

Roll No.

Y-2522

26/15

M. Phil. EXAMINATION, 2015

MATHEMATICS

Paper First

(Research Methodology, Quantitative Techniques and Computers)

Time : Three Hours]

[Maximum Marks : 100

Note : Attempt any *two* parts from each question. Solve all questions. All questions carry equal marks.

Unit—I

1. (a) What is the difference between descriptive and analytical research ?
- (b) What do you mean by Research ? Write a note on significance of research.
- (c) What do you mean by Research Ethics ? According to Betrayers what are the topics that can be considered as fraud ?

Unit—II

2. (a) Write a note on importance of clarity and simplicity in scientific writing.
- (b) Justify that Science is a political enterprise.
- (c) Explain various types of technical science writing.

Unit—III

3. (a) What do you mean by mathematics subject classification ? Write a note on importance of indexing and use of mathematics subject classification.
- (b) Write a note on the impact of e-resources in mathematical research.
- (c) Write down the structure of a standard mathematical research paper.

Unit—IV

4. (a) Explain minipage environment of latex.
- (b) Write down syntax with example for typesetting the following in the LATEX :
- (i) equation
 - (ii) multiline equation
 - (iii) cases
 - (iv) stackrel
 - (v) atop
- (c) Explain nine parameters of newtheoremstyle command.

Unit—V

5. (a) Write code in MATLAB to solve the following system of linear equations using matrix operations :

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

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

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

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- (b) Write down syntax to plot Sphere, Cylinder and 3-D Bar in MATLAB.
- (c) For a matrix A, explain the following commands :
- (i) $A(:,n)$
 - (ii) $A(n,:)$
 - (iii) $A(:,m:n)$
 - (iv) $A(m:n,:)$
 - (v) $A(m:n, p:q)$