Code No: 07A3EC18 | **R07** | **Set No. 2**

II B.Tech I Semester Examinations,MAY 2011
PHYSICAL METALLURGY
Metallurgy And Material Technology

Time: 3 hours   Max Marks: 80
Answer any FIVE Questions
All Questions carry equal marks
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1. Assume that a cold chisel is to be made of plain carbon steel. Analyze the application for properties required, select the hardness range desired, select the carbon content and specify the heat treatment. [16]

2. (a) Explain the Hume-Rothery rules for the formation of solid solutions?

   (b) What is alloying? Why is it required? Explain. [8+8]

3. Draw a binary phase diagram showing the formation of an intermediate phase (γ) by a Peritectoid reaction. Label all the phases, areas, lines and write the various reactions involved in it. [16]

4. Draw and explain the cooling curves for the following:

   (a) Pure metals

   (b) Binary solid solution alloys

   (c) Binary eutectic alloys

   (d) Off-eutectic alloys. [4×4=16]

5. Draw and explain the TTT curve of hyper eutectoid steels. Label all the phases, lines and areas and also discuss significance of each line. [16]

6. (a) A Slowly cooled plain carbon steel has Pro eutectoid cementite to be 10% of its eutectoid cementite. What is the carbon content of the steel?

   (b) A Slowly cooled plain carbon steel shows pro eutectoid cementite to be 10% by weight of the microstructure. What is the carbon % of the steel? [8+8]

7. (a) Find the number of atoms/cm^2 on (100) planes of lead(FCC). Given interatomic distance = 3.499A^0.

   (b) Define linear atomic density and calculate the linear atomic density in atoms per metre in the direction [110] for aluminum (FCC). Given lattice parameter of Aluminum = 4.049A^0. [8+8]

8. (a) Write short notes on macroscopy?

   (b) Define magnifying power and explain the determination of total magnification of objective and eye piece? [6+10]

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R07

Set No. 4

II B.Tech I Semester Examinations,MAY 2011
PHYSICAL METALLURGY
Metallurgy And Material Technology

Time: 3 hours
Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks
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1. (a) Find the number of atoms/cm^2 on (100) planes of lead(FCC). Given inter-atomic distance = $3.499A^0$.

   (b) Define linear atomic density and calculate the linear atomic density in atoms per metre in the direction [110] for aluminum (FCC). Given lattice parameter of Aluminum = $4.049A^0$. [8+8]

2. Assume that a cold chisel is to be made of plain carbon steel. Analyze the application for properties required, select the hardness range desired, select the carbon content and specify the heat treatment. [16]

3. Draw and explain the cooling curves for the following:

   (a) Pure metals

   (b) Binary solid solution alloys

   (c) Binary eutectic alloys

   (d) Off-eutectic alloys. [4×4=16]

4. Draw and explain the TTT curve of hyper eutectoid steels. Label all the phases, lines and areas and also discuss significance of each line. [16]

5. (a) Write short notes on macroscopy?

   (b) Define magnifying power and explain the determination of total magnification of objective and eye piece? [6+10]

6. (a) A Slowly cooled plain carbon steel has Pro eutectoid cementite to be 10% of its eutectoid cementite. What is the carbon content of the steel?

   (b) A Slowly cooled plain carbon steel shows pro eutectoid cementite to be 10% by weight of the microstructure. What is the carbon % of the steel? [8+8]

7. (a) Explain the Hume-Rothery rules for the formation of solid solutions?

   (b) What is alloying? Why is it required? Explain. [8+8]

8. Draw a binary phase diagram showing the formation of an intermediate phase (γ) by a Peritectoid reaction. Label all the phases, areas, lines and write the various reactions involved in it. [16]

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Code No: 07A3EC18　　　　　$\boxed{\textbf{R07}}$　　　　$\boxed{\textbf{Set No. 1}}$

II B.Tech I Semester Examinations,MAY 2011
PHYSICAL METALLURGY
Metallurgy And Material Technology

Time: 3 hours　　　　　　　　　　　　　　　　　　　　　Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks
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1. (a) Find the number of atoms/cm^2 on (100) planes of lead(FCC). Given inter-atomic distance = 3.499A^0.

   (b) Define linear atomic density and calculate the linear atomic density in atoms per metre in the direction [110] for aluminum (FCC). Given lattice parameter of Aluminum = 4.049A^0. 　　　　　　　　　　　　　　　[8+8]

2. Draw a binary phase diagram showing the formation of an intermediate phase (γ) by a Peritectoid reaction. Label all the phases, areas, lines and write the various reactions involved in it. 　　　　　　　　　　　　　　　　　　　[16]

3. (a) Write short notes on macroscopy?

   (b) Define magnifying power and explain the determination of total magnification of objective and eye piece? 　　　　　　　　　　　　　　　　[6+10]

4. (a) A Slowly cooled plain carbon steel has Pro eutectoid cementite to be 10% of its eutectoid cementite. What is the carbon content of the steel?

   (b) A Slowly cooled plain carbon steel shows pro eutectoid cementite to be 10% by weight of the microstructure. What is the carbon % of the steel? 　　[8+8]

5. Draw and explain the TTT curve of hyper eutectoid steels. Label all the phases, lines and areas and also discuss significance of each line. 　　　　　　[16]

6. Assume that a cold chisel is to be made of plain carbon steel. Analyze the application for properties required, select the hardness range desired, select the carbon content and specify the heat treatment. 　　　　　　　　　　　　[16]

7. (a) Explain the Hume-Rothery rules for the formation of solid solutions?

   (b) What is alloying? Why is it required? Explain. 　　　　　　　　　　[8+8]

8. Draw and explain the cooling curves for the following:

   (a) Pure metals

   (b) Binary solid solution alloys

   (c) Binary eutectic alloys

   (d) Off-eutectic alloys. 　　　　　　　　　　　　　　　　　　　[4×4=16]

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Code No: 07A3EC18   **R07**   **Set No. 3**

II B.Tech I Semester Examinations,MAY 2011
PHYSICAL METALLURGY
Metallurgy And Material Technology

Time: 3 hours   Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks
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1. (a) A Slowly cooled plain carbon steel has Pro eutectoid cementite to be 10% of its eutectoid cementite. What is the carbon content of the steel?

   (b) A Slowly cooled plain carbon steel shows pro eutectoid cementite to be 10% by weight of the microstructure. What is the carbon % of the steel? [8+8]

2. Assume that a cold chisel is to be made of plain carbon steel. Analyze the application for properties required, select the hardness range desired, select the carbon content and specify the heat treatment. [16]

3. (a) Explain the Hume-Rothery rules for the formation of solid solutions?

   (b) What is alloying? Why is it required? Explain. [8+8]

4. (a) Find the number of atoms/cm^2 on (100) planes of lead(FCC). Given inter-atomic distance = 3.499A^0.

   (b) Define linear atomic density and calculate the linear atomic density in atoms per metre in the direction [110] for aluminum (FCC). Given lattice parameter of Aluminum = 4.049A^0. [8+8]

5. Draw and explain the TTT curve of hyper eutectoid steels. Label all the phases, lines and areas and also discuss significance of each line. [16]

6. Draw a binary phase diagram showing the formation of an intermediate phase (γ) by a Peritectoid reaction. Label all the phases, areas, lines and write the various reactions involved in it. [16]

7. Draw and explain the cooling curves for the following:

   (a) Pure metals

   (b) Binary solid solution alloys

   (c) Binary eutectic alloys

   (d) Off-eutectic alloys. [4×4=16]

8. (a) Write short notes on macroscopy?

   (b) Define magnifying power and explain the determination of total magnification of objective and eye piece? [6+10]

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