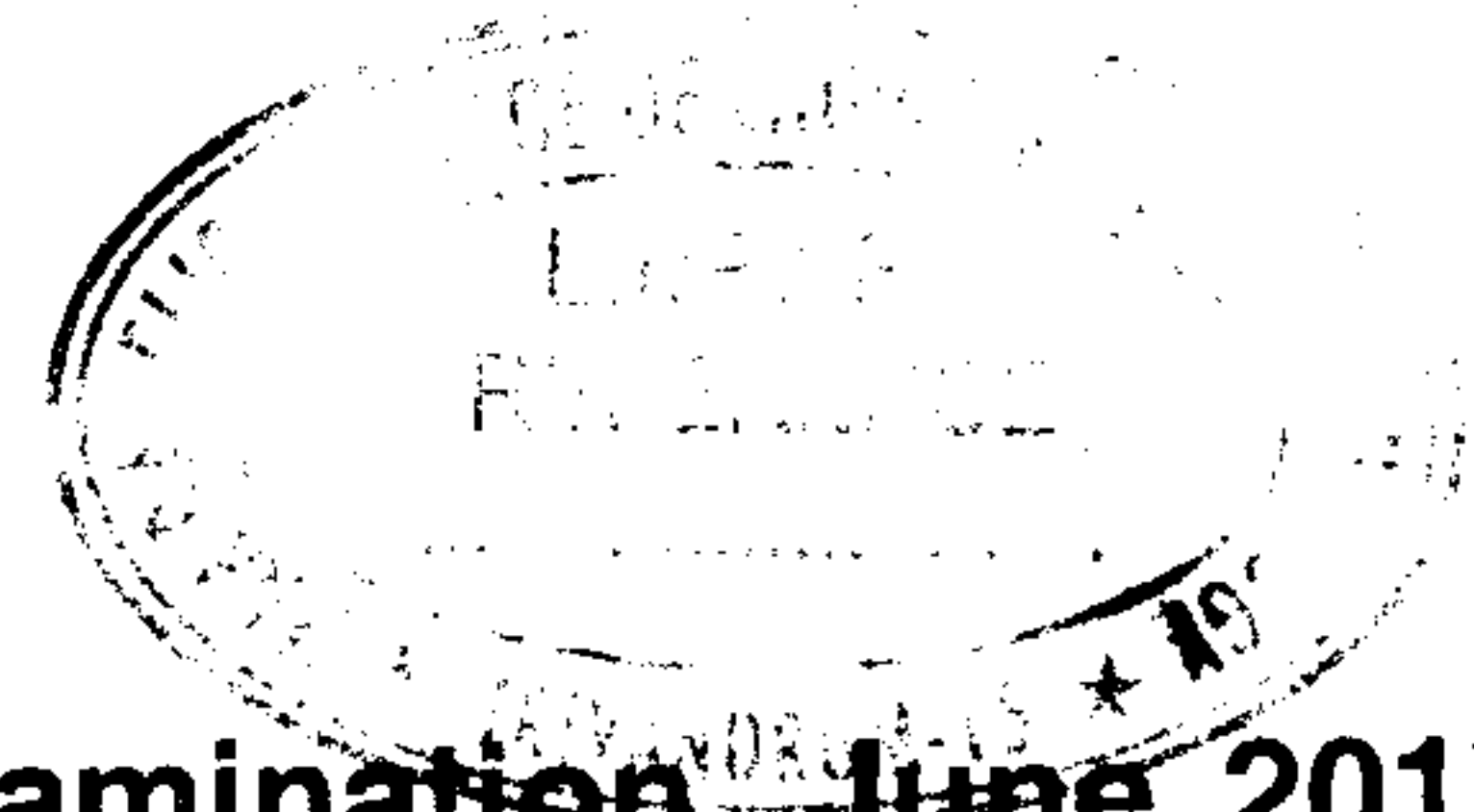




Reg. No. : .....

Name : .....



**Fourth Semester B.Tech. Degree Examination, June 2017**  
**(2008 Scheme)**  
**08.403 : METALLURGY AND MATERIAL SCIENCE (MP)**

Time: 3 Hours

Max. Marks : 100

**PART – A**

Answer **all** questions. **Each** question carries **4** marks.

1. What is the importance of economic consideration on selection of engineering materials ?
2. Write notes on super conductivity and super plasticity.
3. Explain allotropy and polymorphism.
4. What is a Frank-Read source ? What is its importance ?
5. What is solubility limit ? Explain Hume-Rothery's rule.
6. Differentiate hardness and hardenability. How the hardenability of a material can be determined ?
7. Write short notes on CVD and plasma spraying.
8. Define :
  - a) Stiffness
  - b) Strength
  - c) Hardness
  - d) Roughness
9. What is Ductile to brittle transition ? What is its importance ?
10. Write short notes on Nuclear materials and Nano materials. **(10×4=40 Marks)**

P.T.O.



PART – B

Answer **any one** question from **each** Module. **Each** question carries **20** marks.

**Module – 1**

11. Classify engineering materials in accordance with minimum five properties and service requirements.
12. Explain elastic and plastic deformations in metals. What are the factors that affect plastic deformations ?

**Module – 2**

13. What are solidus and liquids curves in phase diagram ? Explain binary eutectic phase diagram with solvent and solute condition completely soluble in liquid state and partially soluble in solid state conditions with suitable examples. Also name the curves and mark important points.
14. Explain and differentiate TTT diagram and CCT diagram of eutectoid steel. Explain the use of TTT diagram.

**Module – 3**

15. What is alloying ? Why it is done ? Give the name of major alloys of aluminium and copper with their alloying elements and the alloy compositions. What are the specific functions of these alloying elements in the alloys ?
  16. a) Differentiate isotropic and anisotropic materials.  
b) what are composites ? Classify them and give suitable examples of each of classification with their field applications. **(3×20=60 Marks)**
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