      | import mysql.connector  |                  |              |            |        |              |         |        |         |       |          |     |         |       |       |    |     |       |           |       |    |     |      |         |       |    |   |
|                  | 4.       | The 'Student' table is stored in the database 'School' in MySQL. The database credentials include host as 'localhost', user as 'root' and password as '1234'. The Student Table has following data:<br><table border="1" data-bbox="391 577 1321 772"> <thead> <tr> <th>RollNo</th> <th>SName</th> <th>Class</th> <th>Marks</th> </tr> </thead> <tbody> <tr> <td>1000</td> <td>Kritika</td> <td>12</td> <td>90</td> </tr> <tr> <td>1001</td> <td>Malavika</td> <td>12</td> <td>95</td> </tr> <tr> <td>1002</td> <td>Mohan</td> <td>11</td> <td>70</td> </tr> <tr> <td>1003</td> <td>Vivek</td> <td>11</td> <td>62</td> </tr> </tbody> </table> <p>Write Python codes to do the following:<br/> a) Import the required library to establish connection between MySQL and Python<br/> b) Establish Connection with the database and instantiate a cursor.<br/> c) Display the details of students who belongs to class 12.<br/> d) Close the connection</p> | RollNo           | SName        | Class      | Marks  | 1000         | Kritika | 12     | 90      | 1001  | Malavika | 12  | 95      | 1002  | Mohan | 11 | 70  | 1003  | Vivek     | 11    | 62 | 4   |      |         |       |    |   |
| RollNo           | SName    | Class   | Marks            |              |            |        |              |         |        |         |       |          |     |         |       |       |    |     |       |           |       |    |     |      |         |       |    |   |
| 1000             | Kritika  | 12  | 90               |              |            |        |              |         |        |         |       |          |     |         |       |       |    |     |       |           |       |    |     |      |         |       |    |   |
| 1001             | Malavika | 12  | 95               |              |            |        |              |         |        |         |       |          |     |         |       |       |    |     |       |           |       |    |     |      |         |       |    |   |
| 1002             | Mohan    | 11  | 70               |              |            |        |              |         |        |         |       |          |     |         |       |       |    |     |       |           |       |    |     |      |         |       |    |   |
| 1003             | Vivek    | 11  | 62               |              |            |        |              |         |        |         |       |          |     |         |       |       |    |     |       |           |       |    |     |      |         |       |    |   |
|                  | Ans      | a) import mysql.connector as m<br>b) con=m.connect(host="localhost",user="root",passwd="1234",database="School")<br>cur=con.cursor()<br>c) sq="select * from Student where Class=12"<br>cur.execute(sq)<br>d) cur.commit()<br>1 mark for each correct answer.   |                  |              |            |        |              |         |        |         |       |          |     |         |       |       |    |     |       |           |       |    |     |      |         |       |    |   |
|                  | 5.       | Name two aggregate functions in MySQL.  | 2                |              |            |        |              |         |        |         |       |          |     |         |       |       |    |     |       |           |       |    |     |      |         |       |    |   |
|                  | Ans      | Any two aggregate function 1 mark each  |                  |              |            |        |              |         |        |         |       |          |     |         |       |       |    |     |       |           |       |    |     |      |         |       |    |   |
|                  | 6.       | Consider the following Teacher table: Write SQL commands for (i) and output for (ii).<br><table border="1" data-bbox="464 1523 1273 1720"> <thead> <tr> <th>Tid</th> <th>TName</th> <th>Department</th> <th>Salary</th> <th>Noof Periods</th> </tr> </thead> <tbody> <tr> <td>100</td> <td>Joseph</td> <td>Physics</td> <td>45000</td> <td>25</td> </tr> <tr> <td>101</td> <td>Lakshmi</td> <td>Hindi</td> <td>55000</td> <td>25</td> </tr> <tr> <td>102</td> <td>Neelu</td> <td>Chemistry</td> <td>66000</td> <td></td> </tr> <tr> <td>103</td> <td>John</td> <td>Physics</td> <td>40000</td> <td>25</td> </tr> </tbody> </table> <p>(i) To display the details of Teacher table in ascending order of Salary.<br/> (ii) SELECT avg(NoofPeriods) from Teacher;</p>   | Tid              | TName        | Department | Salary | Noof Periods | 100     | Joseph | Physics | 45000 | 25       | 101 | Lakshmi | Hindi | 55000 | 25 | 102 | Neelu | Chemistry | 66000 |    | 103 | John | Physics | 40000 | 25 | 2 |
| Tid              | TName    | Department  | Salary           | Noof Periods |            |        |              |         |        |         |       |          |     |         |       |       |    |     |       |           |       |    |     |      |         |       |    |   |
| 100              | Joseph   | Physics   | 45000            | 25           |            |        |              |         |        |         |       |          |     |         |       |       |    |     |       |           |       |    |     |      |         |       |    |   |
| 101              | Lakshmi  | Hindi   | 55000            | 25           |            |        |              |         |        |         |       |          |     |         |       |       |    |     |       |           |       |    |     |      |         |       |    |   |
| 102              | Neelu    | Chemistry   | 66000            |              |            |        |              |         |        |         |       |          |     |         |       |       |    |     |       |           |       |    |     |      |         |       |    |   |
| 103              | John     | Physics   | 40000            | 25           |            |        |              |         |        |         |       |          |     |         |       |       |    |     |       |           |       |    |     |      |         |       |    |   |
|                  | Ans      | (i) SELECT * from Teacher order by Salary asc;<br>(ii) <table border="1" data-bbox="491 1877 766 1973"> <tr> <td>Avg(NoofPeriods)</td> </tr> <tr> <td>25</td> </tr> </table>  | Avg(NoofPeriods) | 25           |            |        |              |         |        |         |       |          |     |         |       |       |    |     |       |           |       |    |     |      |         |       |    |   |
| Avg(NoofPeriods) |          |   |                  |              |            |        |              |         |        |         |       |          |     |         |       |       |    |     |       |           |       |    |     |      |         |       |    |   |
| 25               |          |   |                  |              |            |        |              |         |        |         |       |          |     |         |       |       |    |     |       |           |       |    |     |      |         |       |    |   |
|                  | 7.       | Consider the above table Teacher and answer the following questions.<br>(i) Display Department, total Teachers in each Department.<br>(ii) What will be the output of the following SQL command?<br>SELECT Department, count(*) from Teacher GROUP BY Department having   | 2                |              |            |        |              |         |        |         |       |          |     |         |       |       |    |     |       |           |       |    |     |      |         |       |    |   |

|            |          | count(*)>=2;  |            |          |         |   |   |
|------------|----------|---|------------|----------|---------|---|---|
|            | Ans      | (i) SELECT Department,count(*) from Teacher group by Department;<br>(ii) <table border="1" data-bbox="491 210 1038 304"> <thead> <tr> <th>Department</th> <th>Count(*)</th> </tr> </thead> <tbody> <tr> <td>Physics</td> <td>2</td> </tr> </tbody> </table><br>1 Mark each. | Department | Count(*) | Physics | 2 | 2 |
| Department | Count(*) |   |            |          |         |   |   |
| Physics    | 2        |   |            |          |         |   |   |
|            |          |   |            |          |         |   |   |
|            |          |   |            |          |         |   |   |
|            | Q7       |   |            |          |         |   |   |
|            | 1.       | _____ refers to any information about you or created by you that exists in digital form either online or on an electronic storage device.   | 1          |          |         |   |   |
|            | Ans      | Digital Property  |            |          |         |   |   |
|            | 2.       | Online _____ is the theft of personal information in order to commit fraud.   | 1          |          |         |   |   |
|            | Ans      | Identity Theft  |            |          |         |   |   |
|            | 3.       | What do you mean by Phishing? Give one example.   | 2          |          |         |   |   |
|            | Ans      | Phishing is the practice of attempting to acquire sensitive information from individuals over the internet by means of deception.<br>Correct answer and valid example 2 marks.  |            |          |         |   |   |
|            | 4.       | Give one benefit of e-Waste recycling?  | 1          |          |         |   |   |
|            | Ans      | Allows for recovery of valuable precious metal, reduces toxic waste, protects public health and water quality.<br>Or any other valid point 1 mark.  |            |          |         |   |   |
|            | 5.       | What do you mean by crowdsourcing?  | 2          |          |         |   |   |
|            | Ans      | It refers to the practice of obtaining the contribution from crowd in the form of needed services,ideas or content mainly from online community.  |            |          |         |   |   |
|            | 6        | Mention any two steps to overcome Internet Addiction?   | 2          |          |         |   |   |
|            | Ans      | Any two valid measures 1 mark each.   |            |          |         |   |   |
|            | 7.       | _____ is a cryptocurrency which is in the form of a software code written and controlled by an Open Source Software.  | 1          |          |         |   |   |
|            | Ans      | Bitcoin.  |            |          |         |   |   |