RAJARATA UNIVERSITY OF SRI LANKA

FACULTY OF APPLIED SCIENCES

B.Sc. (General) Degree

Third Year Semester II Examination – April/May 2016

CHE 3202- METALLURGY AND ALLOYS

Answer **all** questions Time: Two hours

1. a. Discuss the term "Mechanical and Physical Metallurgy" in detail [10 marks]

   b. Out of the different methods of separating and extracting elements, discuss the "High temperature chemical reduction" method in detail. [10 marks]

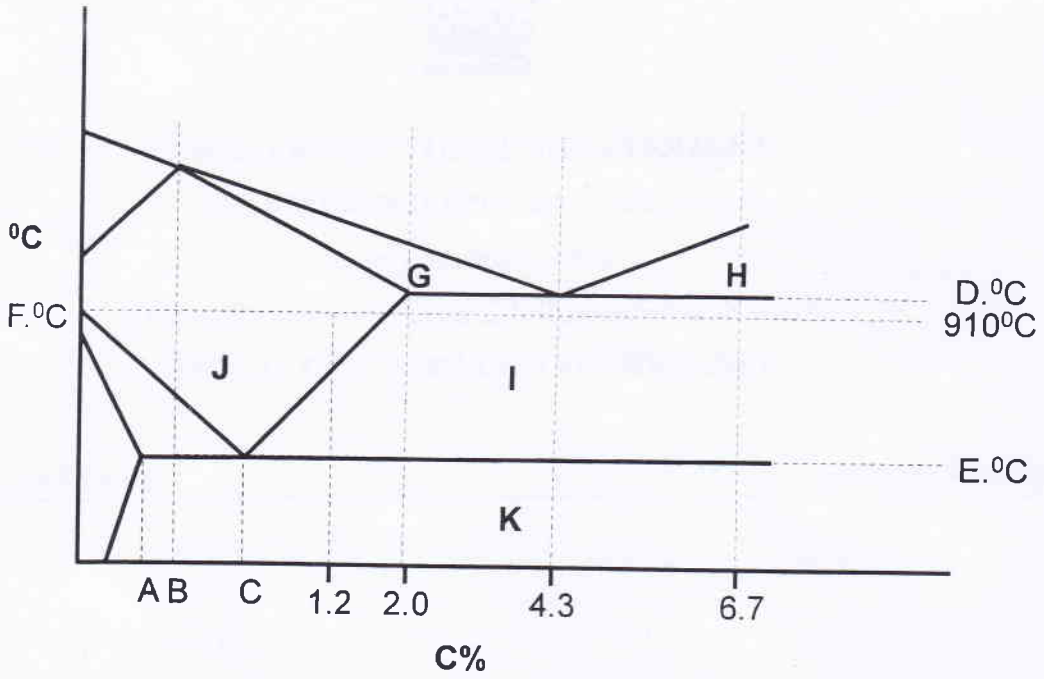
   c. How does the displacement of one element by another takes place. Describe with examples. [05 marks]

2. a. Using a relavant phase diagram describe a two component system [10 marks]

   b. What is the difference between a one component system and a condensed sytem. Elobarate using a phase rules and phase diagrams. [10 marks]

   c. Explain how the Lever Rool can be used for a simple Eutrctic system [05 marks]

3. Given below is the Fe-Fe_2C phase Diagram



a. Label the different regions (G-K) in the diagram with the appropriate terms Austenite, Ferrite, Cementite and Pearlite. What are A, B, C, D, E and F.

[15 marks]

b. Calculate the phases in the cast iron portion of the diagram at the composition with 95.7% ferrite at;

(i) 1650 ^{0}C
(ii) 1131 ^{0}C
(iii) 910 ^{0}C
(iv) 723 ^{0}C

[10 marks]

4. a. Give a brief description of non-ferrous alloys [10 marks]

b. Explain the term Nickel based alloys and give five examples discussing the characteristics, Application and classification of each alloy. [15 marks]