Code No: RR220302 **RR** **Set No. 2**

II B.Tech II Semester Examinations,December 2010
METALLURGY AND MATERIALS SCIENCE
Common to Mechanical Engineering, Mechatronics, Production Engineering, Automobile Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) What do you understand by the term equillibrium diagram? Explain with an example. [8]
   (b) Explain the various applications of phase diagrams. [4]
   (c) What is lever rule? Explain how it is useful. [4]
2. (a) What is generally considered to be the most serious problem associated with the use of CMC's? How is this problem addressed? [8]
   (b) How the rule of mixtures is useful in analyzing the strength of composites. [8]
3. (a) Explain the difference in Microstructure and properties of white and gray cast Iron. [8]
   (b) Assume that a C clamp is to be made up of cast Iron. Select a suitable type of cast Iron and explain the reasons for the selection. [8]
4. Compare and contrast mechanical and hydraulic compacting presses with respect to advantages; disadvantages; applications and working principle. [16]
5. (a) What are the important engineering properties that non-ferrous metals possess, which are not available with ferrous metals? Explain them. [8]
   (b) Discuss the effect of
      i. zinc
      ii. Tin and
      iii. Nickel on the corrosion resistance of copper. [8]
6. Give comparative accounts on the following: [4x4-16]
   (a) Austempering and martempering
   (b) Isothermal and continuous cooling of T-T-T diagrams
   (c) Full annealing and process annealing
   (d) Stages of tempering.
7. (a) There is no end centered tetragonal lattice in the Bravais list, but there is an end centered orthorhombic lattice. Explain why this is so. [7]

(b) Write short notes on the following: [3x3=9]
i) FRENKEL DEFECT
ii) TETRAHEDRAL VOID
iii) OCTAHEDRAL VOID.

8. Giving examples distinguish between substitutional and interstecial solid solutions; interstecial compounds and valence compounds. [16]

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Code No: RR220302 **RR** **Set No. 4**

II B.Tech II Semester Examinations,December 2010
METALLURGY AND MATERIALS SCIENCE
Common to Mechanical Engineering, Mechatronics, Production Engineering, Automobile Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) What are the important engineering properties that non-ferrous metals possess, which are not available with ferrous metals? Explain them. [8]
   (b) Discuss the effect of
      i. zinc
      ii. Tin and
      iii. Nickel on the corrosion resistance of copper. [8]
2. Giving examples distinguish between substitutional and interstecial solid solutions; interstecial compounds and valence compounds. [16]
3. (a) There is no end centered tetragonal lattice in the Bravais list, but there is an end centered orthorhombic lattice. Explain why this is so. [7]
   (b) Write short notes on the following: [3x3=9]
   i) FRENKEL DEFECT
   ii) TETRAHEDRAL VOID
   iii) OCTAHEDRAL VOID.
4. (a) What do you understand by the term equillibrium diagram? Explain with an example. [8]
   (b) Explain the various applications of phase diagrams. [4]
   (c) What is lever rule? Explain how it is useful. [4]
5. (a) Explain the difference in Microstructure and properties of white and gray cast Iron. [8]
   (b) Assume that a C clamp is to be made up of cast Iron. Select a suitable type of cast Iron and explain the reasons for the selection. [8]
6. Compare and contrast mechanical and hydraulic compacting presses with respect to advantages; disadvantages; applications and working principle. [16]
7. Give comparative accounts on the following: [4x4-16]
   (a) Austempering and martempering
   (b) Isothermal and continuous cooling of T-T-T diagrams
   (c) Full annealing and process annealing
   (d) Stages of tempering.

8. (a) What is generally considered to be the most serious problem associated with the use of CMC's? How is this problem addressed? [8]

   (b) How the rule of mixtures is useful in analyzing the strength of composites. [8]

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Code No: RR220302 **RR** **Set No. 1**

II B.Tech II Semester Examinations,December 2010
METALLURGY AND MATERIALS SCIENCE
Common to Mechanical Engineering, Mechatronics, Production Engineering, Automobile Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. Give comparative accounts on the following: [4x4-16]
   (a) Austempering and martempering
   (b) Isothermal and continuous cooling of T-T-T diagrams
   (c) Full annealing and process annealing
   (d) Stages of tempering.
2. (a) What are the important engineering properties that non-ferrous metals possess, which are not available with ferrous metals? Explain them. [8]
   (b) Discuss the effect of
      i. zinc
      ii. Tin and
      iii. Nickel on the corrosion resistance of copper. [8]
3. Compare and contrast mechanical and hydraulic compacting presses with respect to advantages; disadvantages; applications and working principle. [16]
4. (a) What do you understand by the term equillibrium diagram? Explain with an example. [8]
   (b) Explain the various applications of phase diagrams. [4]
   (c) What is lever rule? Explain how it is useful. [4]
5. (a) There is no end centered tetragonal lattice in the Bravais list, but there is an end centered orthorhombic lattice. Explain why this is so. [7]
   (b) Write short notes on the following: [3x3=9]
   i) FRENKEL DEFECT
   ii) TETRAHEDRAL VOID
   iii) OCTAHEDRAL VOID.
6. (a) What is generally considered to be the most serious problem associated with the use of CMC's? How is this problem addressed? [8]
   (b) How the rule of mixtures is useful in analyzing the strength of composites. [8]
7. Giving examples distinguish between substitutional and interstecial solid solutions; interstecial compounds and valence compounds. [16]

8. (a) Explain the difference in Microstructure and properties of white and gray cast Iron. [8]

   (b) Assume that a C clamp is to be made up of cast Iron. Select a suitable type of cast Iron and explain the reasons for the selection. [8]

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Code No: RR220302 **RR** **Set No. 3**

II B.Tech II Semester Examinations,December 2010
METALLURGY AND MATERIALS SCIENCE
Common to Mechanical Engineering, Mechatronics, Production Engineering, Automobile Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Explain the difference in Microstructure and properties of white and gray cast Iron. [8]
   (b) Assume that a C clamp is to be made up of cast Iron. Select a suitable type of cast Iron and explain the reasons for the selection. [8]
2. (a) What do you understand by the term equillibrium diagram? Explain with an example. [8]
   (b) Explain the various applications of phase diagrams. [4]
   (c) What is lever rule? Explain how it is useful. [4]
3. Giving examples distinguish between substitutional and interstecial solid solutions; interstecial compounds and valence compounds. [16]
4. Give comparative accounts on the following: [4x4-16]
   (a) Austempering and martempering
   (b) Isothermal and continuous cooling of T-T-T diagrams
   (c) Full annealing and process annealing
   (d) Stages of tempering.
5. (a) What are the important engineering properties that non-ferrous metals possess, which are not available with ferrous metals? Explain them. [8]
   (b) Discuss the effect of
      i. zinc
      ii. Tin and
      iii. Nickel on the corrosion resistance of copper. [8]
6. (a) There is no end centered tetragonal lattice in the Bravais list, but there is an end centered orthorhombic lattice. Explain why this is so. [7]
   (b) Write short notes on the following: [3x3=9]
   i) FRENKEL DEFECT
   ii) TETRAHEDRAL VOID
   iii) OCTAHEDRAL VOID.
7. Compare and contrast mechanical and hydraulic compacting presses with respect to advantages; disadvantages; applications and working principle. [16]

8. (a) What is generally considered to be the most serious problem associated with the use of CMC's? How is this problem addressed? [8]

   (b) How the rule of mixtures is useful in analyzing the strength of composites. [8]

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