

DEPARTMENT OF CIVIL ENGINEERING



MAJOR :CEL836 STRUCTURAL HEALTH MONITORING (2012-13)

Time allowed: 2 hours
Venue : SAL (V 216)

Date : 08 May 2013
Max marks : 30

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.

What are the limitations of the 1D impedance model. State the assumptions in the effective impedance approach?

(3+ 3= 6 marks)

Question 2.

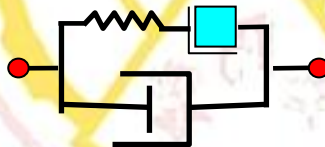
Describe briefly the principle behind the low-cost EMI technique involving a function generator and a digital multimeter. How does it compare with the conventional approach from cost point of view? Is there any limitation associated with this variant?

(3+ 2+2= 7 marks)

Question 3.

Derive an expression for the mechanical impedance of the system shown in Figure below.

(7 marks)



Question 4.

Describe the principle of dye penetration testing.

(3 marks)

Question 5.

In what way the dynamic signal acquired using a PZT patch different from that acquired using an accelerometer?

(3 marks)

Question 6.

How can the bending moment at a section be determined using a pair of strain gauges? State the assumptions clearly

(4 marks)