

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST-3 EXAMINATION-2021

B.Tech. 7th Semester

COURSE CODE: 18B1WCE737

MAX. MARKS: 35

COURSE NAME: Finite Element Method

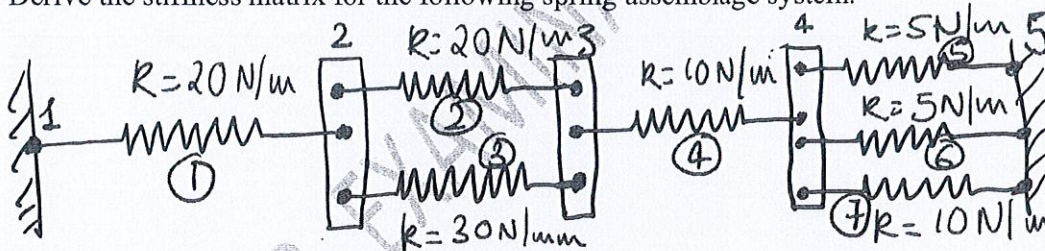
COURSE CREDITS: 3

MAX. TIME: 2 Hours

Instructions:

1. All questions are compulsory.
2. Carrying of mobile phone during examinations will be treated as case of unfair means.
3. Write your name, roll number, and page number on each page submitted.
4. Use of Scientific Calculator is allowed.

1. Derive the Shape Functions and Element Stiffness Matrix of a Beam Element. (10)
2. What is Stability? What are different types of Stability? (5)
3. Derive the stiffness matrix for the following spring assemblage system. (5)



4. Find the rotation at point C in the following beam using: (15)
 - a. Two Beam Elements (Calculator may be used to invert matrix)
 - b. Three Beam Elements (Show steps for matrix inversion)

Compare and discuss the differences between the results obtained from (a) and (b). Assume $EI = 1.2 \times 10^7 \text{ N-m}^2$.

