

TMP161030A

Reg. No:

Name:

M. Phil. DEGREE EXAMINATION, MARCH 2017
SEMESTER I - PHYSICS
PH1C1MP – RESEARCH METHODOLOGY

Time: Three Hours

Maximum Marks: 75

PART A

I. Answer any nine questions. Each question carries 5 marks.

1. Illustrate different steps involved in the formulation of a research problem.
2. Discuss how variables are identified in a research problem.
3. Distinguish between deductive and inductive methods of research.
4. Explain how LaTeX helps in preparing scientific documents.
5. Explain how the quality of research paper can be evaluated using various indices.
6. Write a note on academic plagiarism and steps to avoid plagiarism in science reporting.
7. How does SPSS help in research data analysis?
8. Distinguish between mean and variance of a distribution. Calculate the variance of the following distribution :

Trial Number	1	2	3	4	5
Measured value	71	72	72	73	71

9. Explain how the acceptability of a measured value is determined. What is meant by confidence interval?
10. Describe the creation of a two – dimensional array using MATLAB. Write MATLAB a program to solve the following system of linear equations:

$$4x - 2y + 6z = 8$$

$$2x + 8y + 2z = 4$$

$$6x + 10y + 3z = 0$$

11. Write a python program to sum odd numbers from 1 to a given number n .
12. Discuss different conditional statements in python with suitable examples.

(9x5=45)

PART B

II. Answer all questions. Each question carries 15 marks.

13. Discuss the construction and testing of hypotheses in research.

OR

What are various types of reporting in research? Illustrate and composition of a research thesis.

14. Explain the need of statistical data analysis in physical science research. Show how various errors are minimized by statistical tools.

OR

Distinguish between built – in functions and user – defined functions in MATLAB, with the help of suitable examples. Create a function in MATLAB to calculate the mean and standard deviation of a given data.

(2x15=30)