Engineering Application Software Final Exam. Class: Name: Student ID:

作答時請注意下列規則, 否則不予計分: (a)圖形請用**複製貼上或另存新檔**,勿用螢幕截圖方式(b)程式與執行結果請**複製文字後貼上**(c ) Octave有些指令之名稱或用法與Matlab不同, 請以**Octave指令**作答

1. Download the file “data.txt” from the Moodle and use textread( ) to load the data set into MATLAB.
2. Use fprintf( ) to create a table of square roots, squares, and cubes. The table will be displayed as shown here:

Number Square Root Square Cube

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1 1.0000 1 1

2 1.4142 4 8

3 1.7321 9 27

4 2.0000 16 64

5 2.2361 25 125

6 2.4495 36 216

7 2.6458 49 343

8 2.8284 64 512

9 3.0000 81 729

10 3.1623 100 1000

1. (a) Use randn( ) to generate an array ‘out\_array’ containing 10,000 random values, (i) open a formatted output text file ‘test.dat’ for writing (‘rt’), (ii) writes the data using fprintf( ) with format ‘%23.15e’, then (iii) close the file.

(b) Show the first five lines in the file ‘test.dat’

(c) (i) Open the formatted file ‘test.dat’ for reading (‘rt’), (ii) read the data back into an array ‘in\_array’ using fscanf( ) with format ‘%f’ , then (iii) close the file.

1. 讀取'flanger.wav' ，將此音訊之振幅調高5倍；取樣率修改成原來的2倍，以subplot分別繪出左右兩聲道之音訊波形。
2. (a)讀取welcome.wav，將此信號取快速傅立葉轉換(fft)並取絕對值後將原點平移至中間以求得其雙邊頻譜。

(b)將上述訊號取震幅調變(Amplitude Modulation, AM), 並繪出此AM信號。

(c) 繪出此AM信號之雙邊頻譜。

(d) 將此AM信號作解調變(Demodulation)，並繪出此解調後之信號。

(e) 繪出此解調後之信號之雙邊頻譜。