Code No: 07A6EC10 **R07** **Set No. 2**

III B.Tech II Semester Examinations,APRIL 2011
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) Explain the differences between general roasting and flash roasting.
   (b) How is sulphur removed in conventional roasting and matte smelting of copper ore?
   (c) Explain the flash smelting techniques in copper extraction process. [5+5+6]
2. Explain the production of titanium by hunter's process .Give the necessary flow chart .Give the advantages & disadvantages of the process ? [16]
3. (a) What is necessary condition that is required to be satisfied for the use of amalgamation process for the extraction of gold. Explain in detail.
   (b) Explain the amalgamation process with the necessary chemical equations. [10+6]
4. What are the ores of uranium .Discuss the important applications of uranium .Explain the magnesia thermic reduction of uranium compound to produce pure uranium metal, with the help of a flow sheet ? [16]
5. Draw a neat sketch of Hall - Heroult cell and describe its operation in detail, giving the complete cell data. [16]
6. (a) Discuss the merits of pressure leaching and bacterial leaching over conventional hydro metallurgical processes.
   (b) Explain in detail the production of anhydrous magnesium chloride from magnetic ores. [8+8]
7. (a) Why is it difficult to work a lead blast furnace with four immiscible liquid phases?
   (b) The lead blast furnaces are rectangular cross section unlike iron blast furnaces. Why?
   (c) Write a short note on desilverization of lead. [5+5+6]
8. With a neat sketch of flow sheet, explain each and every step of hydrometallurgical extraction of zinc. [16]

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Code No: 07A6EC10 **R07** **Set No. 4**

III B.Tech II Semester Examinations,APRIL 2011
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. Distinguish fully between natural carnallite and artificial carnallite, with respect to its composition, properties and eaxtraction process and associated problems. [16]

2. (a) Compare between horizontal retort processing and vertical retort processing of zinc concentrate.
   (b) What is hydrometallurgical extraction of zinc? Explain the steps involved along with a flowsheet. [8+8]

3. (a) Explain flotation process for the recovery of gold from its ores.
   (b) What are the impurities generally associated with gold ores? Explain what is the influence of these impurities on gold ores during extraction process. Discuss fully. [8+8]

4. Write short notes on the following:
   (a) OUTOKUMPU Flash Smelting.
   (b) Tundoo Blast Furnace. [8+8]

5. What is WO_3 ? What is its importance in the production of pure tungsten.Explain the production of WO_3 from ore concentrates. With the help of a flow chart and necessary equations? Discuss the precautions to be followed during this process? [16]

6. (a) Write a detailed note on the mechanical properties of titanium?
   (b) Compare and contrast KROLL'S process of iodide process of titanium extraction ? [6+10]

7. (a) What is anode effect? How it is minimized during the process?
   (b) Explain the advantages and disadvantages of Kashmir aluminum ores. [8+8]

8. Distinguish between the following :
   (a) Matte smelting and Flash smelting of copper
   (b) Electro refining and fire refining of copper. [8+8]

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Code No: 07A6EC10 **R07** **Set No. 1**

III B.Tech II Semester Examinations,APRIL 2011
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) Why does the ALCOA process consume less energy than the Hall - Heroult process?
   (b) Will the injection of methane into the Hall - Heroult cell during aluminum extraction decrease its operating voltage?
   (c) Discuss on anode effect on production of aluminum. [5+5+6]
2. Write short notes on the following:
   (a) Debari process of zinc extraction.
   (b) Treatment of complex sulphide ores for the extraction of zinc. [8+8]
3. Explain the difference between crude magnesium and refined magnesium. Explain the various methods available for converting crude magnesium into a refined magnesium. [16]
4. (a) Explain the reduction process of titanium dioxide with metal calcium and calcium hydride and explain the process.
   (b) Discuss how titanium sponge can be converted into metallic titanium. [8+8]
5. (a) Briefly discuss the physico-chemical principles underlying the chlorination process. Why the chlorination process is performed in the presence of carbon.
   (b) Discuss the important properties and applications of Nickel. Explain about any two nickel alloys. [10 +6]
6. What are the important ores of uranium . Discuss the production of uranium directly from the uranium ores . Also give the flow sheet . Discuss the necessary precautions to be followed during the process ? [16]
7. (a) Explain the blast furnace smelting of lead ore along with a flow sheet.
   (b) Explain about refining of lead. [12+4]
8. Distinguish the following :
   (a) Commercial copper and Blister copper.
   (b) OF-copper and Electrolytic copper.
   (c) Fire refining and electro refining of copper. [4+4+8]

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Code No: 07A6EC10 **R07** **Set No. 3**

III B.Tech II Semester Examinations,APRIL 2011
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 neat sketch and flow chart discuss in detail the preparation of magnesium chloride for electrolysis process. Give all the necessary chemical reactions associated. Also explain the chlorination of magnesium oxide. [16]

2. (a) With a neat flow sheet explain leaching of bauxite at HINDALCO.
   (b) Explain about aluminum plants in India. [8+8]

3. (a) What is Q - S process? Discuss various steps involved in this process.
   (b) What are the important steps in the production of lead from its sulphide ores by pyrometallurgical process? Explain them. [8+8]

4. Give flow sheet for the extraction of gold which includes gravity concentration, amalgamation and cyanidation and explain fully the recovery of gold from its ores. [16]

5. (a) Describe the fission of uranium 235 by a neutron, converting mass to energy.
   (b) Explain the nozzle enrichment process for the uranium ores ? [8+8]

6. (a) Compare and contrast between electrowinning and electrorefining of copper.
   (b) Discuss about copper ores in India. [8+8]

7. (a) What are the important ores of lead? Explain about the treatment of lead ore for the production of metal.
   (b) Explain the following steps in the production of lead.
      i. Treatment of Base bullion.
      ii. Drossing. [6+10]

8. (a) In spite of its good mechanical and corrosion resistance properties, why the use of titanium is only for limited engineering applications? Discuss
   (b) Write short notes on the following titanium minerals.
      i. Ilmenite
      ii. Perovskite [8+8]

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