

## Department of Chemical Engineering.

NATIONAL INSTITUTE OF TECHNOLOGY CALICUT

Reg. No. Practical TCH

Winter Semester 2015

Test I Series Examination

| CH 2004 MATERIAL | SCIENCE |
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Duration: 1 hour Date: 11-02-15 Maximum Marks: [15] Instructions: Briefly answer the following questions. 1. What is Material Science? Briefly explain the classification of materials and its applicability? 2. Describe the classification of bonding types, with examples? (2+1)3. Briefly explain the lattice parameters for seven crystal systems? (1.5)(3) 4. Write a short note on (3X0.5=1.5)(a) Imperfections (b) Anisotropy (c) Dislocations 5. Sketch a tetragonal unit cell, and within that cell indicate locations of the  $[1\ 1\ -1]$  and  $[\frac{1}{2}\ \frac{1}{4}\ \frac{1}{2}]$ point coordinates. (2)

6. (a) Determine the ASTM grain size number of a metal specimen if 45 grains per square inch are measured at a magnification of 100×. And for this same specimen, how many grains per square inch will there be at a magnification of 85×?

(b) Molyhdama decay and a Rose (2)

(b) Molybdenum has a BCC crystal structure, an atomic radius of 0.1363 nm, and an atomic Weight of 95.94 g/mol. Compute its theoretical density and compare it with the experimental value found inside the front cover. (2)