

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- August 2017

M.Tech . 1st Semester (SE)

COURSE CODE: 11M1WCE114

MAX. MARKS:15

COURSE NAME: **Modeling, Simulation and Computer Applications**

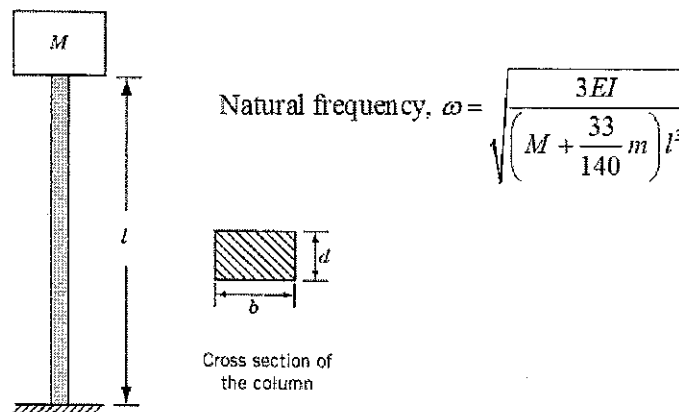
COURSE CREDITS: 03

MAX. TIME: One Hr

**Note:** All questions are compulsory. Every question carries 3 marks.

Carrying of mobile phone during examinations will be treated as case of unfair means.

- Q.1. Give five examples of different engineering problems where modeling and simulation are used extensively.
- Q.2. Compare the deterministic model and stochastic model. If analytical solution for an engineering problem is available, is it better to go for simulation? If yes / no, explain why?
- Q.3. Differentiate between polynomials and posynomials? Give an example of each.
- Q.4. A uniform column of rectangular cross section is to be constructed for supporting a water tank of mass  $M$  (Fig. shown below). It is required (i) to minimize the mass of the column for economy and (ii) to maximize the natural frequency of transverse vibration of the system for avoiding possible resonance due to wind. Formulate the problem of designing the column to avoid failure due to direct compression and buckling. Assume the permissible compressive stress to be  $\sigma_{max}$ . (5)



- Q.5. Give the classification of optimization problems based on nature of the design variables. Also illustrate these problems with an example.

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