



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

MECHANICAL ENGINEERING

ASSIGNMENT

Course Name	:	METALLURGY AND MATERIAL SCIENCE
Course Code	:	A31803
Class	:	II B. Tech I Semester
Branch	:	ME
Year	:	2016 – 2017
Course Coordinator	:	Dr. K G K Murti, Professor
Course Faculty	:	Dr. K G K Murti, Professor, Dr. N. N. Ramesh, Professor.

OBJECTIVES

Understand metallurgical engineering concepts and properties

Analyze microstructures of metals and alloys and relationship to heat treatment

Compare properties of ceramics, glasses, composites and polymers for industrial applications

S. No	Question	Blooms Taxonomy Level	Course Outcome
ASSIGNMENT-I UNIT-I, II & III			
1	Explain bonds in solids? Discuss examples and applications?	Apply	1
2	Draw seven crystal systems neatly and define coordination number, atomic density, atomic packing factor?	Apply	1
3	Explain directions and planes in unit cell using MILLER INDICES?.	Comprehension, Apply	1
4	Explain solidification in pure metals and alloys? What is ASTM grain size number?	Comprehension, Apply	1
5	Discuss types of solid solutions?	Comprehension, Apply	3
6	Discuss the Hume_Rothery rules for the solid solubility of one element in another?	Comprehension, Apply	3
7	Explain phase rule? Discuss construction of phase diagram?	Synthesis, Comprehension	3,4
8	Explain Cu-Ni binary alloy system?	Synthesis, Comprehension	3,4
9	Draw iron-iron carbide phase diagram and identify various reactions?	Synthesis, Apply	3
10	Explain formation of various types of cast irons? Give typical uses for each?	Synthesis, Apply	3
ASSIGNMENT – II UNIT III, IV & V			
1	Explain with neat sketch the TTT diagram?	Apply	1
2	Discuss annealing, normalizing, hardening? Explain Jominy end quench hardenability test?	Apply	1
3	Explain white CI, Grey CI, Malleable CI, SG CI and their applications?	Analysis, Apply	2,4
4	Explain heat treatable and non-heat treatable aluminium alloys?	Analysis,	2,4

S. No	Question	Blooms Taxonomy Level	Course Outcome
		Apply	
5	Explain different Cu-Zn alloys and their applications?	Apply	2,4
6	Discuss typical properties of various types of titanium alloys?	Apply	2,4
7	Explain Alumina and Zirconia ceramics and their applications?	Apply	2,4
8	Discuss classification of composites? Explain c-c composites and their uses? What are cermets?.	Apply	2,4
9	Explain the properties of leaded glass, Boron silicate glass?	Comprehension, Apply	2,4,5
10	Discuss importance of plastics? What are thermosetting plastics?	Comprehension, Apply	2,4,5

Prepared By:

Dr. K G K Murti, Professor,

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