Total No. of Questions : 7]

SEAT No. :

P5018

[Total No. of Pages : 2

[4960]-1066

M.E. (Mechanical) (Design Engineering)

ADVANCE STRESS ANALYSIS

(2013 Pattern) (Semester - I)

Time : 3 Hours] *[Max. Marks : 50*

Instructions to the candidates:

1) ***Answer any five questions.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Use of logarithmic tables, slide rules and electronic pocket calculator is allowed.***
5) ***Assume suitable data if necessary.***

Q1) a) Derive an equilibrium equation in polar coordinate system. **[6]**

b) Show that $\phi = 2x^2 + 12\ x^2y^2 - 6y^2$ represents an Airy's stress function. Also determine stress distribution. **[4]**

Q2) Derive the governing equation for deflection in circular plate which is simply supported at the edges and subjected to central load 'P'. **[10]**

Q3) Explain in detail the procedure to evaluate elastic properties of composites. **[10]**

Q4) a) Write notes on: **[6]**

i) Energy method for plastic deformation.

ii) Mohr's circle for three dimensional stresses.

b) Explain different criteria for stress analysis of plasticity. **[4]**

P.T.O.

Q5) a) Explain stress measurement by fringe pattern analysis in photoelasticity. **[7]**

b) What is the importance of dimensional analysis? **[3]**

Q6) Derive the expression for contact stresses between two cylinders with their axes at an angle. Write the expressions for maximum principal stress and maximum shear stress and show their variation in the geometry. Use standard notations for all parameters. **[10]**

Q7) Write note on. **[10]**

a) Strain gauge rosettes.

b) Applications of engineering plastics.

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