

GUJARAT TECHNOLOGICAL UNIVERSITY
ME - SEMESTER-1 (NEW) EXAMINATION – WINTER 2018

Subject Code: 3710909**Date: 07/01/2019****Subject Name: Advance Stress Analysis****Time: 02:30 PM To 05:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full mark.

- Q.1** (a) Derive Compatibility equation in two dimensions. **07**
 (b) Explain in detail Castiglioni's theorem. **07**
- Q.2** (a) Derive general equation of stress in polar co-ordinates. **07**
 (b) Discuss various applications of principle of least work. **07**
- OR**
- (b) Discuss various effects of strain rate on highly deformable materials. **07**
- Q.3** (a) Explain method of computing contact stresses and deflection of bodies in point contact. **07**
 (b) Explain in detail Geometry of contact surfaces. **07**
- OR**
- Q.3** (a) Explain photoelastic theory for experimental stress analysis. **07**
 (b) Explain Airy's stress function. **07**
- Q.4** (a) List out elements of polariscope and explain in detail circular polariscope. **07**
 (b) Derive equation for bending of a circular plate of variable thickness. **07**
- OR**
- Q.4** (a) Derive equation for pure bending of a long uniformly loaded rectangular plate. **07**
 (b) Discuss various stresses to be considered while designing sharp groove of the shaft. **07**
- Q.5** (a) Draw and explain isoclinic and isochromatic fringe patterns. **07**
 (b) Discuss different criterions for three dimensional stress analysis using plasticity. **07**
- OR**
- Q.5** (a) Explain in detail Rayleigh Ritz method. **07**
 (b) Explain in detail Galekin's method. **07**
