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Total Number of Pages :2

M.TECH

M.TECH 3<sup>RD</sup> SEMESTER REGULAR EXAMINATIONS, NOV 2019

RESEARCH METHODOLOGY

Common to MD/TE

Subject Code:MMDOE3022/MTEOE3022

Time: 3 Hours

Max Marks : 70  
(10 X 2=20 MARKS)PART-A

1. Answer the following questions.

- What are the basic types of research?
- Why determination of sample design is required in research?
- What is the role of literature survey in research?
- What are the different applications of Chi-square test?
- Distinguish between t-test and z-test?
- What are the advantages of non-parametric test and name the different types of non-parametric tests.
- What are the variables used in multivariate analysis?
- Write the significance of factor analysis.
- Write the mathematical formulation of principal components method of factor analysis.
- State the different important parametric tests in hypothesis testing.

PART-B

(5 X 10=50 MARKS)

Answer any five questions from the following.

- 2.a What is a research problem? State the components of research problem 5
- b Data collection is the backbone of research. Discuss about the various techniques used for data collection. 5
- 3.a Empirical research in India in particular creates so many problems for the researchers". State the problems that are usually faced by such researchers 5
- b What is meaning of probability sampling? Discuss about simple random sampling, systematic sampling and stratified sampling. 5
- 4.a A farmer grows crops on two fields A and B. On A he puts Rs. 10 worth of manure per acre and on B Rs 20 worth. The net returns per acre exclusive of the cost of manure on the two fields in the five years are: 10
 

<i>Year</i>	1	2	3	4	5
<i>Field A, Rs per acre</i>	34	28	42	37	44
<i>Field B, Rs per acre</i>	36	33	48	38	50

Other things being equal, discuss the question whether it is likely to pay the farmer to continue the more expensive dressing. Test at 5% level of significance.
- 5.a Explain the meaning of analysis of variance. Describe briefly the technique of analysis of variance for one-way and two-way classifications. 5
- b State the basic assumptions of the analysis of variance. 5
- 6.a What is the significance of using multiple discriminant analysis? Explain in brief the technical 5



details involved in such a technique.

- b Name the important multivariate techniques and explain the important characteristics of each one of such techniques. 5
- 7.a Given is the following correlation matrix,  $R$ , relating to eight variables with unities in the diagonal spaces: relating to eight variables with unities in the diagonal spaces: 10

		<i>Variables</i>							
		1	2	3	4	5	6	7	8
<i>Variables</i>	1.000	.709	.204	.081	.626	.113	.155	.774	
	.709	1.00	.051	.089	.581	.098	.083	.652	
	.204	.051	1.00	.671	.123	.689	.582	.072	
	.081	.089	.671	1.000	.022	.798	.613	.111	
	.626	.581	.123	.022	1.00	.047	.201	.724	
	.113	.098	.689	.798	.047	1.00	.801	.120	
	.155	.083	.582	.613	.201	.801	1.00	.152	
	.774	.652	.072	.111	.724	.120	.152	1.00	

Using the centroid method of factor analysis, work out the first and second centroid factors from the above information.

8. Write short notes on
- a Systematic and stratified sampling; 5
- b Cluster and area sampling. 5

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