

K. J. Somaiya Institute of Technology, Sion, Mumbai-22  
(Autonomous College Affiliated to University of Mumbai)

<b>April – May 2024</b>		
<b>(B.Tech) Program: Artificial Intelligence &amp; Data Science</b>		<b>Scheme: II</b>
<b>Examination: TY</b>		<b>Semester: VI</b>
<b>Course Code: AIC603</b>	<b>Course Name: Data Analytics &amp; Visualization</b>	
<b>Date of Exam: 27/05/2024</b>	<b>Duration: 2.5 Hours</b>	<b>Max. Marks: 60</b>

**Instructions:**

- (1) All questions are compulsory.
- (2) Draw neat diagrams wherever applicable.
- (3) Assume suitable data, if necessary.

		Max. Marks	CO	BT level
Q 1	<b>Solve any six questions out of eight:</b>	12		
i)	Define Analysis of Variance (ANOVA).	2	CO2	U
ii)	What are the key features of D3.JS	2	CO4	U
iii)	Justify the need of data joins in visualization.	2	CO5	An
iv)	Define qualitative and quantitative data. Give an example.	2	CO1	U
v)	Explain in brief Area Chart	2	CO3	U
vi)	Justify the need of Chi square test in data analysis.	2	CO2	An
vii)	List the libraries that can be used for image data.	2	CO3	U
viii)	Justify the need of transitions in data.	2	CO6	An
<b>Q.2</b>	<b>Solve any four questions out of six.</b>	<b>16</b>		
i)	What are the different statistical errors that occur in hypothetical testing?	4	CO2	U
ii)	Explain in detail the observation method in detail.	4	CO1	U
iii)	How can you use keys to improve the efficiency of updating a chart in D3.js?	4	CO5	U
iv)	Write short note on: Allowing the user to interrupt the play sequence	4	CO6	U

v)	write a sample code using HTML5 Canvas (500 X 500) to generate 2D square with 200 X200 filled with red colour.	4	CO4	Ap																								
vi)	Explain in detail text data preprocessing.	4	CO3	U																								
<b>Q.3</b>	<b>Solve any two questions out of three.</b>	<b>16</b>																										
i)	Explain in detail: Bubble Charts, Surface Charts	8	CO3	U																								
ii)	<p>Explain different data collection methods. A recent issue of Fortune Magazine reported that the following companies had lowest sales per employee among the companies.</p> <table border="1"> <thead> <tr> <th>Stock</th> <th>Annual Sales (in million)</th> <th>Earnings per share (\$)</th> <th>Exchange (where to trade)</th> </tr> </thead> <tbody> <tr> <td>Cache Inc.</td> <td>86.6</td> <td>0.25</td> <td>OTC</td> </tr> <tr> <td>Koss Corp</td> <td>36.1</td> <td>0.89</td> <td>OTC</td> </tr> <tr> <td>Par Technology</td> <td>81.2</td> <td>0.32</td> <td>NYSE</td> </tr> <tr> <td>Scientific Tech.</td> <td>17.3</td> <td>0.46</td> <td>OTC</td> </tr> <tr> <td>Western Beef</td> <td>273.7</td> <td>0.78</td> <td>OTC</td> </tr> </tbody> </table> <p>(a) How many elements are in the data set? Write down these elements. (b) How many variables are in the data set? Write down these variables. (c) How many observations are in the data set? Write down these observations. (d) Which of the above variables are qualitative and which are quantitative?</p>	Stock	Annual Sales (in million)	Earnings per share (\$)	Exchange (where to trade)	Cache Inc.	86.6	0.25	OTC	Koss Corp	36.1	0.89	OTC	Par Technology	81.2	0.32	NYSE	Scientific Tech.	17.3	0.46	OTC	Western Beef	273.7	0.78	OTC	8	CO2	Ap
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iii)	Justify, "Interactive buttons, updating charts, and adding transitions are all important techniques for creating dynamic and engaging data visualizations with D3.js". Write a code for interactive buttons using D3.js.	8	CO6	An																								
<b>Q.4</b>	<b>Solve any two questions out of three.</b>	<b>16</b>																										
i)	Write and Explain a code for simple line chart using CanvasJS chart.	8	CO4	Ap																								
ii)	Justify the purpose of using d3.selectAll() to select multiple elements at once, and how do you use it in practice? Explain it with code for multiple circles with increasing order radius, filled with blue color.	8	CO5	An																								
iii)	Explain in detail Missing data treatments	8	CO7	U																								

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