DD-317

M. Sc. EXAMINATION, Dec. 2017

(Fourth Semester)

(Re-appear Only)

MATHEMATICS

MAT-616-B

Mechanics of Solids-II

Time : 3 *Hours*]   [*Maximum Marks :* 100

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

Note : Attempt *Five* questions in all, selecting at least *one* question from each Section. All questions carry equal marks.

Section I

1. (a) Derive displacement and stresses in terms of $\phi(z)$ and $\chi(z)$. **12**

   (b) Explain Arry stress function for plane stress problem. **8**

2. Explain thick-walled tube loader external and internal pressure. **20**

Section II

3. (a) Define spring and dashpot. Derive constitutive equation for Maxwell model. **10**

   (b) Explain creep and relaxation phenomenon SLS model. **10**

4. Explain deformation of viscoelastic thick walled tube in plain strain for Kelvin model using correspondence principal of viscoelasticity. **20**

Section III

5. Explain torsion of beam with triangular cross-section of prism. **20**

6. Explain propagation of Rayleigh wave. **20**

Section IV

7. (a) Derive theorem of minimum complementary energy. **10**

   (b) Explain deflection of control line of a beam. **10**

8. Use gelerkin method to find an approximate solution of the problem $\nabla^2 \phi = -2$ in R.

   $\phi = 0$ on the boundary of R where R is a rectangle $|x| \le a$, $|y| \le b$. **20**