

[This question paper contains 2 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 278

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Unique Paper Code : 2353010015

Name of the Paper : Research Methodology

Name of the Course : **Bachelor of Science (Honours Course) / Bachelor of Arts / Bachelor of Science (Programme) – DSE**

Semester : VI

Duration : 3 Hours

Maximum Marks : 90

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt all the **six** questions, selecting any **two** parts from each question.
3. Parts of the question are to be attempted together.
4. All the **six** questions carry equal marks.

1. (a) List and elaborate the general principles of mathematical writing.
(b) What are the various ways for practicing good mathematical judgement? Explain in detail.
(c) What is the format of a mathematical research paper? Suppose that there is a journal called 'XYZ', which publishes research papers in Mathematics. What is the unique international identifier, associated with this journal 'XYZ' called?
2. (a) What are the three questions that should be considered, when formulating a definition in a mathematics research paper? Explain the importance of each of these questions.
(b) State the important points that should be kept in mind, when citing papers/ references in a research paper.
(c) What are the key points that should be taken into consideration, before and after submission of a manuscript to a journal, for possible publication?
3. (a) Explain the use of each of the following LaTeX commands: \label, \ref, and \cite. Give examples for each of the above commands.

P.T.O.

- (b) Write a code in Latex to obtain the following output :

Example of a Theorem Environment

We can now state and use our custom theorem environment.

Theorem 1 (Pythagoras Theorem). *Let a and b be the legs of a triangle of right angles and c be the hypotenuse. Then*

$$c^2 = a^2 + b^2.$$

We can also give a proof using the built-in proof environment:

- (c) What are the *equation* and the *align* environments in LaTeX? Explain the use of each of the two environments. State when, each one should be used.
4. (a) Write PSTricks code to draw a triangle and label its vertices A, B, and C.
- (b) Discuss the important features of a good poster, including content organization, visual design, and readability.
- (c) Make a Beamer presentation on the topic ‘Importance of Mathematical Writing’ with exactly five slides including a title slide, three content slides, and a thank you slide.
5. (a) List any four features of each of the following web resources for Mathematics: AMS and MAA.
- (b) What is meant by JCR? How is the metric ‘impact factor’ of journal, defined as per JCR? Give the purpose and challenges of this journal metric.
- (c) Write a short note on Google Scholar metrics. What are the two main indicators on the basis of which, publications are ranked by Google Scholar metrics. Explain these indicators in brief.
6. (a) What is Scopus? What are the key features of Scopus? What is the importance of Scopus, with respect to the development of research in Mathematics?
- (b) State the research ethics as standardized by COPE, concerning all parties involved in the conduct of research.
- (c) List out the steps/instructions for using the plagiarism checker ‘Turnitin’ software, for finding out the percentage of similarity of a given research paper.