Total No. of Questions – [8] Total No. of Printed Pages [2]

G.R. No.		P118-114 (BE-FS)

OCT- 2018 / BACKLOG EXAMINATION

F. Y. M. TECH. (SEMESTER - I)

COURSE NAME: STRUCTURAL DYNAMICS COURSE CODE: CVPB11174C

(2017 PATTERN)

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

(*) Instructions to candidates:

1) Answer Q.1 OR Q.2, Q.3 OR Q.4, Q.5 OR Q.6, Q.7 OR Q.8
2) Figures to the right indicate full marks.
3) Use of scientific calculator is allowed
4) Use suitable data where ever required

Q.1) a) Define the following: [6 marks]

(i) Logarithmic decrement ii) Damping ratio iii) Forced vibration

b) The natural frequency of a. spring-mass system is 10 Hz and when extra 3 kg mass is attached to its mass the natural frequency reduces by 2 Hz. Determine the mass and stiffness of the system. [6 marks]

OR

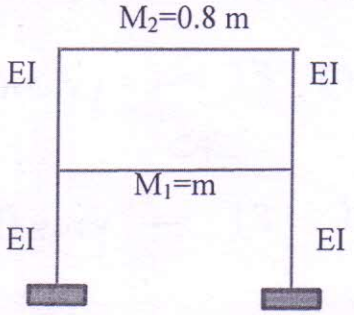
Q.2) a) Write a short note on Duhamel's Integration. Derive the response of SDOF system subjected to constant force. [8 marks]

b) What is magnification factor? Explain its dependency on frequency ratio and damping ratio. [4 marks]

Q.3) Calculate the natural frequency of a cantilever beam of length l and subjected to udl of W KN/m assuming approximate function as that of static deflection curve. [12marks]

OR

Q.4) Calculate the natural frequency and mode shapes for the shear frame as shown below: Assume EI=5 X10^6 Nm^2, m=500X10^3 Ns^2/m, storey height= 4m and span=5m [12 marks]



Q. 5) Derive the formulae for modal masses and modal stiffness for two Degree of Freedom System [13 marks]

OR

Q.6) Derive the Modal participation factors for shear building having two degrees of freedom subjected to ground motion. [13 marks]

Q.7) Determine the natural frequencies and mode shapes for a simply supported beam. Assume distributed mass system [13 marks]

OR

Q.8) Determine the natural frequencies and mode shapes for a fixed beam. Assume distributed mass system [13 marks]