

B.Tech. Civil (Construction Management)

Term-End Examination

December, 2010

ET-204(A) : MATERIALS SCIENCE

Time : 3 hours

Maximum Marks : 70

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- Note :** (i) *Answer any seven Questions.*
(ii) *All questions carry equal marks.*
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1. (a) What is grain boundary ? What are the advantages of its study ? 5
(b) Write about the materials that are heart of technological advances. 5
2. (a) Distinguish between ionic and covalent bonding in solids giving examples. 5
(b) What are the secondary bonds ? Explain with suitable examples. 5
3. (a) Discuss the various types of crystal structures in metals with appropriate examples. 5
(b) What are Miller indices ? Explain in detail the procedure for the determination of MI's for planes & directions with suitable examples. 5

4. (a) Draw the iron - carbon phase diagram and explain the various regions in it . 5
- (b) What do you mean by one component , two - component systems ? State their differences in regard to the degrees of freedom. 5
5. (a) Explain various types of defects in metals. 5
- (b) Write about screw dislocation with neat sketch. 5
6. (a) Define Stress, Strain and Elasticity. Derive a relation between stress and strain of an elastic body. 5
- (b) Explain with the help of a neat sketch the mechanism of dislocation in plastic deformation. 5
7. (a) What is meant by superconductivity ? Give two examples of superconductors. 5
- (b) Explain about the Meissner effect. 5
8. (a) What is tensile test and what is the significance of " dog - bone shape" ? 5
- (b) Write short notes on **any two** of the following 5
- (a) Ductility.
- (b) Resilience.
- (c) Toughness.

9. (a) Give a definition of casting . What are the basic steps involved in casting ? 5
- (b) Discuss about Machinability of some materials in their decreasing order of Machinability. 5
10. (a) What is corrosion ? Explain in detail. 5
- (b) Explain Electrochemical cell with a neat sketch . 5
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