Time : 3 hrs.

Code No : CE-803/1
Branch : Civil Engg.
Full Marks : 100.

Use separate Answerscripts for each half
The questions are of equal value
Answer <u>six</u> questions taking <u>three</u> from each half
Two marks reserved for neatness of each half.

FIRST HALF

1. a) Derive expressions of strain in terms of displacement .

   b) What is 'compatibility' of strain. Derive the conditions of strain compatibility.

2. a) What is Airy's stress function ? Why it is useful ?

   b) Investigate the problem for which Airy's stress function is given by

   $$\phi = b_2 xy + \frac{d_4}{6} xy^3 .$$

3.   Starting from plate equations in rectangular coordinate obtain plate equation in polar coordinates. Also obtain expressions for moments and shears in polar coordinate.

4.   Find the expression for deflection 'W' of a circular plate of radius 'a' with clamped edges subjected to uniformly distributed load of intensity 'q'.
     Find the value of maximum displacement and the moment values at the center and at the edge of the plate.

5. a) Explain the terms : 'Response Spectra', 'Spectral Displacement' and 'Spectral pseudo-acceleration'.

   b) Show how the equations of motion of MDOF systems can be uncoupled by making use of modal properties.