Uva Wellassa University, Sri Lanka
Faculty of Science and Technology
Science and Technology Degree program
1st Semester Examination – March/April 2013

Uva Wellassa University

SCT 319-2 Instrumental Methods in Biology

Instructions to candidates
Number of questions: Five (05)
Answer Four (04) questions only
Time allocation: Two (02) hours
Total marks allocated: 400

1. Describe
   a. The structure of the antibody molecule with a schematic diagram. (40 marks)
   b. indirect Enzyme-Linked Immunosorbent Assay (indirect ELISA) procedure (50 marks)
   c. the term, 'assay sensitivity' (10 marks)

2.
   a. Make a procedural outline for obtaining different sub-cellular fractions starting from a tissue homogenate (mention equipment and conditions, fraction names and constituents). (60 marks)
   b. Briefly explain the following.
      i. Centrifuge force (give equation)
      ii. RCF (give equation)
      iii. SI derived units
      iv. Preparation of 0.1M K-phosphate buffer (pH, 7.6) (10x4 marks)

3.

a. Describes Beer –Lambert law pertaining to UV-visible spectrometry (give equation). (40 marks)

b. What is the relationship between transmittance (%) and absorbance? (20 marks)

c. How would you determine the molar absorption coefficient of a substance of greater purity when its relative molar mass is known? (40 marks)

4. Polymerase chain reaction (PCR) amplifies DNA.

a. List the ingredients of typical PCR-reaction mixture. (20 marks)

b. Describe the stages and events that take place during thermal cycling (elaborate your key words). (50 marks)

c. How would you estimate the annealing temperature for a particular pair of primers? (30 marks)

5. Comment on each of the following.

a. Nothern blotting

b. Excitation and Emission wavelengths

c. Positive control

d. Chemiluminescence

e. Zeta potential

(20 x 5 marks)