

Exam.Code:0942  
Sub. Code: 7062

2010

**B.E. (Mechanical Engineering) Sixth Semester  
MEC-605: Materials and Heat Treatment**

**Time allowed: 3 Hours**

**Max. Marks: 50**

*NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit.*

*x-x-x*

I. Answers the following:-

- a) Define coordination number.
- b) What is nucleation?
- c) Name different alloy steels.
- d) Name the different stages of case hardening.
- e) What is tempering? (5x2)

**UNIT – I**

- II. Explain different crystal planes and directions with suitable example. (10)
- III. a) Explain different internal surface imperfections and write their significance.  
b) Write the chemical composition, properties and applications of different tool steel. (5,5)
- IV. a) What is HSLA? Explain different CI with their chemical composition and applications.  
b) What is nucleation? Explain different types of nucleation. (5,5)

**UNIT – II**

- V. a) What is phase diagram? Explain the binary phase diagram.  
b) Explain lever rule? (5,5)
- VI. a) Draw Iron-iron carbide equilibrium diagram and explain different invariant reactions.  
b) What are cooling curves? How does the time-temperature cooling curve of an alloy differ from pure metal? (5,5)
- VII. a) What is hardenability? How will you measure the hardenability using Jominy Test?  
b) What is meant by carburizing? Briefly explain the various types of carburizing. (5,5)

*x-x-x*