PART A
1. Identify two benefits of using data visualization in data analysis
2. What is meant by 'data transformation'?
3. Define : Data validation
4. Define data analysis. List two tools for data analysis.
5. List any two methods of data collection.
6. Define data visualization with two advantages.What is data abstraction?
7. Name two common techniques for handling missing data .
8. How to check data validation in data analysis?
9. List any two qualitative and quantitative data collection methods?
10. Define data visualization?
11. Define a point technique in visualization?
12. State the purpose of Vector Visualization.
13. List the categorical color map.
14. List out techniques for scalar visualisation.
15. List out techniques for vector visualisation.
16. What is the difference between scalar and vector visualization techniques?
17. What are visual variables in data visualization? Give two examples.
18. State the method used for visualizing matrix data.
19. Write the two common method for handling missing data?

PART B

20. Describe the difference between a bar chart and a histogram.
21. Create a bar chart using the provided dataset to display the sales figures for the past year.
22. What is data preparation? Discuss the steps of data preparation?
23. Analysis about the Levels of data validation?
24. Illustrate the functions of Numpy and matplot lib
25. Identify two benefits of using data visualization in data analysis
26. Define data validation.
27. Explain different stages of Data Preparation.
28. Demonstrate a 2-D numpy array and check the shape(using python).
29. List any three benefits of Data preparation.
30. Explain how can you remove duplicates from a data frame while transforming data (using python).
31. Recall which function will you use to create dummy variables during data transformation.
32. Explain different types of data collection.
33. Illustrate a simple line plot by taking a suitable data (using python).
34. Demonstrate how can you fill missing values in a data frame column named as 'MRP' with a value 88 (using python).
35. Explain four levels of Data validation.
36. Illustrate a simple bar graph using suitable data (using python).
37. Differenntiate between data cleaning and data transformation process.
38. Explain the different methods of data collection.
39. How does the choice of data collection method impact data quality and analysis?
40. Describe the process of data cleaning and preparation.

41. Why data cleaning is important, and list out the key challenges faced during data cleaning?
42. Write a Python program to construct a DataFrame and apply data transformation techniques to prepare the dataset for handling missing values, encoding of categorical data.
43. Discuss various visualization techniques for hierarchical structures.
44. Explain the concepts of data abstraction & task abstraction in detail.
45. Write a python program to Create a bar chart using the provided dataset to display the sales figures for the past year.
46. Discuss the four levels for validation in data analysis. Why validation is the essential part of the data analysis process?
47. Illustrate the functions of Numpy and matplot lib python libraries.
48. What is data preparation? Discuss the steps of data preparation?
49. Develop a new visualization method to better represent a complex dataset. Explain your design choices.
50. How is data visualization utilized in the healthcare industry?
51. What is Heat map. Also discuss about heat map visualization.
52. Explain with suitable example of visual variables
53. Explain colour mapping technique of scalar visualisation with formula.
54. Define transfer function with respective to scalar visualisation.
55. List out examples for 2-D color contouring visulaization.
56. Demonstrate different techniques of filling missing values using pandas in python.
57. Explain contouring technique of scalar data visualisation.
58. Which function do we use to read csv files using pandas in python.
59. Explain vector glyphs with examples.
60. Define vector color coding.
61. Illustrate how can we split a data frame and make groups and use aggregate function with them during data wrangling (take suitable example and use python).
62. Explain height plots with formula and examples.
63. Explain space filling method of visualising hierarchical structures through rectangular layouts.
64. Which function do we use to read excel files using pandas in python.
65. Explain the Vector color coding technique with neat diagram.
66. State the significance of HSV in Vector color visualization.
67. Explain the difference between Space filling method and Non space filling method.
68. Illustrate the tree drawing step by step approach in Non-Space Filling Methods.
69. Explain the concept of heat maps, how they work, and where they are typically applied.
70. Explain scalar visualization using contouring techniques with suitable example of 2D & 3D platform.
71. Define the term Space filling method. And draw the tree map using the space filling method
72. Discuss the view in interactive data visualization tools is a key feature in exploring datasets.
73. Explain with suitable example of visual variables
74. Explain the concept of heat maps, how they work, and where they are typically applied.

Numpy

1) Creating int and checking type

```
num = -8
print(type(num))
output:

<class 'int'>
```

2) Performing arithmetic Operations on int type

```
a = 5
b = 6

# Addition
c = a + b
print("Addition:",c)

d = 9
e = 6

# Subtraction
f = d - e
print("Subtraction:",f)

g = 8
h = 2

# Division
i = g // h
print("Division:",i)

j = 3
k = 5

# Multiplication
l = j * k
print("Multiplication:",l)

m = 25
n = 5
```

```python
# Modulus
o = m % n

print("Modulus:",o)


p = 6
q = 2

# Exponent
r = p ** q
print("Exponent:",r)
```
output:

```
Addition: 11
Subtraction: 3
Division: 4
Multiplication: 15
Modulus: 0
Exponent: 36
```

3) Mean

```python
import numpy

speed = [99,86,87,88,111,86,103,87,94,78,77,85,86]

x = numpy.mean(speed)

print(x)
```
output:

```
89.76923076923077
```

4) Median

```python
import numpy

speed = [99,86,87,88,111,86,103,87,94,78,77,85,86]

x = numpy.median(speed)

print(x)
```
output:

```
87.0
```

5) Mode

```python
from scipy import stats

speed = [99,86,87,88,111,86,103,87,94,78,77,85,86]

x = stats.mode(speed)

print(x)
```

output:

```
ModeResult(mode=86, count=3)
```

6) addition of two arrays

```python
import numpy as np

# Element-wise addition between NumPy arrays
arr1 = np.array([3, 2, 1])
arr2 = np.array([1, 2, 3])
out_arr = arr1 + arr2
print(out_arr)
```

output:

```
[4 4 4]
```

7) addition of two matrix

```python
# Program to add two matrices using nested loop
X = [[1, 2, 3],
     [4, 5, 6],
     [7, 8, 9]]

Y = [[9, 8, 7],
     [6, 5, 4],
     [3, 2, 1]]

result = [[0, 0, 0],
          [0, 0, 0],
          [0, 0, 0]]
```

```python
# iterate through rows
for i in range(len(X)):
    # iterate through columns
    for j in range(len(X[0])):
        result[i][j] = X[i][j] + Y[i][j]

for r in result:
    print(r)
```

output:

```
[10, 10, 10]
[10, 10, 10]
[10, 10, 10]
```

```python
# iterate through rows
for i in range(len(X)):
    # iterate through columns
    for j in range(len(X[0])):
```