GIET MAIN CAMPUS AUTONOMOUS GUNUPUR – 765022

RM19002044

Registration No: | | | | | | | | | | |

Total Number of Pages : 1 **M.TECH**

M.TECH 2ND SEMESTER (AR 18) REGULAR EXAMINATIONS, APRIL/MAY 2019

STRUCTURAL DYNAMICS

Branch: SE, Subject Code:MSEPC2020

Time: 3 Hours **Max Marks : 70**

PART-A **(10 X 2=20 MARKS)**

1. Answer the following questions.

a) What do you mean by Transient vibration?
b) Define Response Spectra.
c) What do you mean by *Root mean square value*?
d) What is Specific damping capacity?
e) Explain Random time function.
f) What is the standard percentage of damping value considered in structural vibration?
g) State Hamilton's principle.
h) What do you mean by Eigen value?
i) What does the 'transient response' of a system mean?
j) What do you mean by dynamic response factor?

PART-B **(5 X 10=50 MARKS)**

Answer any five questions from the following.

2. (a) Examine whether the log – decrement is also given by the equation $\int = 1/n \log (U_0/ U_n)$ represents the amplitude after n cycles have elapsed. [5]
   (b) A damper offers resistance 0.08 N at a constant velocity 0.06 m/s. the damper is used with a spring of stiffness equal to 12 N/m. Estimate the damping ratio and frequency of the system when the mass of the system is 0.3 kg [5]
3. (a) Explain the important points from transmissibility curves. Draw neat curve. [5]
   (b) An SDOF system consists of a mass of 20 kg, a spring of stiffness 2.2 KN/m and a dash pot with a damping co-efficient of 60 N-s/m is subjected to a harmonic excitation of F = (200 sin 5t) N. show the complete solution of the equation of motion. [5]
4. (a) Write short note on free vibration analysis. [5]
   (b) Elaborate undamped system with an example. [5]
5. (a) What are the steps to be followed to the dynamic analysis of structure? [5]
   (b) How frequency is affected in the free vibration of a shear frame? [5]
6. (a) A spring of stiffness 20 kN/m supports a mass of 4 kg. The mass is pulled down 8 mm and released to produce linear oscillations. Calculate the frequency and periodic time. [5]
   (b) Calculate the displacement, Velocity and acceleration 0.05 s after being released. [5]
7. (a) An object of mass 0.25 kg is suspended by a spring having stiffness of 0.1533 N/mm. determine the natural frequency in cycles/sec. also find it's statically deflection. [5]
   (b) Show that the logarithmic decrement is given by the equation $\S = \frac{1}{n}\ln(\frac{xo}{xn})$, where x_n represents the amplitude after n cycles. [5]
8. Write short notes on
   a) Free vibration analysis [5]
   b) Dynamic equilibrium [5]

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