

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI  
(END SEMESTER EXAMINATION)**

**CLASS: MSc.  
BRANCH: BIOINFORMATICS & COMPUTATIONAL BIOLOGY**

**SEMESTER : II  
SESSION : SP/2024**

**SUBJECT: BI204 DATA ANALYTICS USING R**

**TIME: 3 Hours**

**FULL MARKS: 50**

**INSTRUCTIONS:**

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
  2. Attempt all questions.
  3. The missing data, if any, may be assumed suitably.
  4. Before attempting the question paper, be sure that you have got the correct question paper.
  5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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Q.1(a)	Illustrate the data types of R in detail with example.	[5]	CO	BL
Q.1(b)	Differentiate between Vector, List, Matrix, and Data frame in R with suitable example.	[5]	CO1	BL1
			CO1	BL2
Q.2 (a)	A girl collects points in a game as follows (25,28,26,30,40,50,40) and finds the skewness of the given Data.	[5]	CO3	BL3
Q.2 (b)	How do you create a contingency table in R? What statistics are summarized in a contingency table? Explain with an example.	[5]	CO3	BL2
Q.3 (a)	Show the relationship between two categorical data with suitable example.	[5]	CO1	BL1
Q.3 (b)	How we perform data transformation by normalization. Explain Min _Max technique.	[5]	CO2	BL3
Q.4(a)	How we do the hypothesis testing. Explain null and alternate hypothesis.	[5]	CO3	BL4
	A light bulb manufacturer claims that its' energy saving light bulbs last an average of 60 days. Set up a hypothesis test to check this claim and comment on what sort of test we need to use.			
Q.4(b)	How are random samples generated? Explain different types of random sampling with suitable example.	[5]	CO4	BL2B L2
Q.5(a)	How does the DESeq2 package in R handle normalization and differential expression analysis for RNA-Seq data?	[5]	CO2	BL1
Q.5(b)	How do different representation styles in protein structural visualization highlight specific features of a protein structure while de-emphasizing others?	[5]	CO5	BL2

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