

| <b>MBA BUSINESS ANALYTICS, VISTAS</b>  |                                       |                        |   |
|--|---------------------------------------|------------------------|---|
| <b>UNIVERSITY LAB EXAMINATION</b>  |                                       |                        |   |
| <b>ANSWER ALL THE QUESTIONS (60 MARKS)</b>   |                                       |                        |   |
| <b>REGISTER NUMBER</b>   | 23316101                              | <b>NAME</b>            | ABIRAMI M                                   |
| <b>SUBJECT CODE</b>  | 23PMBN12                              | <b>SUBJECT NAME</b>    | DATA VISUALIZATION USING R AND PYTHON (IBM) |
| <b>DEGREE/BRANCH</b>   | MBA BUSINESS ANALYTICS                | <b>TIME &amp; DATE</b> | 09.30 AM & 05.12.23                         |
| <p>To create different types of graphs for user inputs.</p> <div style="display: flex; justify-content: space-between;"> <span>a) Line graph</span> <span>b) Line Graph with style</span> </div> <div style="display: flex; justify-content: space-between;"> <span>c) Bar Graph (Horizontal and vertical)</span> <span>d) Histogram</span> </div> <div style="display: flex; justify-content: space-between;"> <span>e) Scatter Plot.</span> </div> |                                       |                        |   |
| Aim, algorithm and Explanation (25)  | Output & RESULT<br>(15),<br>Viva (20) | Total (60)             |   |
|  |                                       |                        |   |

**MBA BUSINESS ANALYTICS, VISTAS  
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**ANSWER ALL THE  
QUESTIONS (60 MARKS)**

|                 |                        |              |   |
|-----------------|------------------------|--------------|---|
| REGISTER NUMBER | 23316102               | NAME         | AJAY.G                                      |
| SUBJECT CODE    | 23PMBN12               | SUBJECT NAME | DATA VISUALIZATION USING R AND PYTHON (IBM) |
| DEGREE/BRANCH   | MBA BUSINESS ANALYTICS | TIME & DATE  | 09.30 AM & 05.12.23                         |

To Do the data manipulation operations for the iris and mtcars dataset using the dplyr package and obtain the results for the following functions.

i) filter   ii) select   iii) arrange   iv) summarize   v) mutate

|                                     |                                 |            |
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| Aim, algorithm and Explanation (25) | Output & RESULT (15), Viva (20) | Total (60) |
|                                     |                                 |            |

**MBA BUSINESS ANALYTICS, VISTAS  
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**ANSWER ALL THE  
QUESTIONS (60 MARKS)**

|                 |                        |              |   |
|-----------------|------------------------|--------------|---|
| REGISTER NUMBER | 23316103               | NAME         | ARAVIND J                                   |
| SUBJECT CODE    | 23PMBN12               | SUBJECT NAME | DATA VISUALIZATION USING R AND PYTHON (IBM) |
| DEGREE/BRANCH   | MBA BUSINESS ANALYTICS | TIME & DATE  | 09.30 AM & 05.12.23                         |

To Create a data frame and do the following operations using tidyr package.

i)gather    ii) spread    iii) separate    iv) unite

|                                     |                                       |            |
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| Aim, algorithm and Explanation (25) | Output & RESULT<br>(15),<br>Viva (20) | Total (60) |
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**ANSWER ALL THE  
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|                 |                        |              |   |
|-----------------|------------------------|--------------|---|
| REGISTER NUMBER | 23316104               | NAME         | ARUL SELVAN M                               |
| SUBJECT CODE    | 23PMBN12               | SUBJECT NAME | DATA VISUALIZATION USING R AND PYTHON (IBM) |
| DEGREE/BRANCH   | MBA BUSINESS ANALYTICS | TIME & DATE  | 09.30 AM & 05.12.23                         |

To Do the data manipulation operations for the iris and air quality dataset using data. table package and obtain the results for the following functions.

- a. Select a subset row
- b. Select a column with particular values
- c. Select columns with multiple values
- d. Select a column to return a vector
- e. Select multiple columns
- f. Returns the sum and standard deviation
- g. Sum of selected columns

|                                     |                                       |            |
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| Aim, algorithm and Explanation (25) | Output & RESULT<br>(15),<br>Viva (20) | Total (60) |
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| <b>MBA BUSINESS ANALYTICS, VISTAS</b><br><b>UNIVERSITY LAB EXAMINATION</b>   |                                 |              |   |
| <b>ANSWER ALL THE QUESTIONS (60 MARKS)</b>   |                                 |              |   |
| REGISTER NUMBER  | 23316105                        | NAME         | ARUN KUMAR KR                               |
| SUBJECT CODE   | 23PMBN12                        | SUBJECT NAME | DATA VISUALIZATION USING R AND PYTHON (IBM) |
| DEGREE/BRANCH  | MBA BUSINESS ANALYTICS          | TIME & DATE  | 09.30 AM & 05.12.23                         |
| <p>To do the different visualization types for air quality data set using the ggplot package in R.</p> <ol style="list-style-type: none"> <li>Line graph</li> <li>Bar graph</li> <li>Histogram</li> <li>Scatter plot</li> <li>Pie chart</li> </ol> |                                 |              |   |
| Aim, algorithm and Explanation (25)  | Output & RESULT (15), Viva (20) | Total (60)   |   |
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**MBA BUSINESS ANALYTICS, VISTAS  
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QUESTIONS (60 MARKS)**

|                 |                        |              |   |
|-----------------|------------------------|--------------|---|
| REGISTER NUMBER | 23316106               | NAME         | GOKUL K                                     |
| SUBJECT CODE    | 23PMBN12               | SUBJECT NAME | DATA VISUALIZATION USING R AND PYTHON (IBM) |
| DEGREE/BRANCH   | MBA BUSINESS ANALYTICS | TIME & DATE  | 09.30 AM & 05.12.23                         |

To write a Program to create maps with markers and Chropleth maps with Folium.

|                                     |                                 |            |
|-------------------------------------|---------------------------------|------------|
| Aim, algorithm and Explanation (25) | Output & RESULT (15), Viva (20) | Total (60) |
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**MBA BUSINESS ANALYTICS, VISTAS**  
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**ANSWER ALL THE  
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|                 |                        |              |   |
|-----------------|------------------------|--------------|---|
| REGISTER NUMBER | 23316107               | NAME         | JANAKI MAKESH                               |
| SUBJECT CODE    | 23PMBN12               | SUBJECT NAME | DATA VISUALIZATION USING R AND PYTHON (IBM) |
| DEGREE/BRANCH   | MBA BUSINESS ANALYTICS | TIME & DATE  | 09.30 AM & 05.12.23                         |

To create different types of graphs for user inputs.

- a) Line graph
- b) Line Graph with style
- c) Bar Graph (Horizontal and vertical)
- d) Histogram
- e) Scatter Plot.

- a) Line graph                                      b) Line Graph with style
- c) Bar Graph (Horizontal and vertical)    d) Histogram
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|                                     |                                 |            |
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|                 |                        |              |   |
|-----------------|------------------------|--------------|---|
| REGISTER NUMBER | 23316108               | NAME         | KARAN KUMAR R                               |
| SUBJECT CODE    | 23PMBN12               | SUBJECT NAME | DATA VISUALIZATION USING R AND PYTHON (IBM) |
| DEGREE/BRANCH   | MBA BUSINESS ANALYTICS | TIME & DATE  | 09.30 AM & 05.12.23                         |

To Do the data manipulation operations for the iris and mtcars dataset using the dplyr package and obtain the results for the following functions.

i)filter ii) select iii) arrange iv) summarize v) mutate

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| Aim, algorithm and Explanation (25) | Output & RESULT (15), Viva (20) | Total (60) |
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| MBA BUSINESS ANALYTICS, VISTAS<br>UNIVERSITY LAB EXAMINATION  |                                 |              |   |
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| ANSWER ALL THE<br>QUESTIONS (60 MARKS)  |                                 |              |   |
| REGISTER NUMBER   | 23316109                        | NAME         | LOKESH KUMAR D H                            |
| SUBJECT CODE  | 23PMBN12                        | SUBJECT NAME | DATA VISUALIZATION USING R AND PYTHON (IBM) |
| DEGREE/BRANCH   | MBA BUSINESS ANALYTICS          | TIME & DATE  | 09.30 AM & 05.12.23                         |
| <p>To Create a data frame and do the following operations using tidyr package.</p> <p>i)gather   ii) spread   iii) separate   iv) unite</p> |                                 |              |   |
| Aim, algorithm and Explanation (25)   | Output & RESULT (15), Viva (20) | Total (60)   |   |
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| MBA BUSINESS ANALYTICS, VISTAS<br>UNIVERSITY LAB EXAMINATION  |  |                |   |
|---|--|----------------|---|
| ANSWER ALL THE<br>QUESTIONS (60 MARKS)  |  |                |   |
| REGISTER NUMBER   | 23316110                                 | NAME           | MERLIN JOSEPHINA E                                |
| SUBJECT CODE  | 23PMBN12                                 | SUBJECT NAME   | DATA VISUALIZATION<br>USING R AND PYTHON<br>(IBM) |
| DEGREE/BRANCH   | MBA BUSINESS<br>ANALYTICS                | TIME &<br>DATE | 09.30 AM & 05.12.23                               |
| <p>To Do the data manipulation operations for the iris and air quality dataset using data. table package and obtain the results for the following functions.</p> <ol style="list-style-type: none"> <li>Select a subset row</li> <li>Select a column with particular values</li> <li>Select columns with multiple values</li> <li>Select a column to return a vector</li> <li>Select multiple columns</li> <li>Returns the sum and standard deviation</li> <li>Sum of selected columns</li> </ol> |  |                |   |
| Aim, algor,ithm and<br>Explanation (25)   | Output &<br>RESULT<br>(15),<br>Viva (20) | Total (60)     |   |
|   |  |                |   |

**MBA BUSINESS ANALYTICS, VISTAS  
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**ANSWER ALL THE  
QUESTIONS (60 MARKS)**

|                 |                        |              |   |
|-----------------|------------------------|--------------|---|
| REGISTER NUMBER | 23316111               | NAME         | MOHANARAM A                                 |
| SUBJECT CODE    | 23PMBN12               | SUBJECT NAME | DATA VISUALIZATION USING R AND PYTHON (IBM) |
| DEGREE/BRANCH   | MBA BUSINESS ANALYTICS | TIME & DATE  | 09.30 AM & 05.12.23                         |

5. To do the different visualization types for air quality data set using the ggplot package in R.

- a. Line graph
- b. Bar graph
- c. Histogram
- d. Scatter plot
- e. Pie chart

|                                     |                                 |            |
|-------------------------------------|---------------------------------|------------|
| Aim, algorithm and Explanation (25) | Output & RESULT (15), Viva (20) | Total (60) |
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| <b>MBA BUSINESS ANALYTICS, VISTAS</b><br><b>UNIVERSITY LAB EXAMINATION</b>            |                                 |              |   |
| <b>ANSWER ALL THE QUESTIONS (60 MARKS)</b>  |                                 |              |   |
| REGISTER NUMBER   | 23316112                        | NAME         | NAVAGEEVAN G                                |
| SUBJECT CODE  | 23PMBN12                        | SUBJECT NAME | DATA VISUALIZATION USING R AND PYTHON (IBM) |
| DEGREE/BRANCH   | MBA BUSINESS ANALYTICS          | TIME & DATE  | 09.30 AM & 05.12.23                         |
| <p>To write a Program to create maps with markers and Chropleth maps with Folium.</p> |                                 |              |   |
| Aim, algorithm and Explanation (25)   | Output & RESULT (15), Viva (20) | Total (60)   |   |
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**MBA BUSINESS ANALYTICS, VISTAS  
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**ANSWER ALL THE  
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|                 |                        |              |   |
|-----------------|------------------------|--------------|---|
| REGISTER NUMBER | 23316113               | NAME         | NAVEEN VIKASH R                             |
| SUBJECT CODE    | 23PMBN12               | SUBJECT NAME | DATA VISUALIZATION USING R AND PYTHON (IBM) |
| DEGREE/BRANCH   | MBA BUSINESS ANALYTICS | TIME & DATE  | 09.30 AM & 05.12.23                         |

To create different types of graphs for user inputs.

- a) Line graph
- b) Line Graph with style
- c) Bar Graph (Horizontal and vertical)
- d) Histogram
- e) Scatter Plot.

a) Line graph

### b) Line Graph with style

c) Bar Graph (Horizontal and vertical)      d) Histogram

e) Scatter Plot.

|                                     |                                 |            |
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| Aim, algorithm and Explanation (25) | Output & RESULT (15), Viva (20) | Total (60) |
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|                 |                        |              |   |
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| REGISTER NUMBER | 23316114               | NAME         | PARANTHAMAN S                               |
| SUBJECT CODE    | 23PMBN12               | SUBJECT NAME | DATA VISUALIZATION USING R AND PYTHON (IBM) |
| DEGREE/BRANCH   | MBA BUSINESS ANALYTICS | TIME & DATE  | 09.30 AM & 05.12.23                         |

To Do the data manipulation operations for the iris and mtcars dataset using the dplyr package and obtain the results for the following functions.

i)filter ii) select iii) arrange iv) summarize v) mutate

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| <b>MBA BUSINESS ANALYTICS, VISTAS</b><br><b>UNIVERSITY LAB EXAMINATION</b>   |                                 |              |   |
| <b>ANSWER ALL THE QUESTIONS (60 MARKS)</b>   |                                 |              |   |
| REGISTER NUMBER  | 23316115                        | NAME         | PAVITHRA S                                  |
| SUBJECT CODE   | 23PMBN12                        | SUBJECT NAME | DATA VISUALIZATION USING R AND PYTHON (IBM) |
| DEGREE/BRANCH  | MBA BUSINESS ANALYTICS          | TIME & DATE  | 09.30 AM & 05.12.23                         |
| <p>To Create a data frame and do the following operations using tidyr package.</p> <p>i)gather    ii) spread    iii) separate    iv) unite</p> |                                 |              |   |
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**ANSWER ALL THE  
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|-----------------|------------------------|--------------|---|
| REGISTER NUMBER | 23316116               | NAME         | PRAVEENA B                                  |
| SUBJECT CODE    | 23PMBN12               | SUBJECT NAME | DATA VISUALIZATION USING R AND PYTHON (IBM) |
| DEGREE/BRANCH   | MBA BUSINESS ANALYTICS | TIME & DATE  | 09.30 AM & 05.12.23                         |

To Do the data manipulation operations for the iris and air quality dataset using data. table package and obtain the results for the following functions.

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|-----------------|------------------------|--------------|---|
| REGISTER NUMBER | 23316117               | NAME         | RAGUL D                                     |
| SUBJECT CODE    | 23PMBN12               | SUBJECT NAME | DATA VISUALIZATION USING R AND PYTHON (IBM) |
| DEGREE/BRANCH   | MBA BUSINESS ANALYTICS | TIME & DATE  | 09.30 AM & 05.12.23                         |

To do the different visualization types for air quality data set using the ggplot package in R.

- a. Line graph
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|                                     |                                    |            |
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|-----------------|------------------------|--------------|---|
| REGISTER NUMBER | 23316118               | NAME         | RAJKUMAR S                                  |
| SUBJECT CODE    | 23PMBN12               | SUBJECT NAME | DATA VISUALIZATION USING R AND PYTHON (IBM) |
| DEGREE/BRANCH   | MBA BUSINESS ANALYTICS | TIME & DATE  | 09.30 AM & 05.12.23                         |

To write a Program to create maps with markers and Chropleth maps with Folium.

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|-----------------|------------------------|--------------|---|
| REGISTER NUMBER | 23316119               | NAME         | SANJEEVIRAM R P                             |
| SUBJECT CODE    | 23PMBN12               | SUBJECT NAME | DATA VISUALIZATION USING R AND PYTHON (IBM) |
| DEGREE/BRANCH   | MBA BUSINESS ANALYTICS | TIME & DATE  | 09.30 AM & 05.12.23                         |

To create different types of graphs for user inputs.

- a) Line graph
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a) Line graph

### b) Line Graph with style

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|                                     |                                 |            |
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**ANSWER ALL THE  
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|                 |                        |              |   |
|-----------------|------------------------|--------------|---|
| REGISTER NUMBER | 23316120               | NAME         | SATHISH KUMAR K                             |
| SUBJECT CODE    | 23PMBN12               | SUBJECT NAME | DATA VISUALIZATION USING R AND PYTHON (IBM) |
| DEGREE/BRANCH   | MBA BUSINESS ANALYTICS | TIME & DATE  | 09.30 AM & 05.12.23                         |

To Do the data manipulation operations for the iris and mtcars dataset using the dplyr package and obtain the results for the following functions.

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**ANSWER ALL THE  
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|                 |                        |              |   |
|-----------------|------------------------|--------------|---|
| REGISTER NUMBER | 23316121               | NAME         | SHARON CARMEL L                             |
| SUBJECT CODE    | 23PMBN12               | SUBJECT NAME | DATA VISUALIZATION USING R AND PYTHON (IBM) |
| DEGREE/BRANCH   | MBA BUSINESS ANALYTICS | TIME & DATE  | 09.30 AM & 05.12.23                         |

To Create a data frame and do the following operations using tidyr package.

i)gather    ii) spread    iii) separate    iv) unite

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|                 |                        |              |   |
|-----------------|------------------------|--------------|---|
| REGISTER NUMBER | 23316122               | NAME         | SUWEKA SUYAMBURAJ                           |
| SUBJECT CODE    | 23PMBN12               | SUBJECT NAME | DATA VISUALIZATION USING R AND PYTHON (IBM) |
| DEGREE/BRANCH   | MBA BUSINESS ANALYTICS | TIME & DATE  | 09.30 AM & 05.12.23                         |

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|                 |                        |              |   |
|-----------------|------------------------|--------------|---|
| REGISTER NUMBER | 23316123               | NAME         | TARIQ ANWAR A                               |
| SUBJECT CODE    | 23PMBN12               | SUBJECT NAME | DATA VISUALIZATION USING R AND PYTHON (IBM) |
| DEGREE/BRANCH   | MBA BUSINESS ANALYTICS | TIME & DATE  | 09.30 AM & 05.12.23                         |

To do the different visualization types for air quality data set using the ggplot package in R.

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|-----------------|------------------------|--------------|---|
| REGISTER NUMBER | 23316124               | NAME         | VASANTHA LAXMI S                            |
| SUBJECT CODE    | 23PMBN12               | SUBJECT NAME | DATA VISUALIZATION USING R AND PYTHON (IBM) |
| DEGREE/BRANCH   | MBA BUSINESS ANALYTICS | TIME & DATE  | 09.30 AM & 05.12.23                         |

To write a Program to create maps with markers and Chropleth maps with Folium.

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| <b>MBA BUSINESS ANALYTICS, VISTAS</b><br><b>UNIVERSITY LAB EXAMINATION</b> |
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**ANSWER ALL THE  
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| REGISTER NUMBER | 23316125               | NAME         | ARUN RAJ M                                  |
| SUBJECT CODE    | 23PMBN12               | SUBJECT NAME | DATA VISUALIZATION USING R AND PYTHON (IBM) |
| DEGREE/BRANCH   | MBA BUSINESS ANALYTICS | TIME & DATE  | 09.30 AM & 05.12.23                         |

To create different types of graphs for user inputs.

- a) Line graph
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a) Line graph

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### c) Bar Graph (Horizontal and vertical)

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| <b>MBA BUSINESS ANALYTICS, VISTAS</b><br><b>UNIVERSITY LAB EXAMINATION</b>   |                                 |              |   |
| <b>ANSWER ALL THE QUESTIONS (60 MARKS)</b>   |                                 |              |   |
| REGISTER NUMBER  | 23316126                        | NAME         | ELAVARASI V                                 |
| SUBJECT CODE   | 23PMBN12                        | SUBJECT NAME | DATA VISUALIZATION USING R AND PYTHON (IBM) |
| DEGREE/BRANCH  | MBA BUSINESS ANALYTICS          | TIME & DATE  | 09.30 AM & 05.12.23                         |
| <p>To Do the data manipulation operations for the iris and mtcars dataset using the dplyr package and obtain the results for the following functions.</p> <p>i)filter   ii) select   iii) arrange   iv) summarize   v) mutate</p> <p>•</p> |                                 |              |   |
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|-----------------|------------------------|--------------|---|
| REGISTER NUMBER | 23316127               | NAME         | HARITHA N                                   |
| SUBJECT CODE    | 23PMBN12               | SUBJECT NAME | DATA VISUALIZATION USING R AND PYTHON (IBM) |
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To Create a data frame and do the following operations using tidyr package.

i)gather    ii) spread    iii) separate    iv) unite

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|                                     |                                 |            |

**MBA BUSINESS ANALYTICS, VISTAS  
UNIVERSITY LAB EXAMINATION**

**ANSWER ALL THE  
QUESTIONS (60 MARKS)**

|                 |                        |              |   |
|-----------------|------------------------|--------------|---|
| REGISTER NUMBER | 23316128               | NAME         | KEERTHI A                                   |
| SUBJECT CODE    | 23PMBN12               | SUBJECT NAME | DATA VISUALIZATION USING R AND PYTHON (IBM) |
| DEGREE/BRANCH   | MBA BUSINESS ANALYTICS | TIME & DATE  | 09.30 AM & 05.12.23                         |

To Do the data manipulation operations for the iris and air quality dataset using data.table package and obtain the results for the following functions.

- a. Select a subset row
- b. Select a column with particular values
- c. Select columns with multiple values
- d. Select a column to return a vector
- e. Select multiple columns
- f. Returns the sum and standard deviation
- g. Sum of selected columns

|                                     |                                    |            |
|-------------------------------------|------------------------------------|------------|
| Aim, algorithm and Explanation (25) | Output & RESULT (15),<br>Viva (20) | Total (60) |
|                                     |                                    |            |

**MBA BUSINESS ANALYTICS, VISTAS  
UNIVERSITY LAB EXAMINATION**

**ANSWER ALL THE  
QUESTIONS (60 MARKS)**

|                 |                        |              |   |
|-----------------|------------------------|--------------|---|
| REGISTER NUMBER | 23316129               | NAME         | RITHIKA A                                   |
| SUBJECT CODE    | 23PMBN12               | SUBJECT NAME | DATA VISUALIZATION USING R AND PYTHON (IBM) |
| DEGREE/BRANCH   | MBA BUSINESS ANALYTICS | TIME & DATE  | 09.30 AM & 05.12.23                         |

To do the different visualization types for air quality data set using the ggplot package in R.

- a. Line graph
- b. Bar graph
- c. Histogram
- d. Scatter plot
- e. Pie chart

|                                     |                                 |            |
|-------------------------------------|---------------------------------|------------|
| Aim, algorithm and Explanation (25) | Output & RESULT (15), Viva (20) | Total (60) |
|                                     |                                 |            |

|   |                                 |              |   |
|---|---------------------------------|--------------|---|
| <b>MBA BUSINESS ANALYTICS, VISTAS</b><br><b>UNIVERSITY LAB EXAMINATION</b>            |                                 |              |   |
| <b>ANSWER ALL THE</b><br><b>QUESTIONS (60 MARKS)</b>                                  |                                 |              |   |
| REGISTER NUMBER   | 23316130                        | NAME         | SHRUTHIKA A                                 |
| SUBJECT CODE  | 23PMBN12                        | SUBJECT NAME | DATA VISUALIZATION USING R AND PYTHON (IBM) |
| DEGREE/BRANCH   | MBA BUSINESS ANALYTICS          | TIME & DATE  | 09.30 AM & 05.12.23                         |
| <p>To write a Program to create maps with markers and Chropleth maps with Folium.</p> |                                 |              |   |
| Aim, algorithm and Explanation (25)   | Output & RESULT (15), Viva (20) | Total (60)   |   |
|   |                                 |              |   |

**MBA BUSINESS ANALYTICS, VISTAS**  
**UNIVERSITY LAB EXAMINATION**

**ANSWER ALL THE  
QUESTIONS (60 MARKS)**

|                 |                        |              |   |
|-----------------|------------------------|--------------|---|
| REGISTER NUMBER | 23316131               | NAME         | SUSHMA SUBASHINI S                          |
| SUBJECT CODE    | 23PMBN12               | SUBJECT NAME | DATA VISUALIZATION USING R AND PYTHON (IBM) |
| DEGREE/BRANCH   | MBA BUSINESS ANALYTICS | TIME & DATE  | 09.30 AM & 05.12.23                         |

To create different types of graphs for user inputs.

- a) Line graph
- b) Line Graph with style
- c) Bar Graph (Horizontal and vertical)
- d) Histogram
- e) Scatter Plot.

|                                     |                                 |            |
|-------------------------------------|---------------------------------|------------|
| Aim, algorithm and Explanation (25) | Output & RESULT (15), Viva (20) | Total (60) |
|                                     |                                 |            |