

**IV B.Tech II Semester Supplementary Examinations, Apr/May 2006**  
**LIGHT METALS & ALLOYS**  
**(Metallurgy & Material Technology)**

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

**Answer any FIVE Questions**  
**All Questions carry equal marks**

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1. (a) List the most common minerals of Aluminum and mention the chief impurities present.  
(b) What is the effect of Silica in extraction of Aluminum? [9+7]
2. (a) Mention the important sources of Beryllium.  
(b) Discuss the extraction of Beryllium by sulphate process. [6+10]
3. (a) What type of alloys are included under the general heading, light alloys?  
(b) What alloying elements are commonly used and what is the effect of alloying elements in the commercial aluminum alloys? [5+11]
4. (a) Draw the Al-Mg equilibrium diagram and label the phases present in it.  
(b) Explain the effects of Magnesium content on the mechanical properties of Al-Mg alloys.  
(c) Why Al-Mg alloys are non-heat treatable? [7+6+3]
5. (a) Explain the physical, mechanical properties of magnesium and its alloys.  
(b) Discuss the advantages and applications of magnesium alloys in engineering industries. [8+8]
6. (a) Discuss the microstructures obtained in Titanium alloys containing  $\beta$ -stabilizing agents after hardening.  
(b) Explain the hardening of  $(\alpha + \beta)$  alloys by quenching from a temperature in the  $\beta$  region. [8+8]
7. (a) Discuss the heat treatment of Aluminum-4.5% Cu alloy.  
(b) What is precipitation hardening? What are the conditions required for precipitation hardening to take place in any alloy? [6+10]
8. Discuss the heat treatment Al-Mg-Si alloys and Al-Zn alloys. [16]

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