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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech (Civil Engineering) (2011 onwards) E-I & II (Sem.-7, 8)

DYNAMICS OF STRUCTURES

Subject Code : BTCE-806

M.Code : 71865

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A**1. Answer briefly :**

- a) Write a short note on D' Alembert's Principle.
- b) Compare between free and forced vibration.
- c) What do you mean by damping? What are its forms?
- d) Discuss the significance of periodic loading.
- e) State the principle of virtual displacements.
- f) List different methods to find the mode shapes and frequencies.
- g) Write the formula of Duhamel's integral for dynamic loading.
- h) Differentiate between two DOF and MDOF.
- i) What is resonant frequency ratio?
- j) Write the mathematical equation for equivalent stiffness for springs in parallel and springs in series.

SECTION-B

2. Differentiate between impulsive, periodic and general dynamic loadings.

3. For rectangular forcing function of fig.1 determine the Fourier transform.

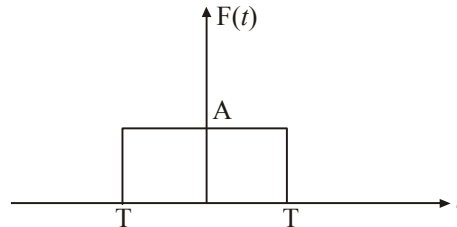


FIG.1

4. Write various steps to complete dynamic response of structure by model superposition techniques with response spectrum method.
5. Explain how mathematical modeling can be done for a multi-degree freedom system.
6. Derive the equation of motion of single degree of freedom system for free vibration and hence find the solution for under damped system.

SECTION-C

7. Describe the Stodola's method for finding frequencies and mode shapes for a vibrating system.
8. Determine the natural frequencies and corresponding mode shapes for the system, shown in fig.2.

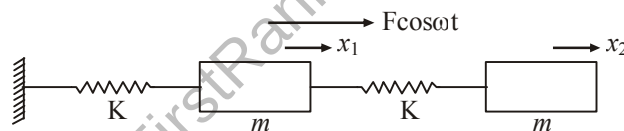


FIG.2

9. Write short notes on :
 - a) Consistent mass and lumped mass.
 - b) Viscous damping and negative damping.
 - c) Duhamel's integral.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.