Faculty of Science and Technology
3rd year 1st Semester /2016
Instrumental methods in Biology

PART B

1. a.
   i. Name three causes that result in the broadening of atomic absorption lines.

(1.5 marks)

   ii. Name two background correction methods used in atomic absorption spectrophotometry.

(1 mark)

   b. Briefly discuss the reason to measure absorbance at λ_{max}.

(2.5 marks)

   c. Describe the main steps in the process of amino acid analysis.

(2.5 marks)

   d. Briefly describe how the plasma is generated in an ICP-MS (inductively coupled plasma mass spectrometry) instrument.

(2.5 marks)

   e. Draw a schematic diagram of a photomultiplier tube (PMT).

(2.5 marks)

   f. Describe how the signal amplification is achieved in the PMT.

(2.5 marks)

   g. Describe the process of radioimmunoassay.

(5 marks)

   h. Briefly describe the following terms
   i. Scintillation

(1 mark)

   ii. β^+decay

(1 mark)

   i. Calculate the weight of one curie of ^{32}P in miligrams. The decay constant for ^{32}P is 5×10^{-7} sec^{-1}.

Consider
Avogadro number = 6×10^{23} mol^{-1}
1 curie = 3.7×10^{10} disintegrations per second
Molar mass of ^{32}P is 32 g mol^{-1}

(3 marks)

20 28