

DEPARTMENT OF CIVIL ENGINEERING



MINOR II :CEL836 STRUCTURAL HEALTH MONITORING
(2011-12)

Time allowed: 1hour

Venue : SAL (V 216)

Date : 23 March 2012

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.

Describe how we can obtain curvature mode shape of a flexural member using a pair of piezo-sensors

(3 marks)

Question 2.

What specific characteristic differentiates the damage index method from the methods based on stiffness and flexibility change?

(3 marks)

Question 3.

Describe the principles of the ultrasonic flaw detection. State any three advantages and disadvantages of the technique.

(4 marks)

Question 4.

Derive an expression for the mechanical impedance (1D) of a PZT patch. How can the resonance frequency of a patch be determined?

(4+1 =5 marks)