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B. Tech. 8th Semester (Civil Engg.) Examination – May, 2023

STRUCTURAL DYNAMICS

Paper : PEC-CEEL-414-G

Time : Three Hours]   *[Maximum Marks : 75*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt *five* questions in all, selecting *one* question from each Section. Question No. 1 is *compulsory*. All questions carry equal marks.

1. Describe the following :   15

   (a) Natural frequency

   (b) Energy principal

   (c) Forced vibration

(d) Application of Newton's law

(e) Rigid foundation

SECTION – A

2. (a) What are differences between static loading and dynamic loading ? 8

(b) Explain the types of excitation. 7

3. The successive amplitude of vibrations of vibratory system as obtained under free vibration are 0.69,0.32,0.19,0.99 units respectively. Determine the damping ratio. 15

SECTION – B

4. Derive the equation of motion for damped force vibrations with constant harmonic excitation of a single degree freedom system. 15

5. What do you mean by multi degree of freedom system and also write the steps for finding the natural frequency. 15

SECTION – C

6. (a) Write the conditions for damping uncoupled. 7

(b) What do you mean by Harmonic fixed excitation with suitable example. 8

7. Explain the lumped mass formulation of dynamics analysis of a based stiffness matrix. 15

SECTION – D

8. Explain the response of continuous system to dynamic load. 15

9. (a) Explain SRSS System. 8

(b) Explain CQC combination of model response. 7

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