

Department of Metallurgical & Materials Engineering
Subject: Introduction to Physical Metallurgy (IPM)

Full Marks $30 \times 1 + 10 \times 2 = 50$

Time: 60 min

Quiz – 2

Subjective Type Questions

1. What is the limitation of phase diagram?
2. Define critical cooling rate (CCR). Which type of microstructure one has to cooling below CCR?
3. Define Bainite? How to get pearlite + Bainite structure in TTT diagram?
4. Which microstructure in eutectoid steel has maximum hardness? Give reason
5. Describe the recovery and recrystallization of annealing mentioning the properties affected by these processes.
6. Nickel, Aluminium & Copper have face centered cubic structure yet Ni is soluble in copper whereas Al has only a limited solubility. Explain why it is so?
7. Two metals A (melting point 800°C) and B (melting point 600°C) form a binary isomorphous system. An alloy having 35% B has 75% solid and rest liquid whereas an alloy having 55%B has 25% solid at 700°C . Estimate the composition of solidus and liquidus at the above temperature
8. Calculate the amount of ferrite and cementite in pearlite and also calculate the amount of austenite and cementite present in ledeburite by using the Lever rule?
9. Derive Gibb's phase rule? What is the minimum and maximum number of phases which could exist in a pure metal?
10. Sketch the microstructure of 0.2% C steel. Calculate % Pearlite % cementite, % proeutectoid ferrite and % total ferrite?

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