PSG COLLEGE OF TECHNOLOGY
DEPARTMENT OF APPLIED MATHEMATICS AND COMPUTATIONAL SCIENCES
M.Sc (CS), 20XC16 MATHEMATICAL FOUNDATIONS LAB

PROBLEM SHEET – 3

1. Create three row vectors:

$$a = [3\ -1\ 5\ 11\ -4\ 2]\ ,\quad b = [7\ -9\ 2\ 13\ 1\ -2]\ ,\quad c = [-2\ 4\ -7\ 8\ 0\ 9]$$

(*a*) Use the three vectors in a MATLAB command to create a 3×4 matrix such that the first, second, and third rows consist of the last four elements of the vectors *a*, *b*, and *c*, respectively.

(*b*) Use the three vectors in a MATLAB command to create a 3×3 matrix such that the first, second, and third columns consist of the first three elements of the vectors *a*, *b*, and *c*, respectively.

2. By hand (pencil and paper) write what will be displayed if the following commands are executed by MATLAB. Check your answers by executing the commands with MATLAB. (Parts (*b*), (*c*), (*d*), and (*e*) use the vector that was defined in part (*a*).)

(*a*) `a=1:4:17` (*b*) `b=[a(1:3) a]` (*c*) `c=[a;a]'`

(*d*) `d=[a' a']'` (*e*) `e=[[a; a; a; a; a] a']`

3. The following vector is defined in MATLAB:

$$v = [6\ 11\ -4\ 5\ 8\ 1\ -0.2\ -7\ 19\ 5]$$

By hand (pencil and paper) write what will be displayed if the following commands are executed by MATLAB. Check your answers by executing the commands with MATLAB.

(*a*) `a=v(3:8)` (*b*) `b=v([1,3,2:7,4,6])` (*c*) `c=v([9,1,5,4])'`

4. Create the following matrix *A*.

$$A = \begin{bmatrix} 36 & 34 & 32 & 30 & 28 & 26 \\ 24 & 22 & 20 & 18 & 16 & 14 \\ 12 & 10 & 8 & 6 & 4 & 2 \end{bmatrix}$$

By writing one command and using the colon to address range of elements (do not type individual elements explicitly), use the matrix *A* to:

(*a*) Create a six-element row vector named `ha` that contains the elements of the second row of *A*.

(*b*) Create a three-element column vector named `hb` that contains the elements of the sixth column of *A*.

(*c*) Create a five-element row vector named `hc` that contains the first two elements of the third row of *A* and the last three element of the first row of *A*.

5.

Create the following matrix H:

$$H = \begin{bmatrix} 1.25 & 1.5 & 1.75 & 2 & 2.25 & 2.5 & 2.75 \\ 1 & 2 & 3 & 1 & 2 & 3 & 4 \\ 45 & 40 & 35 & 30 & 25 & 20 & 15 \end{bmatrix}$$

(*a*) Create a 2×5 matrix G such that its first row includes the first three elements and the last two elements of the first row of H, and the second row of G includes the last five elements of the third row of H.

(*b*) Create a 4×3 matrix K such that the first, second, third, and fourth rows are the second, third, fifth and seventh columns of matrix H.