Code No: R05321802 **R05** **Set No. 2**

III B.Tech II Semester Examinations,December 2010
NON-FERROUS EXTRACTIVE 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) What are the major drawbacks of Hall-Heroult cell? Explain.
   (b) Give a flow sheet of Bayer's process and explain the details in the flow sheet. [5+11]
2. With the neat flow sheet explain the leaching process of titanium. [16]
3. With the help of a flow sheet, describe the production of zinc sphelarite mineral. [16]
4. (a) What are the important ores of lead? Give their chemical formulae. Give the names of the places where lead ore deposites are located.
   (b) Name the processes which do desilverisation of lead.
   (c) Distinguish between down draugth sintering machine and updraught machine with reference to lead extraction from sulphide ores. [6+3+7]
5. Explain about:
   (a) Fluidised bed roasting of copper ores.
   (b) Smelting of copper area by is using blast furnace. [8+8]
6. (a) Describe the effect of an increase of pressure on the reaction
   Ni (c) + 4CO (g) = $Ni(CO)_4$ (g)
   Calculate the volume fraction of $Ni(CO)_4$ in a CO, $Ni(CO)_4$ $Ni(CO)_4$ gas mixture that is in equilibrium with pure nickel at a temperature of 180C and a total pressure of 70 atm. Also calculate the temperature at which the same volume fraction of $Ni(CO)_4$ obtained at a total pressure of one atm. Assume that for the aforementioned reaction, ΔH^0 = -35,000 cal and ΔS^0 = 100 cal/degree mole.
   (b) Write down a flow sheet for the Sherrit-Gordon process for nickel hydrometallurgy. Explain the process with proper chemical reactions. [8+8]
7. (a) Explain the significance of decomposition voltage in magnesium electrolysis.
   (b) Discuss the efficiency of Mg electrolysis. [8+8]
8. Explain about the production of reactor grade UO_2 with flow sheet. [16]

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Code No: R05321802 **R05** **Set No. 4**

III B.Tech II Semester Examinations,December 2010
NON-FERROUS EXTRACTIVE 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) Describe the effect of an increase of pressure on the reaction
Ni (c) + 4CO (g) = $Ni(CO)_4$ (g)
Calculate the volume fraction of $Ni(CO)_4$ in a CO, $Ni(CO)_4$ $Ni(CO)_4$ gas mixture that is in equilibrium with pure nickel at a temperature of 180C and a total pressure of 70 atm. Also calculate the temperature at which the same volume fraction of $Ni(CO)_4$ obtained at a total pressure of one atm. Assume that for the aforementioned reaction, ΔH^0 = -35,000 cal and ΔS^0 = 100 cal/degree mole.
   (b) Write down a flow sheet for the Sherrit-Gordon process for nickel hydrometallurgy. Explain the process with proper chemical reactions. [8+8]

2. (a) What are the important ores of lead? Give their chemical formulae. Give the names of the places where lead ore deposites are located.
   (b) Name the processes which do desilverisation of lead.
   (c) Distinguish between down draugth sintering machine and updraught machine with reference to lead extraction from sulphide ores. [6+3+7]

3. With the help of a flow sheet, describe the production of zinc sphelarite mineral. [16]

4. (a) What are the major drawbacks of Hall-Heroult cell? Explain.
   (b) Give a flow sheet of Bayer's process and explain the details in the flow sheet. [5+11]

5. Explain about the production of reactor grade UO_2 with flow sheet. [16]

6. Explain about:
   (a) Fluidised bed roasting of copper ores.
   (b) Smelting of copper area by is using blast furnace. [8+8]

7. (a) Explain the significance of decomposition voltage in magnesium electrolysis.
   (b) Discuss the efficiency of Mg electrolysis. [8+8]

8. With the neat flow sheet explain the leaching process of titanium. [16]

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Code No: R05321802 **R05** **Set No. 1**

III B.Tech II Semester Examinations,December 2010
NON-FERROUS EXTRACTIVE 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. With the neat flow sheet explain the leaching process of titanium. [16]
2. With the help of a flow sheet, describe the production of zinc sphelarite mineral. [16]
3. Explain about:
   (a) Fluidised bed roasting of copper ores.
   (b) Smelting of copper area by is using blast furnace. [8+8]
4. (a) What are the major drawbacks of Hall-Heroult cell? Explain.
   (b) Give a flow sheet of Bayer's process and explain the details in the flow sheet. [5+11]
5. Explain about the production of reactor grade UO_2 with flow sheet. [16]
6. (a) Describe the effect of an increase of pressure on the reaction
   Ni (c) + 4CO (g) = $Ni(CO)_4$ (g)
   Calculate the volume fraction of $Ni(CO)_4$ in a CO, $Ni(CO)_4$ $Ni(CO)_4$ gas mixture that is in equilibrium with pure nickel at a temperature of 180C and a total pressure of 70 atm. Also calculate the temperature at which the same volume fraction of $Ni(CO)_4$ obtained at a total pressure of one atm. Assume that for the aforementioned reaction, ΔH^0 = -35,000 cal and ΔS^0 = 100 cal/degree mole.
   (b) Write down a flow sheet for the Sherrit-Gordon process for nickel hydrometallurgy. Explain the process with proper chemical reactions. [8+8]
7. (a) Explain the significance of decomposition voltage in magnesium electrolysis.
   (b) Discuss the efficiency of Mg electrolysis. [8+8]
8. (a) What are the important ores of lead? Give their chemical formulae. Give the names of the places where lead ore deposites are located.
   (b) Name the processes which do desilverisation of lead.
   (c) Distinguish between down draugth sintering machine and updraught machine with reference to lead extraction from sulphide ores. [6+3+7]

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Code No: R05321802 **R05** **Set No. 3**

III B.Tech II Semester Examinations,December 2010
NON-FERROUS EXTRACTIVE 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. With the help of a flow sheet, describe the production of zinc sphelarite mineral. [16]

2. (a) What are the important ores of lead? Give their chemical formulae. Give the names of the places where lead ore deposites are located.
   (b) Name the processes which do desilverisation of lead.
   (c) Distinguish between down draugth sintering machine and updraught machine with reference to lead extraction from sulphide ores. [6+3+7]

3. (a) Explain the significance of decomposition voltage in magnesium electrolysis.
   (b) Discuss the efficiency of Mg electrolysis. [8+8]

4. (a) Describe the effect of an increase of pressure on the reaction
   Ni (c) + 4CO (g) = $Ni(CO)_4$ (g)
   Calculate the volume fraction of $Ni(CO)_4$ in a CO, $Ni(CO)_4$ $Ni(CO)_4$ gas mixture that is in equilibrium with pure nickel at a temperature of 180C and a total pressure of 70 atm. Also calculate the temperature at which the same volume fraction of $Ni(CO)_4$ obtained at a total pressure of one atm. Assume that for the aforementioned reaction, ΔH^0 = -35,000 cal and ΔS^0 = 100 cal/degree mole.
   (b) Write down a flow sheet for the Sherrit-Gordon process for nickel hydrometallurgy. Explain the process with proper chemical reactions. [8+8]

5. Explain about the production of reactor grade UO_2 with flow sheet. [16]

6. With the neat flow sheet explain the leaching process of titanium. [16]

7. (a) What are the major drawbacks of Hall-Heroult cell? Explain.
   (b) Give a flow sheet of Bayer's process and explain the details in the flow sheet. [5+11]

8. Explain about:
   (a) Fluidised bed roasting of copper ores.
   (b) Smelting of copper area by is using blast furnace. [8+8]

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