St. Philomena's College (Autonomous),
Bannimantap, Mysuru - 15.

PG Department of Mathematics

A report on extension activity conducted in connection with cracking higher

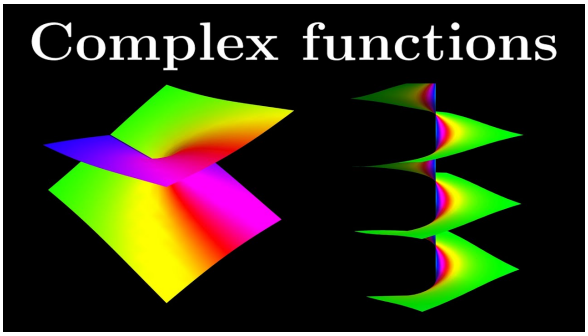
mathematics competitive exams

held on 25-08-2022

Crash Course on Complex Analysis - *Basic ideas and MCQ tackling Techiques*

Resource Person: Mr. Puneeth S,
Assistant Professor,
PG Department of Mathematics,
St. Philomena's College (Autonomous), Bannimantapa , Mysuru.

Venue: Room number 79, PG Block.



Objectives

1) To give basic insights of Complex Analysis.

2) To stress the difference between real and complex number systems.

3) To discuss relevant important aspects of complex analysis in competitive exams.

4) To provide insights on short cut tricks and strategies involved in solving MCQ's .

5) To give hands on practice by discussing pertinent problems.

Outlines of the Session:

• Preliminaries of complex numbers $\mathbb{C}$.

• Eradicating false dogmas in understanding complex numbers - Riemann sheets, Branch Points.

• Important remarks and key points of Complex Analysis.

• Solving problems with strategies like : option elimination, definitions, properties, counter examples

• Assignments and discussions.

With the intention of bringing an innovation, PG Department of Mathematics of St. Philomena's College, organised one day crash course in connection with cracking higher mathematical competitive exams. The soul purpose of this extension activity is to throw light on strategies that are involved in solving MCQ's posed in NBHM, CSIR NET, GATE, SET. The event started with a formal welcome by the HoD, he stressed the importance and opportunities after clearing the exams and the session was handed over to Mr. Puneeth S.

Lecture Session :

Mr. Puneeth.S, who was instrumental in conducting the crash course, began with a very fundamental aspects that made the participants to feel comfortable. After taking the students into confidence, he drove the session from the scratch to the advance level.

He briefed the fundamental aspects related to the properties of complex numbers, analytic functions, harmonic functions, residues, calculus of residues, Cauchy's integral formulas, standard results such as Lioville's theorem, Maximun modulus principle and results related to Bilinear transformations and conformal mappings.

He solved problems related to properties of complex numbers and analytic functions, that set the tone for computational techniques and gave a platform for interaction.

Tutorial Session :

After the lecture session, he briefed out few strategies involved in solving MCQ's and false interpretations that are made by the students in analysing the complex valued functions. He stressed that the complex function is study of two simultaneous real functions and the ideas of real analysis cannot be straight away borrowed in analysing complex functions. He elucidated the above situation by considering the concept of boundedness in $\sin z$ and $\sin x$.

He gave useful suggestions in solving the problems in connection with the topics namely: harmonic functions and its properties, the Milne Thomson's method, residues, calculus of residues, Cauchy's integral theorems, the Lioville's theorem, the maximum modulus principle, bilinear transformations and conformal mappings.

Further, he created a room for interaction by posing assignment questions. In the process of interaction, the faculty members of the department were involved in clearing their doubts.

In conclusion, he suggested useful books for the competitive exams and the online platforms where students can get the pertinent materials in context and acknowledged the management of college for creating opportunity and thanked the student fraternity for their active participation.