

Roll No.

24476

B. Tech. 7th Semester (ME)

Examination – December, 2016

STRENGTH OF MATERIAL - II

Paper : ME-401-F

Time : Three Hours]

[Maximum Marks : 100

Before answering the question, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt *five* questions in total. Question number 1 is *compulsory* and attempt *one* question from each Section. All questions carry equal marks.

1. Explain the following : 5 × 4 = 20
- (a) Maxwell's Theorem
 - (b) Ellipse of Inertia
 - (c) Leme's Equation
 - (d) Stresses in Crane Hooks

SECTION - A

2. Derive an expression for strain energy stored in a body when load is applied: 20
 - (i) Gradually
 - (ii) Suddenly
 - (iii) Impact Load
3. Explain various theories of elastic failures with their graphical representations. 20

SECTION - B

4. What do you understand by neutral axis ? Derive the expression for Flexural formula for a curved beam of small radius of curvature subjected to bending. 20
5. Derive an expression for hoop stress and longitudinal stress in thin walled cylinder subjected to internal pressure. 20

SECTION - C

6. On the outer surface of a closed thick cylinder of diameter ratio 2.5 were fixed strain gauges to measure the longitudinal and circumferential strains. At an

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internal pressure of 230 N/mm^2 these strains were recorded as 9.18×10^{-7} and 36.9×10^{-5} respectively. Determine the values of Young's modulus, Modulus of Rigidity and Poission's ratio. 20

7. Derive an expression for maximum value of hoop stress and radial stress in a hollow disc of uniform thickness with a pin hole at the centre and disc rotating at uniform speed. ' ω '. 20

SECTION - D

8. What is the difference in stresses in bars of initial large radius of curvature and bars of initial small radius of curvature ? Explain in detail. 20
9. Derive an expression for principal stresses and deflection in an open coiled helical spring subjected to both axial load and couple. 20

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