Total No. of Questions : 8]

SEAT No. :

P4014

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M.E. (Civil Structures)

STRUCTURAL DYNAMICS

(2013 Course) (Semester - I) (End Semester)

Time : 3 Hours] *[Max. Marks :50*

Instructions to the candidates:

1) ***Answer any five questions.***
2) ***Figures to the right indicate full marks.***
3) ***If necessary, assume suitable data and indicate clearly.***
4) ***Use of electronic pocket calculator is allowed.***

Q1) Consider a system of two dampers, with damping constants and arranged in parallel as shown in Fig. 1. The rigid bar to which the two dampers are connected remains horizontal when the force F is zero. Determine the equivalent damping constant of the system. **[10]**

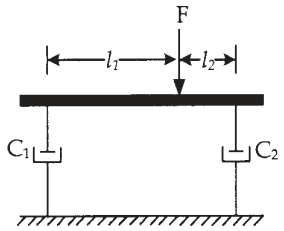

Fig. 1

Q2) Derive the response for a damped SDOF system subjected to an harmonic excitation. **[10]**

Q3) A damped spring-mass system with values of c = 100 kg/s, m = 100 kg, and k = 910 N/m, is subject to a force of 10 cos (3t)N. The system is also subject to initial conditions : x_0 = 1 mm and v_0 = 20 mm/s. Compute the total response, x(t), of the system. **[10]**

Q4) Explain linear acceleration and constant acceleration methods. **[10]**

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Q5) Write the dynamic equation in matrix form for the system shown in Fig.2 and calculate its Eigen values and Eigen vectors. Take m_1 = 1 kg, m_2 = 4 kg, $k_1 = k_3$ = 10 N/m and k_2 = 2 N/m. **[10]**

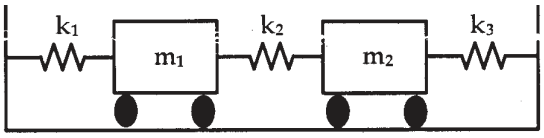

Fig. 2

Q6) Explain step-by-step procedure of Stodola method. **[10]**

Q7) Explain Wilson method. **[10]**

Q8) Determine the response for free longitudinal vibration for a prismatic beam fixed at one end and free at the other. **[10]**