B.E. / B.Tech. (Full Time) ARREAR EXAMINATIONS, APRIL/ MAY 2024

MATERIALS SCIENCE AND ENGINEERING BRANCH

(REGULATIONS 2019)

**ML 5702– NON-FERROUS METALLURGY**

Time : 3 hrs

Max Marks: 100

Answer ALL Questions

**Part – A (10 x 2 = 20 Marks)**

1. What is the effect of chromium in stainless steel?
2. What factors determine the wear-resisting properties of steel?
3. Copper is a suitable material for automobile radiators- Why?
4. How does the addition of lead to brass improve its machinability?
5. Why do most aluminum alloys respond to ageing?
6. Compare Aluminum and Magnesium with regard to corrosion resistance.
7. What do you mean by Zone refining? Give example.
8. Write down the differences between fused and aqueous salt electrolysis.
9. How does the addition of lead to brass improve its machinability?
10. Which of the platinum metals has the highest corrosion resistance?

**Part – B (5 x 13 = 65 Marks)**

11. a. Write a brief note on the composition, properties and applications of Cu-Zn alloys, Cu-Sn alloys and Cu-Al alloys.

(OR)

b. Discuss in detail the Cu-Al &Tin Bronze alloys.

12. a. (i) Write the classification of aluminum alloys and briefly discuss the alloy designation and temper designation. (5)

(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.

13. a. (i). Discuss briefly about the designation system of Aluminum alloys. (3)

(ii). Discuss the following aluminium alloys and explain about the specifications designed to them: 2107-T4, 5056-H16, 7075-T6, 6061-0. (10)

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(OR)

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

14. a. What are the common alloying elements with nickel? Discuss them.

(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. What are precious metals? Explain their properties and applications.

**PART – C (1 x 15 = 15 Marks)**

16. (i) What are the primary and secondary sources of uranium? (2)
(ii) Explain the chemistry of alkali leaching of uranium concentrates. (9)
(iii) What are the advantages of alkali leaching over acid leaching?. (4)

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