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B.E. / B.Tech. (Full Time) DEGREE ARREAR EXAMINATIONS, NOV / DEC, 2012

MATERIALS SCIENCE AND ENGINEERING BRANCH

FOURTH SEMESTER – (REGULATIONS 2008)

ML 9253 – NON FERROUS METALLURGY

Time : 3 hrs Max Mark: 100

Answer ALL Questions

Part – A (10 x 2 = 20 Marks)

1. Copper accommodates only 30% of Zinc. Why?
2. Draw the phase diagram for Cu-Ni system and label the different phases.
3. Why most of the aluminium alloys are non-heat treatable?
4. What are the applications of Aluminum-Lithium alloys?
5. Why magnesium alloys are gaining importance in automotive applications?
6. What are the two crystal structures of Titanium and what is the transformation temperature?
7. What are super alloys?
8. Give the composition and properties of Invar.
9. Why it is difficult to work harden lead at room temperature?
10. How does the addition of lead to brass improve its machinability?

Part – B (5 x 16 = 80 Marks)

11. a. (i) Discuss the phase diagram of copper rich portion of copper –zinc system. (10)

(ii) Write a brief note on properties and applications of metallic copper. (6)

12. a.(i) Write the classification of aluminum alloys and briefly discuss the alloy designation and temper designation. (8)

(ii) Discuss the different steps in the age hardening of aluminum alloys. (8)

(OR)

b. Discuss about the Heat treatable and Non-Heat Treatable Aluminium alloys.

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13. a. Give the composition, properties, applications and limitation of any two magnesium based alloys.

(OR)

b. Discuss about the composition, properties and applications of various Titanium alloys.

14. a. (i) Discuss Nickel based super alloys with reference to alloying elements, strengthening mechanisms, properties and application. (12)

(ii) Write a brief note on Nickel Aluminates (4)

(OR)

b. How are zinc used in corrosion protection of ferrous materials? Explain the properties and uses of zinc alloys.

15. a. Discuss about the composition, properties and applications of Lead and tin alloys.

(OR)

b. Discuss in detail the engineering properties and applications of noble metals and their alloys.

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