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GANDHI INSTITUTE OF ENGINEERING AND TECHNOLOGY UNIVERSITY, ODISHA, GUNUPUR

(GIET UNIVERSITY)

Ph.D. (First Semester-Winter) Examinations, June – 2025

23SPPCRM1010 / 23WPPCRM1010 – Research Methodology

(Common to all branches)

Time: 3 hrs Maximum: 70 Marks

The figures in the right hand margin indicate marks.

Answer *ANY FIVE* Questions. **(14 x 5 = 70 Marks)**

		Marks
1.a.	Explain with a block diagram the different stages of a research process.	8
b.	Discuss the criteria of a good research. "A problem well-defined is problem half solved"- clarify the statement.	6
2.a.	Compare and contrast applied research and fundamental research.	7
b.	List and explain various scaling techniques with their merits and demerits.	7
3.a.	Define research. Write the scope of research in brief.	7
b.	What is Qualitative research? How does it differ from Quantitative research?	7
4.a.	Define Data collection. Briefly described the data collection procedure.	8
b.	Compare and contrast between an experiment and survey	6
5.a.	Define analysis of variance. State its assumptions. Explain how inference is drawn from ANOVA table.	6
b.	Following are the details of sales effected by three sales persons in three doors to door campaigns:	8

Sales Persons	Sales in door-to-door campaign			
A	8	9	5	10
B	7	6	6	9
C	6	6	7	5

Construct an ANOVA table and find out whether there is any significant difference in the performance of the sales persons.

6.a.	Consider the following data on sales (X) and profit(Y):							8

X	5	6	7	8	9	10	11
Y	2	4	5	5	3	8	7

Determine the regression of profit on sales.

b.	If the simple correlation coefficients have the values $r_{12} = 0.6$, $r_{13} = 0.65$, $r_{23} = 0.8$. Find the multiple correlation coefficient $R_{1.32} = 0.6$.	6
7.a.	Distinguish between probability and non-probability sampling.	

b. In an anti-diabetes campaign in an identified area a particular medicine, say X was administered to 812 persons out of a total population of 3248.The number of diabetes castes is shown below:

Treatment	Diabetes	No diabetes	Total
Medicine X	20	792	812
No Medicine	220	2216	2436
Total	240	3008	3248

Discuss the usefulness of medicine X in checking diabetes. (Apply χ^2Test).

8. Write short notes on: 4+5+5

i. Problem Identification
ii. Literature review
iii. Report writing

---End of Paper---

CHI-SQUARE

SIGNIFICANT VALUES χ^2 (α) OF CHI-SQUARE DISTRIBUTION RIGHT TAIL AREAS FOR GIVEN PROBABILITYα,

$$P = P_r\ (x^2 > x^2(\alpha) = \alpha$$

Degree of freedom (ν)	*Probability (Level of significance)*						
	0 = .99	*0.95*	*0.50*	*0.10*	*0.05*	*0.02*	*0.01*
1	.000157	.00393	.455	2.706	3.841	5.214	6.635
2	.0201	.103	1.386	4.605	5.991	7.824	9.210
3	.115	.352	2.366	6.251	7.815	9.837	11.341
4	.297	.711	3.357	7.779	9.488	11.668	13.277
5	.554	1.145	4.351	9.236	11.070	13.388	15.086
6	.872	2.635	5.348	10.645	12.592	15.033	16.812
7	1.239	2.167	6.346	12.017	14.067	16.622	18.475
8	1.646	2.733	7.344	13.362	15.507	18.168	20.090
9	2.088	3.325	8.343	14.684	16.919	19.679	21.669
10	2.558	3.940	9.340	15.987	18.307	21.161	23.209