

Code No: 07A3EC18

**R07**

**Set No. 2**

II B.Tech I Semester Examinations, May/June 2012

**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) The ionic radius of an anion is  $2.11\text{\AA}$ . Find the radius of the smallest cation that can have stable eight fold co-ordination with the above anions.  
(b) Calculate the atomic packing factor of BCC structure. [8+8]
2. Describe the following steps with respect to electron microscope:  
(a) Source of illumination  
(b) Condenser lens  
(c) Objective lens  
(d) Projector lens. [4×4=16]
3. (a) Describe the mechanism of dendritic growth in a crystal.  
(b) With a neat sketch explain the cooling curve for a binary solid solution alloy. [8+8]
4. Write short notes on the following:  
(a) Intermediate alloy phases  
(b) Size factor compounds [8+8]
5. Discuss the different methods for obtaining a spheroidized cementite structure. [16]
6. Draw and explain the TTT curve of hypo eutectoid steels. Label all the phases, lines and areas and also discuss significance of each line. [16]
7. Write a short note on the following:  
(a) Solid solution  
(b) Solvus line.  
(c) Recalescence  
(d) Invariant point. [4×4]
8. Discuss and draw the cooling and heating curves of pure Iron. [16]

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**R07**

**Set No. 4**

II B.Tech I Semester Examinations, May/June 2012

**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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  - (b) Condenser lens
  - (c) Objective lens
  - (d) Projector lens. [4×4=16]
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  - (b) Solvus line.
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  - (d) Invariant point. [4×4]
8. Discuss and draw the cooling and heating curves of pure Iron. [16]

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**Set No. 1**

II B.Tech I Semester Examinations, May/June 2012

**PHYSICAL METALLURGY**

Metallurgy And Material Technology

**Time: 3 hours**

**Max Marks: 80**

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  - (c) Recalescence
  - (d) Invariant point. [4×4]
8. Discuss and draw the cooling and heating curves of pure Iron. [16]

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Code No: 07A3EC18

**R07**

**Set No. 3**

II B.Tech I Semester Examinations, May/June 2012

**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. Draw and explain the TTT curve of hypo eutectoid steels. Label all the phases, lines and areas and also discuss significance of each line. [16]
2. Write a short note on the following:
  - (a) Solid solution
  - (b) Solvus line.
  - (c) Recalescence
  - (d) Invariant point. [4×4]
3. Write short notes on the following:
  - (a) Intermediate alloy phases
  - (b) Size factor compounds [8+8]

Describe the following steps with respect to electron microscope:
4. (a) Source of illumination  
(b) Condenser lens  
(c) Objective lens  
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5. (a) Describe the mechanism of dendritic growth in a crystal.  
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6. Discuss and draw the cooling and heating curves of pure Iron. [16]
7. (a) The ionic radius of an anion is  $2.11A^0$ . Find the radius of the smallest cation that can have stable eight fold co-ordination with the above anions.  
(b) Calculate the atomic packing factor of BCC structure. [8+8]
8. Discuss the different methods for obtaining a spheroidized cementite structure. [16]

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