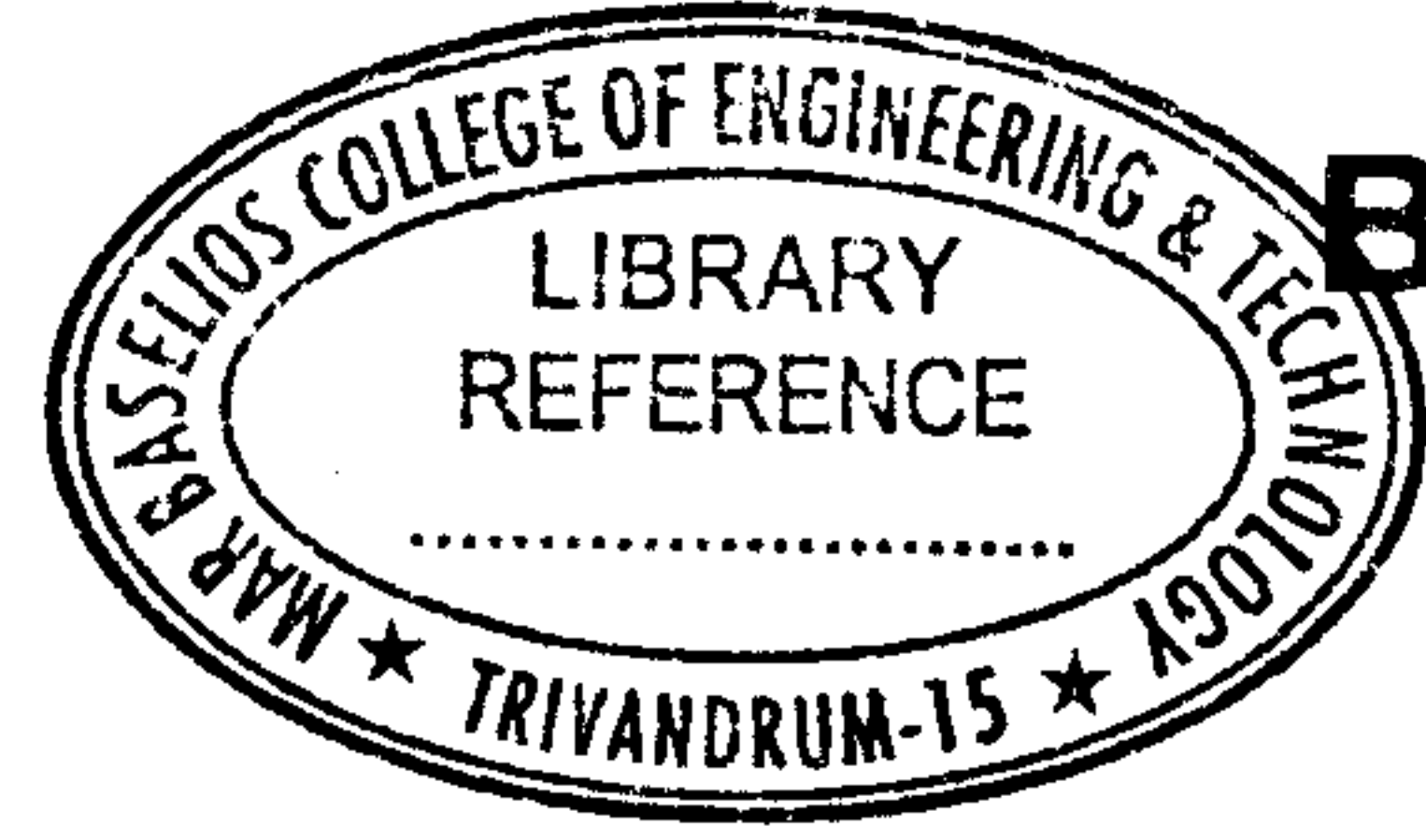




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B - 2885

Reg. No. : .....

Name : .....

**Second Semester M.Tech. Degree Examination, December 2016  
(2013 Scheme)**

**Mechanical Engineering**

**MDE 2007 : EXPERIMENTAL STRESS ANALYSIS**

Time : 3 Hours

Max. Marks : 60

*Instruction : Answer any two questions from each Module.*

**MODULE - I**

1. a) What are the basic principles and techniques employed in the construction of strain gauges ? Explain with examples. 5
- b) What are the basic characteristics of a strain gauge ? Explain. 5
2. a) Describe the construction and working of a mechanical strain gauge. 5
- b) Explain how the electrical resistance strain gauge approaches the requirements of the optimum gauge. 5
3. a) What is temperature compensation ? How it can be achieved ? 5
- b) Explain Gauge Factor and Cross Sensitivity Factor. How cross sensitivity factor is determined ? 5

**MODULE - II**

4. Define stress optic law. Derive the stress optic law in terms of stress as well as strain. 10
5. Explain the functioning of a circular polariscope describing the optical elements involved and their functions. Also, explain with necessary equations how isoclinics are eliminated in circular polariscope. 10
6. What are brittle coatings ? What is the procedure for application of such coatings ? Derive a relation for coating stresses. 10

P.T.O.



MODULE – III

7. What is the necessity to use a three element strain rosette ? Explain how the principal directions are determined by a three element rosette strain gauge. 10
8. What is residual stress ? How are residual stresses beneficial or harmful in different contexts ? Explain any one method of determining residual stress. 10
9. a) Describe the magnetic particle method of NDT with illustrations. 5  
b) Explain the application of lasers in non destructive testing. 5

