

The Open University of Sri Lanka

B.Sc/B.Ed Degree programme

Applied Mathematics – Level 05

No Book Test (NBT) 2019/2020

ADU 5320- Introduction to MATLAB software



Date: 22.08.2020

Time: 04.00 p.m. – 05.00 p.m.

Answer All Questions.

Clearly specifying the variables, write MATLAB codes for each of the following problems;

1. Write a MATLAB M-file that can be used;

(a) To find the distance  $d$  from a point  $(x_0, y_0)$  to a line  $Ax + By + C = 0$  given by:

$$d = \frac{|Ax_0 + By_0 + C|}{\sqrt{A^2 + B^2}}$$

(b) To calculate the distance of the point  $(2, -3)$  from the line  $3x + 5y - 6 = 0$ .

(b) (a) Write a M-file function (user define function) that converts temperature in degrees °F to temperature in degrees °C.

(Hint: the temperature  $T$  in degrees Celsius (°C) is equal to the temperature  $T$  in degrees Fahrenheit (°F) minus 32, multiplied by the factor  $\frac{5}{9}$ )

(b) Use the function defined in part (a) to solve the following problem.

The change in the length of an object,  $\Delta L$  due to the change in temperature  $\Delta T$  is given by:  $\Delta L = \alpha L \Delta T$ , where  $\alpha$  is the coefficient of thermal expansion.

Determine the change in area of a rectangular aluminum plate with the initial measurement  $4.5\text{m} \times 2.25\text{m}$  associated with change in the temperature from  $40^\circ\text{F}$  to  $92^\circ\text{F}$ .

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