

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR (AUTONOMOUS)

Siddharth Nagar, Narayanavanam Road – 517583

**QUESTION BANK (DESCRIPTIVE)****Subject with Code:** Data Analytics using R (20CI0607)**Course & Branch:** B.Tech & CSIT**Year & Sem:** III & II**Regulation:** R20**UNIT – I****INTRODUCTION TO DATA ANALYTICS, BASIC STATISTICS**

1	a)	(i) Define Data. (ii) Explain Big Data.	[L1][CO1]	[6M]
	b)	Explain the needs of Data Analytics.	[L2][CO1]	[6M]
2		Explain the Applications of Data Analytics.	[L2][CO1]	[12M]
3	a)	Define Data Sets.	[L1][CO1]	[6M]
	b)	Explain about the tools used for Data Analytics.	[L2][CO1]	[6M]
4	a)	Explain the Characteristics of Big Data mode in detail.	[L2][CO1]	[6M]
	b)	Explain the benefits of Big Data.	[L2][CO1]	[6M]
5	a)	Explain the following with an example: (i) Mean (ii) Median (iii) Mode	[L2][CO1]	[8M]
	b)	Find the mean, median and mode of the following data: 23, 57, 24, 49, 31, 37, 10, 30, 57, 40, 35, 16, 57, 29, 03, 40.	[L3][CO1]	[4M]
6	a)	Explain the following: (i) Standard Deviation (ii) Variance	[L2][CO1]	[8M]
	b)	If a die is rolled, then find the variance and standard deviation of the possibilities.	[L3][CO1]	[4M]
7		Explain Correlation and its types in brief.	[L2][CO1]	[12M]
8	a)	Explain the Normal Distribution in detail.	[L2][CO1]	[6M]
	b)	Explain the Binomial Distribution in detail.	[L2][CO1]	[6M]
9		The scores for nine students in history and algebra are as follows: History: 35, 23, 47, 17, 10, 43, 9, 6, 28 Algebra: 30, 33, 45, 23, 8, 49, 12, 4, 31 Compute the Spearman rank correlation.	[L3][CO1]	[12M]
10	a)	Explain the following Correlations: (i) Spearman Correlation (ii) Pearson Correlation	[L2][CO1]	[6M]
	b)	Suppose the current annual salary of all teachers in the United States have a normal distribution with a mean of 51000 dollars and a standard deviation of 6000 dollars. Find the probability that the annual salary of a randomly selected teacher would be between 42000 and 65000.	[L3][CO1]	[6M]

UNIT – II
BASIC ANALYSIS TECHNIQUES, DATA ANALYSIS TECHNIQUES,
INTRODUCTION TO R, R DATA STRUCTURES

1	a)	Explain the Chi-Square test in detail.	[L2][CO2]	[6M]
	b)	Explain the T-test in detail.	[L2][CO2]	[6M]
2	a)	Discuss in detail about the Linear regression.	[L2][CO2]	[6M]
	b)	Discuss in detail about the Logistic regression.	[L2][CO2]	[6M]
3	a)	What is R ? Explain the history and evolution of R in detail.	[L1][CO2]	[8M]
	b)	List out some packages in R.	[L1][CO2]	[4M]
4	a)	Explain the steps involved in Installation of R and R-studio in brief.	[L2][CO2]	[6M]
	b)	Explain the features of R.	[L2][CO2]	[6M]
5		Explain about the different sections of the control panel in R-studio.	[L2][CO2]	[12M]
6	a)	Explain and compare command line and scripts in R.	[L2][CO2]	[6M]
	b)	Discuss in detail about the comments in R.	[L2][CO2]	[6M]
7		Explain the different functions of Variables in R.	[L2][CO2]	[12M]
8		Explain the different types of Operators in R.	[L2][CO2]	[12M]
9	a)	Explain following Data structures: (i) Vectors (ii) Character Strings	[L2][CO2]	[6M]
	b)	Explain following Data structures: (i) Matrices (ii) Lists	[L2][CO2]	[6M]
10	a)	Explain following Data structures: (i) Data Frames (ii) Classes	[L2][CO2]	[6M]
	b)	Write a R program to do all the arithmetic operations.	[L6][CO2]	[6M]

UNIT – III
**INPUT OF DATA, OUTPUT FUNCTIONS, IN-BUILT FUNCTIONS IN R,
 USER DEFINED FUNCTIONS, DECISION MAKING STRUCTURE, LOOPS**

1	a)	Illustrate the input statements with example.	[L2][CO3]	[6M]
	b)	Illustrate the output statements with example.	[L2][CO3]	[6M]
2		Explain the objects in R language with appropriate examples.	[L2][CO3]	[12M]
3	a)	Write a R program to find sum of natural numbers.	[L6][CO3]	[6M]
	b)	Write a R program to find whether a given number is even or odd.	[L6][CO3]	[6M]
4	a)	Write a R program to find factorial of a given number.	[L6][CO3]	[6M]
	b)	Create a R program to display Fibonacci series.	[L6][CO3]	[6M]
5		Explain the following in-built functions with examples: i) Mathematical functions ii) String functions	[L2][CO3]	[12M]
6	a)	Define function and explain the types of functions.	[L2][CO3]	[6M]
	b)	Express function to do all arithmetic operations.	[L2][CO3]	[6M]
7	a)	Explain user-defined functions with examples.	[L2][CO3]	[6M]
	b)	Explain switch statement with an example.	[L2][CO3]	[6M]
8		List different decision making statements in R with appropriate examples.	[L1][CO3]	[12M]
9	a)	Explain the break and next statements in R with an example.	[L2][CO3]	[6M]
	b)	Write a R program to count the number of even number using for loop.	[L2][CO3]	[6M]
10		Examine the syntax of the following statements with an example program. i) for loop ii) while loop iii) repeat loop	[L4][CO3]	[12M]

UNIT – IV
DATA TYPES OF R VECTORS, COMMON VECTOR OPERATIONS,
MATRICES, ARRAYS

1	a)	What is a vector in R ? Explain classes and elements of a vector.	[L1][CO4]	[6M]
	b)	How to access the elements of a vector ?	[L2][CO4]	[6M]
2	a)	Explain the arithmetic & logical operations in vector data type in R with examples.	[L2][CO4]	[6M]
	b)	Explain vector indexing with an example.	[L2][CO4]	[6M]
3	a)	Explain the following functions with an example: i) all() ii) any()	[L2][CO4]	[6M]
	b)	Explain the Vectorized operations in detail.	[L2][CO4]	[6M]
4	a)	Explain the NA and NULL values and compare them with an example.	[L2][CO4]	[8M]
	b)	Write a R program to obtain the length of the vector.	[L6][CO4]	[4M]
5		Explain the functions of Vectors in R.	[L2][CO4]	[12M]
6	a)	What is a matrix in R ? Explain how to create a matrix.	[L1][CO4]	[6M]
	b)	Explain how to access the elements of an matrix with an example.	[L2][CO4]	[6M]
7	a)	Explain the functions of the matrix in detail.	[L2][CO4]	[6M]
	b)	Explain Matrix Indexing in detail.	[L2][CO4]	[6M]
8	a)	Explain filtering on Matrix with suitable examples	[L2][CO4]	[6M]
	b)	Create a vector with some of your friend's names i. Get the length of above vector. ii. Get the first two friends from above vector. iii. Get the 2nd and 3rd friends. iv. Sort your friends by names using 2 methods.	[L6][CO4]	[6M]
9	a)	What is an Array in R ? Explain How to create an array.	[L1][CO4]	[6M]
	b)	Explain how to access the elements of an array.	[L2][CO4]	[6M]
10		Write a R program to create two 2x3 matrix and add, subtract, multiply and divide the matrixes.	[L6][CO4]	[12M]

UNIT – V
LISTS, IMPORT AND EXPORT OF DATA,
DATA VISUALIZATION TECHNIQUES

1	a)	What is a list in R ? Explain how to create a list with an example.	[L1][CO5]	[6M]												
	b)	How to access the elements of a list ?	[L2][CO5]	[6M]												
2	a)	Explain some operations of list data type in R with examples.	[L2][CO5]	[6M]												
	b)	Explain list indexing with an example.	[L2][CO5]	[6M]												
3	a)	Explain the following functions for list with an example: i) lapply() ii) sapply()	[L2][CO5]	[6M]												
	b)	Explain how to add and delete the elements of a list with an example.	[L2][CO5]	[6M]												
4	a)	Explain how to read data from excel files with an example.	[L2][CO5]	[6M]												
	b)	Explain how to write data into excel files with an example.	[L2][CO5]	[6M]												
5		Explain the Import & Export of data in excel files with suitable examples.	[L2][CO5]	[12M]												
6	a)	Define Data Visualization and Explain some data visualization techniques in brief.	[L1][CO5]	[6M]												
	b)	Explain why R is preferred over Python in data visualization.	[L2][CO5]	[6M]												
7		Explain the following techniques with syntax and example. i. Pie chart ii. Scatter	[L2][CO5]	[12M]												
8		Explain the following techniques with syntax and example. i. Bar chart ii. Box plots	[L2][CO5]	[12M]												
9	a)	Explain how to add label, title and colors in the Bar chart with an example.	[L2][CO5]	[6M]												
	b)	Explain how to add title and colors in the Pie chart with an example.	[L2][CO5]	[6M]												
10		Convert the following details into Pie chart and Bar chart:	[L2][CO5]	[12M]												
		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;">City</td> <td style="width: 12.5%;">London</td> <td style="width: 12.5%;">Dubai</td> <td style="width: 12.5%;">New York</td> <td style="width: 12.5%;">Mumbai</td> <td style="width: 12.5%;">Singapore</td> </tr> <tr> <td>Temperature (°C)</td> <td>11</td> <td>35</td> <td>0</td> <td>32</td> <td>26</td> </tr> </table>	City	London	Dubai	New York	Mumbai	Singapore	Temperature (°C)	11	35	0	32	26		
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