

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2015

B.Tech.VII/ M.Tech Ist Semester

COURSE CODE: 13M1WCE131

MAX. MARKS: 15

COURSE NAME: FINITE ELEMENT METHOD

COURSE CREDITS: 03

MAX. TIME: 1 HR

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.

Q.1. Explain advantage and disadvantage of Finite Difference Method and Rayleigh Ritz method. (3)

Q.2. Solve the following differential equation by finite difference method. (3)

$$2u''(x) + 3u = 0$$

$$u(1) = 1$$

$$u'(3) = 1 \quad 1 < x < 3$$

Q.3. Find the deflection at $L/4$ of a simply supported beam having concentrated load P at the middle. Use Rayleigh Ritz method. Assume $y = a \sin \frac{\pi x}{L}$ as approximate solution. Also find the % error in the solution. (3)

Q.4. Two trolleys are connected by the arrangement of spring as shown below. Compute the displacement of each trolley and force in the spring by finite element method. Assume $F_1 = 20$ N, $F_2 = 15$ N and $k = 50$ N/mm. (6)

