Total No. of Questions : 6]

SEAT No. :

P4292

[Total No. of Pages :2

[4760] - 52
M.E. (Civil -Structures)
NON-LINEAR ANALYSIS OF STRUCTURE
(2008 Pattern) (Semester - II) (Elective - III) (501411)

Time : 4 Hours] *[Max. Marks : 100*

Instructions to the candidates:

1) ***Answer any two questions from each section.***
2) ***Answer to the two sections should be written in separate books.***
3) ***Figures to the right indicate full marks.***
4) ***Neat diagrams must be drawn wherever necessary.***
5) ***Use of non programmable calculator is allowed.***
6) ***Assume Suitable data , if necessary***

SECTION - I

Q1) a) State and explain types of nonlinearities, with examples, in case of beams. **[10]**

b) Find the solution for a moment curvature by non linear analysis of a simply supported beam subjected to concentrated load at midspan. **[15]**

Q2) a) Explain 'Displacement Equations Approach' of nonlinear analysis of plates. **[8]**

b) Write the strain energies due to stretching, bending and kinetic energy of an orthotropic plate. Use Hamilton's principle and stress function approach to derive governing equations. **[17]**

Q3) a) Derive the equation for maximum deflection of rectangular plate by nonlinear analysis. **[17]**

b) State a system of four equations governing the large amplitude flexural vibrations of anisotropic plates. **[8]**

P.T.O.

SECTION - II

Q4) a) Obtain the deflection components of cantilever column at post-buckling stage due non linear behaviour. **[20]**

b) Explain Ramberg-Osgood stress strain relationship. **[5]**

Q5) a) Explain Incremental procedure of analysis of material nonlinear problems. **[10]**

b) Explain with diagrams and derivation, the deformation of square pinned-fixed frame for compressive loading. **[15]**

Q6) a) Write steps involved in elastic plastic analysis of frames. **[12]**

b) Obtain stiffness matrix for a member with a hinge by Elastic-Plastic Analysis. **[13]**

☼ ☼ ☼