8 Sept 2025: Lecture on Finite Element Method by Prof. D N Buragohain arranged by ISSE in association with VJTI Structural Engineering Department.

Prof D N Buragohain's lecture was one of the most memorable lectures in several years. I do not know whether young engineers appreciated it in same way. With million times of computing power in their hands they use brute force methods without second thoughts. However the brute force has its limitations in getting results. The words they should remember are singularity (division by zero error in analysis), hand calculation checks and substructure. When brute force method goes out of hand typical analysis can take several hours. This prevents user to use proper sizing of members and efficiency. I think they need to understand and master all three.

Some of the nuggets I got from the lecture are as follows-

Once you know operating differential equations, getting solutions is easy. This goes beyond the stiffness matrix formation method. It shows his power in looking things in pure mathematics.

Symmetric and anti symmetric boundary conditions.

Least square method for surface modelling and reducing points to elements.

For every problem discussed, there was an independent programming need. The way he achieved shows a mastery over programming.

Using pen plotters to stop hidden lines from appearing- by writing a programme..

Investigating falling concrete in prestressed dome and innovative model with a single compound element joined by interface element to check tension.

His opinion comparison on 8 noded element with triangular element.

The error in reactions with offsetted support condition in STAApro software.

Building configuration with very odd shapes - The problem of "damaged brain type building".

The problem of construction sequence loading on 130 meter arch bridge with steel frame truss and concrete deck. During the concreting in small segments, the loading on the arch was not symmetrical and there was local bending. So the arch could not remain in compression as desired as per design assumptions. This was the lesson learned that

design assumptions may not be valid during actual construction. Finally the steel arch bridge was to be supported by additional supports to complete the work.

His one line answer to two questions raised for solving half the structure due to size limitations and stage construction analysis was - Multiple analysis is required. –

- Note by Pramod Sahastrabuddhe