The Open University of Sri Lanka

B.Sc. Degree Programme – Level- 04

Open Book Test (OBT) – 2010/2011

Applied Mathematics

AMU 2183/AME 4183-Mathematical Modelling III

Duration: - One and Half Hours.

Date: - 25.09.2010   Time:- 10.00 a.m. – 11.30 a.m.

Answer All Questions.

01.   A super market having a stock clearance promotion for its two products A and B. There
are a total of 70 of there two products. The super market gives away free shampoo
packets and dishwashing liquid packets to customers who buy product A or B.
Unfortunately the stocks are limited. If a customer purchases Product A, he will get one
shampoo packet less and 2 dishwashing liquid packets more than if he had purchased
product B. The difference between the total number of dishwashing liquid packets and
shampoo packets is 20. The number of shampoo packets and dishwashing liquid packets
received by a person who purchases product A is 6. Find out how many of each product
was available in the supermarket and how the free products were distributed.

02.   In an archaeological wooden specimen, only 30% of the original radio carbon-12 was
present. If the radio active decay is proportional to the amount of the radio actie
substance present and the half life period of carbon-12 is 5568 years. Find the age of the
wooden specimen.

03.   (i) Find the dimensions of the rectangle that, for a given perimeter, will have the largest
area.

(ii) A rectangular box open at the top, is to have a volume $32m^3$. What must be the
dimensions so that the total surface area is minimum.