

Roll No. ....

**3707**

**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

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P. T. O.

- (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

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- (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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