

DEPARTMENT OF CIVIL ENGINEERING, IIT DELHI

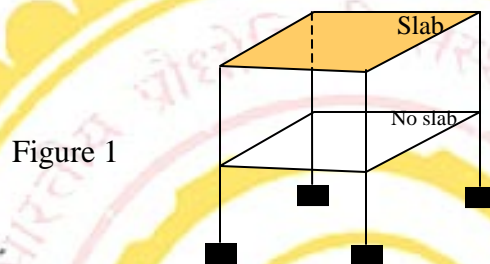
MINOR I :CEL756 ADVANCED STRUCTURAL ANALYSIS (2016-17)

Time allowed: 1 hour
Venue: LH 606

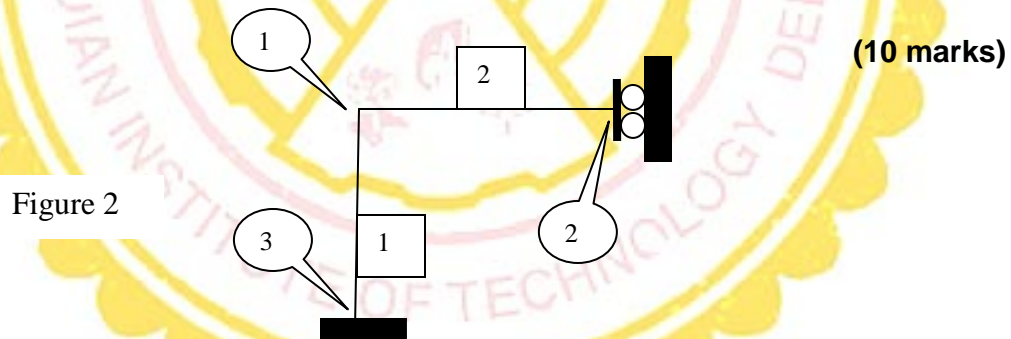
Date: 28 August 2016
Max marks : 20

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. Identify and label the degrees of freedom associated with the 3D structure shown in Figure 1. (3 marks)



Q2. Form the matrix K_{pp} of the structure shown in Figure 2. Assume $(EI/L) = 150$, $(EI/L^2) = 100$, $(EI/L^3) = 50$ and $(EA/L) = 0$. Follow joint and member numbering as indicated. (10 marks)



Q3. Form load vector of the structure shown in Figure 2 if, owing to construction flaw, member 1 is short by 5%. Assume E as 200 GPa, cross sectional area of member to be 1000 mm^2 and member length to be 5 m. (7 marks)