DEPARTMENT OF CIVIL ENGINEERING, IIT DELHI

MINOR II :CVL756
ADVANCED STRUCTURAL ANALYSIS (2017-18)

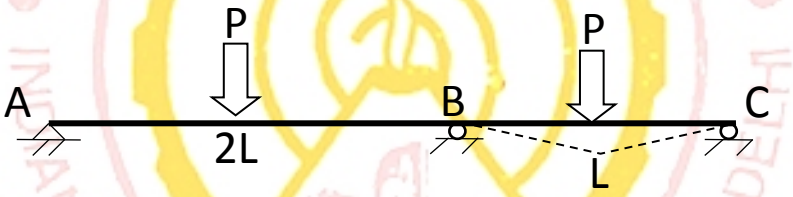
Time allowed: 1hour **Date:** 06 October 2017
Venue: LH 510 **Max marks** : **20**

NOTE: (a) All questions are compulsory. (b) Draw neat and clear sketches wherever required.
(c) Assume suitable data if necessary. (d) Assume members as extensible unless otherwise stated.
(e) All answers must be supported by calculations/ justification to secure assigned marks.

Q1. Why is it necessary to account for floor slab for 3D analysis of a non-symmetrical framed structure? How can the analysis be accurately done if the available program is general 3D analysis with no facility for plate elements?

(5 marks)

Q2. Determine the plastic failure load for the structure shown below for the particular mechanism drawn. Carry out equilibrium and yield checks and comment whether this is the true mechanism?



(10 marks)

Q3. Briefly explain the computational steps involved if for a single storey frame, you need to condense the 3x3 stiffness matrix into 1x1 in terms of the horizontal displacement of the top beam. Assume the members as inextensible and that only horizontal load acts on the frame.

(5 marks)