


Name:																									
Enrolment No:																									
UPES End Semester Examination, December 2023																									
Course : Research Methodology Semester: III Program: M.Sc. (H) Chemistry / M.Sc. (H) Physics Time : 03 hrs. Course Code: PHYS8020																									
			Max. Marks: 100																						
Instructions: Scientific Calculator is allowed																									
SECTION A																									
S. No.		Marks	CO																						
Q 1	Enlist different types of IPRs.	4	CO1																						
Q 2	Differentiate between stratified sampling and cluster sampling.	4	CO2																						
Q 3	Define study variable and explanatory variable.	2 + 2	CO3																						
Q 4	Comment on the significance of bibliography in report writing.	4	CO1																						
Q 5	Calculate the correlation coefficient for the following data: <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>X</td> <td>5</td> <td>10</td> <td>15</td> <td>20</td> <td>25</td> <td>30</td> <td>35</td> <td>40</td> <td>45</td> <td>50</td> </tr> <tr> <td>Y</td> <td>55</td> <td>43</td> <td>39</td> <td>34</td> <td>35</td> <td>38</td> <td>44</td> <td>47</td> <td>49</td> <td>54</td> </tr> </table>	X	5	10	15	20	25	30	35	40	45	50	Y	55	43	39	34	35	38	44	47	49	54	4	CO2
X	5	10	15	20	25	30	35	40	45	50															
Y	55	43	39	34	35	38	44	47	49	54															
SECTION B																									
Q 6	Elaborate the meaning of ‘property’ in Intellectual Property Rights (IPR).	10	CO1																						
Q 7	a) The procedure of testing hypothesis requires a researcher to adopt several steps. Describe in detail all the steps involved in hypothesis testing. b) A manufacturer of ball pens claims that a certain pen he manufactures has a mean writing life of 500 pages with a standard deviation of 30 pages. A purchasing agent selects a sample of 100 pens and puts them for test. The mean writing life for the sample was 390 pages. Should the purchasing agent reject the manufactures claim, given that the critical value of the test at 1% significance level is 2.58?	5 + 5	CO3																						

Q 8	Bring out the differences and similarities between skewness and kurtosis as a measure of dispersion.	10	CO2
Q 9	Explain non-probability sampling techniques in detail. OR Elaborate non-comparative scaling techniques.	10	CO2
SECTION-C			
Q 10	a) Discuss the features of the research report. b) Elaborate various types of measurement scales used in research.	10 + 10	CO1
Q 11	a) Give details on the applications of Chi-square tests. b) Outline the conditions under which χ^2 test is applied. OR a) Explain a method to test the hypothesis for proportion. b) Write a note on 'path analysis' under multivariate techniques for regression analysis.	10 + 10	CO3