

# Sardar Patel Institute of Technology

Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai-400058, India

(Autonomous College Affiliated to University of Mumbai)

ESE

May- 2023

Max. Marks: 100

Duration: 3.00 hrs.

Class: S.Y. MCA

Semester: III

Course Code:MC513

Branch: M.C.A.

Name of the Course: Design Visualization and Analytics

Instruction:

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

Q. No.	Questions	Max. Marks	CO-BL
Q1 A)	What is Time Series Analysis? Explain the different components of it in terms of time, duration, visualization, nature, and predictability.	10	2-3
B)	Describe Binomial Distribution with an example. Describe the conditions under which the Binomial distribution can be applied with the justifications.	10	2-4
Q2 A)	Explain Correlation Analysis with its types.	10	3-3

<b>B)</b>	What is Histogram? Write a python code to draw the histogram between two variables.	<b>10</b>	<b>3-4</b>
<b>Q3 A)</b>	<p>The percentage of orders filled correctly at Wendy's was approximately 86.8%. Suppose that you go to the drive-through window at Wendy's and place an order. Two friends of yours independently place orders at the drive-through window at the same Wendy's.</p> <p>What are the probabilities that</p> <p>a) all three filled correctly?</p> <p>b) none of the three filled correctly?</p> <p>c) at least two of the three orders will be filled correctly?</p> <p>d) what is the mean and standard deviation of the orders filled correctly?</p>	<b>10</b>	<b>1-3</b>
<b>B)</b>	What are univariate, bivariate, and multivariate Analysis? What graphs are used for univariate, bivariate, and multivariate Analysis? Write the python code for each.	<b>10</b>	<b>1-3</b>
<b>Q4A)</b>	What is Tableau? Describe its features, advantages, and disadvantages.	<b>10</b>	<b>4-3</b>
<b>B)</b>	<p>i) Give some data visualization examples using following visual variables</p> <ol style="list-style-type: none"> <li>1. shape</li> <li>2. orientation</li> <li>3. color</li> <li>4. texture</li> <li>5. value</li> <li>6. size</li> <li>7. Position</li> <li>8. order</li> </ol> <p>ii) Arrange the steps in data visualization</p> <ol style="list-style-type: none"> <li>1. Define a clear purpose.</li> <li>2. Keep visualizations simple.</li> </ol>	<b>5+5</b>	<b>1-2</b>

	3. Make it actionable. 4. Provide context 5. Know your audience 6. Choose the right visual. 7. Make sure your visualizations are inclusive.																										
<b>Q5 A)</b>	<p><b>Dataset Details:</b> The dataset to be used for the quiz pertains to the number of hospitalisations under the scheme Ayushman Bharat - Pradhan. The data contains number of cases of hospitalisation in public and private hospitalisations state/ UT wise and on an all India level. PMJAY is a scheme which provides health cover of Rs. 5 Lakhs per family per year, for secondary and tertiary care hospitalization across public and private empaneled hospitals in India. State/UT contains the list of states and union territories, Public column contains hospitalisations in public hospitals and Private column contains list of hospitalisations in private hospitals.*</p> <p><b>Columns: State/UT, Private, Public</b></p> <p><b>Sample data is shown below.</b></p> <table> <tr> <th></th><th>State/UT</th><th>Private</th><th>Public</th></tr> <tr> <td>0</td><td>Andaman and Nicobar Islands</td><td>1.0</td><td>21.0</td></tr> <tr> <td>1</td><td>Andhra Pradesh</td><td>97863.0</td><td>34385.0</td></tr> <tr> <td>2</td><td>Arunachal Pradesh</td><td>5.0</td><td>630.0</td></tr> <tr> <td>3</td><td>Assam</td><td>14350.0</td><td>33553.0</td></tr> <tr> <td>4</td><td>Bihar</td><td>11747.0</td><td>34814.0</td></tr> </table> <p><b>Write a python code to answer below questions based on the above dataset.</b></p> <p>i) How many rows and columns does the data set have?*</p> <p>ii) Create a new column Total which contains a sum of private and public hospitalisations. So the column Total should be a summation of the two columns Public and Private.</p> <p>iii) Which State or UT is the unhealthiest? (i.e. maximum number of hospitalisations) HINT : Do not include Grand Total</p> <p>iv) Which States/UTs have more than 50000 hospital. Give the statistical summary of data.</p>		State/UT	Private	Public	0	Andaman and Nicobar Islands	1.0	21.0	1	Andhra Pradesh	97863.0	34385.0	2	Arunachal Pradesh	5.0	630.0	3	Assam	14350.0	33553.0	4	Bihar	11747.0	34814.0	<b>10</b>	<b>4-4</b>
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<b>B)</b>	<p>Consider the Titanic dataset on next page.</p> <p>Apply the techniques to analyze the data and draw the insights based on given data. (5 insights)</p>	<b>10</b>	<b>3-4</b>																								



Titanic Dataset

pclass	survived	sex	age	sibsp	parch	embarked	boat	body	home.dest
1	0	male		0	0	S			London, England
1	1	female	31	0	0	C	3		
1	1	male		0	0	S	D		London, England
1	0	male	62	0	0	S			Halifax, NS
1	1	female	36	0	0	C	8		New York, NY / Washington, DC
2	0	male	30	1	0	C			Russia New York, NY
2	1	female	28	1	0	C	10		Russia New York, NY
2	0	male	30	0	0	S			Bryn Mawr, PA, USA
2	0	male	18	0	0	S			Buenos Aires, Argentina / New Jersey, NJ
2	0	male	25	0	0	S			Cornwall, England Houghton, MI
2	0	male	34	1	0	S			Warwick, England
2	1	female	36	1	0	S	11		Warwick, England
2	0	male	57	0	0	S			West Hoboken, NJ
2	0	male	18	0	0	S			Penzance, Cornwall / Akron, OH
2	0	male	23	0	0	S			Guernsey
2	1	female	36	0	0	S	10		Bristol, Avon / Jacksonville, FL
2	0	male	28	0	0	S			Plymouth, Dorset / Houghton, MI
2	0	male	51	0	0	S		174	Jacksonville, FL
2	1	male	32	1	0	S	13		Norwich / New York, NY
2	1	female	19	1	0	S	13		Norwich / New York, NY
2	0	male	28	0	0	S			England
2	1	male	1	2	1	S	11		Guntur, India / Benton Harbour, MI
2	1	female	4	2	1	S	11		Guntur, India / Benton Harbour, MI
2	1	female	12	2	1	S	13		Guntur, India / Benton Harbour, MI
2	1	female	36	0	3	S	11		Guntur, India / Benton Harbour, MI
2	1	male	34	0	0	S	13		London
2	1	female	19	0	0	S	12		Rochester, NY
2	0	male	23	0	0	S			St Ives, Cornwall / Calumet, MI
3	0	male	31	0	0	Q			Philadelphia, PA
3	0	male	31	0	0	Q			Ireland Brooklyn, NY
3	1	female	22	0	0	Q	13		Ireland
3	0	female	30	0	0	Q			Ireland
3	0	male	70.5	0	0	Q		171	
3	0	male	43	0	0	S			
3	0	male	35	0	0	S			Austria
3	0	male	27	0	0	S			Austria
3	0	male	19	0	0	S			Austria