

DEPARTMENT OF CIVIL ENGINEERING



MINOR I :CEL836 STRUCTURAL HEALTH MONITORING (2012-13)

Time allowed: 1hour

Venue : SAL (V 216)

Date : 02 February 2013

Max marks : 15

NOTE: (a) This question paper contains one page only. (b) All questions are compulsory. (c) **Assume any data which you deem is necessary but not supplied.** (d) Draw neat and clear sketches wherever required.

Question 1.

Explain how curvature mode shape can be obtained for a structure using a set of accelerometers. How it can be alternately obtained using a set of PZT patches
(4 marks)

Question 2.

If the resolution of the interrogation system is 0.1 Hz, compute the resolution with which strain can be measured by a vibrating wire strain gauge if a stainless steel wire of length 5cm and diameter 0.1mm is used in it. Density of steel= 7800kg/m³ and Young's modulus of steel = 200 GPa.
(5 marks)

Question 3.

Explain the principle of strain measurement through FBG based fibre optic sensors.
(3 marks)

Question 4.

Explain how the time domain response of a structure subjected to known time history load can be predicted if we have the FRF of the structure.
(5 marks)