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Register Number:……..…

M.E M.TECH DEGREE EXAMINATIONS: NOV/DEC 2023

(Regulation 2018)

First Semester

COMMON TO BIO / DS / EST

P18INT0001**:** Research Methodology and Statistics

COURSE OUTCOMES

CO1: Understand and apply the concepts of research.

CO2: Apply statistical and other research tools to analyze and interpret data.

CO3: Demonstrate skills in writing research topics.

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Which one among the following statements is correct in context to research? CO1 [K_2]

a) Research refers to a series of systematic activity or activities undertaken to find out the solution to a problem.

b) It is a systematic, logical and unbiased process wherein verification of hypotheses, data analysis, interpretation and formation of principles can be done.

c) It is an intellectual inquiry or quest towards truth,

d) It enhances knowledge.

a) a), b), c) and d) b) c), a) and b)

c) a) and b) d) Only a)

2. What is the name of the conceptual framework in which the research is carried out? CO1 [K_2]

a) Research hypothesis b) Synopsis of Research

c) Research paradigm d) Research design

3. To test null hypothesis, a researcher uses: CO2 [K_1]

a) t test b) ANOVA

c) X^2 d) factorial analysis

4. Match the research concept with corresponding description: CO3 [K_2]

List I	List II
A.Hypothesis	i.It is a statistical test that does not make assumptions about the parameter
B.Sample	ii.Device using which data are collected in research
C.Research Tool	iii.A subset drawn from large set to represent it
D.Non Paramtetric Test	iv.A tentative statement indictaing the relationship between two or more variables

a) A-iv, B iii, C-ii, D-i
b) A-i, B-iii, C-iii,D iv
c) A-ii, B-i, C-iv, D-iii
d) A-iii, B-iv, C-i, D-ii.

5. What type of chart is useful for showing trends or changes over time? CO2 [K_3]

a) Pie Chart
b) Column Chart
c) Line Chart
d) Dot Graph

6. In order to pursue the research, which of the following is priorly required? CO3 [K_1]

a) Developing a research design
b) Formulating a research question
c) Deciding about the data analysis procedure
d) Formulating a research hypothesis

7. Assertion (A): The purpose of the research is also to revisit the situations in a bid to ensure needed amelioration and improvement. CO3 [K_2]

Reason (R): Action research is a format of research that is basically directed at bettering the situations.

a) Both A and R are true and R is the correct explanation of A
b) Both A and R are true and R is the not correct explanation of A
c) A is true R is false
d) A is true but R is false

8. The degree of freedom for paired t-test based on n pairs of observations is: CO2 [K_3]

a) 2n - 1
b) n - 2
c) 2(n - 1)
d) n – 1

9. Which of the following is true regarding research objectives? CO3 [K_2]

a) Research objectives, when achieved, will provide sufficient earnings to obtain a reasonable return on
b) Research objectives, when obtained, will ensure the viability of the marketing

investment.

c) Research objectives, when achieved, provide the information necessary to solve the problem

d) Research objectives are seldom achieved but should be stated as goals to be sought.

10. What are the core elements of a dissertation? CO3 [K_3]

a) Introduction; Data Collection; Data Analysis; Conclusions and Recommendations

b) Executive Summary; Literature Review; Data Gathered; Conclusions; Bibliography

c) Research Plan; Research Data; Analysis; References

d) Introduction; Literature Review; Research Methodology; Results; Discussions and Conclusions

PART B (10 x 2 = 20 Marks)

11.	Discuss the importance of Literature search in research.	CO1	[K_2]
12.	Mention how the Hypotheses is generated and evaluated.	CO1	[K_2]
13.	Summarize how to Identify the dependent and independent variable	CO2	[K_2]
14.	Distinguish between random sampling and non-random sampling.	CO2	[K_1]
15.	Mention the dangers involved in statistical inferences.	CO2	[K_2]
16.	Describe the application of statistical software SPSS	CO2	[K_3]
17.	Describe the uses of computer system in patient medication profiles and give its advantages.	CO3	[K_2]
18.	Analyze the Methods of Collecting Primary Data	CO3	[K_3]
19.	List the any four different types of report in science and Technology	CO3	[K_2]
20.	What is citing reference? Explain with example	CO3	[K_1]

PART C (6 x 5 = 30 Marks)

21.	Examine the various steps involved in Scientific Research and analyse how a research scholar should oversight the research planning.	CO1	[K_4]
22.	Discuss the factors with examples that are to be considered for identifying a data collection method for Research.	CO1	[K_3]
23.	Enumerate the conditions in which a) Paired and unpaired *t* test b) Parametric and non- parametric tests c) One way and two way ANOVA tests should be selected	CO2	[K_3]

24.	Examine the role of Pilot Studies and Pre-tests in large scale production of any secondary metabolites.	CO2	[K_4]
25.	Conclude with suitable example the different statistical parameters used in epidemiology study.	CO3	[K4]
26.	Describe in detail the characteristics of good report writing	CO3	[K_3]

Answer any FOUR Questions
PART D (4 x 10 = 40 Marks)

27.	Describe in detail the Purpose of the Research and How to formulate the research objectives.	CO1	[K_4]
28.	Examine what is data and what are different types of data? Explain in detail with examples different types of data.	CO1	[K_3]
29.	Enumerate the difference between Null Hypothesis and Alternative Hypothesis? Explain with Suitable Example	CO2	[K_4]
30.	Classify the various types and methods of research available. Discuss the ethical practices to be followed in scientific research.	CO3	[K_4]
31.	Justify with suitable examples the Structure and Components of a Biotechnology Research thesis	CO3	[K_3]

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