EASTERN UNIVERSITY, SRI LANKA

SPECIAL DEGREE EXAMINATION IN CHEMISTRY

(FEB/MARCH' 2014)

FOURTH YEAR-FIRST SEMESTER-2009/2010

CHS 10-PHYSICAL METHODS

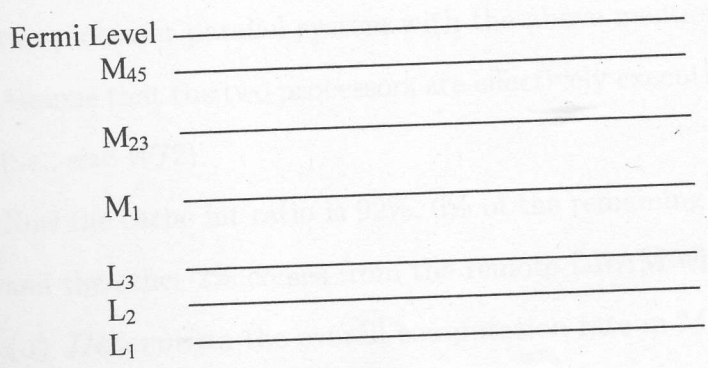
Answer all questions **Time: one hour**

1) (a) Briefly describe the basic principle involved in the Electron Spin Resonance (ESR) Spectroscopy.

(b) Discuss the difference between the Electron Paramagnetic Resonance (EPR) Spectroscopy and Nuclear Magnetic Resonance (NMR) spectroscopy.

(c) (i) Explain the difference between the X-ray Photoelectron Spectroscopy (XPS) and the Auger Electron Spectroscopy (AES) along with kinetic energy calculations for each of the techniques.

(ii) Determine the Auger Electron in the following Titanium Auger process.



(100 Marks)

2) (a) Describe the basic principle involved in the Differential Scanning Calorimetry (DSC) and explain how it differs from Differential Thermal Analysis (DTA).

(b) The decomposition of Calcium Oxalate Monohydrate (CaC_2O_4) was studied using TGA up to the temperature of 900 °C. Three weight losses were observed during the decomposition of CaC_2O_4 in an inert environment (N_2). Sketch the TGA curve you might to get from the decomposition of this compound.

(c) Briefly discuss the principle and the applications of the Mössbauer Spectroscopy.

(100 Marks)
