


Name:			
Enrolment No:			
UNIVERSITY OF PETROLEUM AND ENERGY STUDIES End Semester Examination, December 2022			
Course: Research Methodology Program: M.Sc. (Chemistry/Physics) Course Code: PHYS 8020		Semester: III Time : 03 hrs. Max. Marks: 100	
Instructions: Not Applicable			
SECTION A (5Qx4M=20Marks)			
S. No.		Marks	CO
Q 1	a) Define the term 'Research statement' b) Differentiate between copyright and trademark	2 x 2 = 4	CO1
Q 2	Draw a Research process flowchart highlighting the importance of research design	4	CO1
Q 3	Illustrate the layout of a research report	4	CO3
Q 4	Comment on the sources of sampling errors in data measurement	4	CO2
Q 5	The procedure of testing hypothesis requires a researcher to adopt several steps. Describe in detail all the steps involved in hypothesis testing	4	CO2
SECTION B (4Qx10M= 40 Marks)			
Q 1	Define skewness in the data and discuss a common method of measuring it.	4 + 6 = 10	CO2
Q 2	Clarify how patents serve as an exclusive right to the applicant	10	CO1
Q 3	Discuss a Least Square Estimation model for regression analysis	10	CO3
Q 4	Compare Karl Pearson's coefficient and Spearman's coefficient OR Explain a method to test the hypothesis for mean	10	CO2
SECTION-C (2Qx20M=40 Marks)			
Q 1	a) Briefly describe Path Analysis as a multivariate technique	2 x 10 = 20	CO3

	<p>b) Write a short note on the usage of ANOVA in linear regression analysis</p> <p style="text-align: center;">OR</p> <p>a) Elaborate the features of a Research report b) Illustrate the importance of bibliography in context with research report</p>		
Q 2	<p>a) Highlight the common characteristics of IPR b) Discuss different research designs in detail</p>	2 x 10 = 20	CO1