



UNIVERSITY OF MINES AND TECHNOLOGY, TARKWA
FIRST SEMESTER EXAMINATIONS, MAY 2018

COURSE NO: EL 276
COURSE NAME: MATLAB-SIMULINK
CLASS: EL II **TIME: 2 HOURS**

Name: _____ Index Number: _____

SECTION B – THEORY (30 MARKS)
Answer section B in your Answer Booklet

Consider the following matrices $A = \begin{pmatrix} 1 & 3 & -8 \\ 7 & 5 & 2 \\ 6 & 4 & 0 \end{pmatrix}$ and $B = \begin{pmatrix} 2 & 9 & -4 \\ 8 & 5 & 6 \\ -2 & 7 & 1 \end{pmatrix}$

MATRIX AND ARRAY CODING

For each question 1-5, write MATLAB code to perform the following activities:

1. Build matrix A: _____
2. Generate a 3x3 identity matrix: _____
3. Create a 4 by 2 matrix of ones: _____
4. Create matrix $D = 2G - 1$, where G is a 3x6 matrix made of B and A written side-by-side.

5. Create array C = even numbers from 4 to 25: _____

EXTRACTION

For each question 6 to 10, write MATLAB code to extract the following:

6. First half of array C: _____
7. The 12th element of matrix G: _____
8. The entire 2nd row of matrix B: _____
9. The 2nd, 4th and 6th elements of row 3 of matrix G: _____
10. The upper triangle of matrix A: _____

MULTIPLE CHOICE

From the list of options lettered a to d, select the most appropriate for the given statement.

11. Typing **diag (A)** gives the output
A. 6 5 -8 B. 1 5 0 C. -8 5 6 D. 7 5 2
12. The code **B(4)** gives... A. 6 B. 7 C. 8 D. 9
13. The code **[m, n] = size(G)** gives the output
A. m=3 n=3 B. m=6 n=3 C. m=3 n=6 D. m=3 n=2
14. The code **A(:,2)** gives the output
A. 3 5 4 B. 7 5 2 C. -8 2 0 D. 6 4 0
15. The code **G(2,5)** gives the output... A. 2 B. 3 C. 4 D. 5
16. The code **D(3)** gives the output
A. 11 B. - 17 C. - 9 D. - 5
17. The code **C(10)*2 - C(8)** gives the output
A. 12 B. 18 C. 26 D. 36
18. The code **C(3)*D(8)*G(18)** gives the output
A. 24 B. 34 C. 67 D. 0
19. The command **fliplr (A)** yields the same results as **transpose(A)**. True / False
20. All these are valid variables in matlab except
A. Tryme2 B. *Try_2me C. Try_2_me D. 2_Try_me

PROGRAMMING / FUNCTIONS (10 Marks)

21. An example of a command written as: **tempconv(52,1)** means temperature 52 converted to Celsius. In like manner, **tempconv(52,0)** means temperature 52 converted to Fahrenheit. Hence, Route 1 is temp to Celsius and Route 0 is temp to Fahrenheit. Please complete the function started below. NB: $^{\circ}F = 1.8 \times temperature + 32$ $^{\circ}C = (temperature - 32)/1.8$. You can give as many comments as possible but only 2 lines of internal help file are required for this function. With the function written, write a code to show how you will apply the function on an array of temperature values (i.e. 16, 25, 37, 80 and 100) to be converted to Fahrenheit.

function [output] = tempconv (temp, route)