



- Important remarks
- The Exam consists of **5 questions on 6 pages plus two white pages.**
 - Answers should be in the specified area **only.**
 - You can use the white page for drafts
 - Read the questions carefully.

Question no. 1 (19 points).

a) (6 pt) Determine whether the following statements are true or false. (In the box write just "√" or "X")

1	The <code>>> clc</code> command erases all variables in the workspace while the <code>>> clear</code> command clears all commands from the command window.	
2	The following is acceptable as a variable name: <code>2x</code> .	
3	In an input prompt: <code>>> x = input('What is your name ?')</code> You Must enter your name as a letters.	
4	For any vector A , $(A * A)$ will give the same results as $(A .* A)$.	
5	Workspace variables cannot be saved and they are deleted completely when ending the MATLAB session and cannot be retrieved.	
6	The symbol <code>%</code> designates a comment which is not executed by MATLAB.	
7	The "for" loop is used when the looping process must terminate when a specified condition is satisfied and thus the number of passes is not known in advance.	
8	The semicolon <code>(.)</code> suppresses output when used with MATLAB commands and <code>(;)</code> terminates the MATLAB line.	
9	The Transpose command (<code>trans</code>) interchanges the rows and columns of a matrix and (<code>inv</code>) produces the inverse of the matrix.	
10	The <code>disp</code> command displays string during program execution while <code>echo</code> command displays array or string.	
11	The <code>>> eye(2,5)</code> produces an identity matrix with 2 rows and 5 columns.	
12	The <code>>> repmat(3,3,3)</code> produces a square matrix with 3 rows and 3 columns and all elements value is 3.	



b) (7 pt) For $a = 2, b = 3, c = 4$ and $d = 5$ Determine which of the following statements will correctly execute and provide the result. If the command will not correctly execute, state why it will not.

Statement	Correct or incorrect	Result: if it is correct or Why if it is incorrect
$X1=2*b*\sin(c*d)*\cos(a*b)$		
$X2=a*b*\tan(c*d)*\exp(ab)$		
$X3=\log(a*b)*\ln(a*b)*\text{sqrt}(2*a)$		
$X4=2*c*d*\tanh(a)*\text{acos}(b)*b*\sin(a)$		
$X5=a*b*s*d*(\text{sqrt}(c*d+a+b))$		
$X6=a*d*c*\text{asin}(1/b)*\text{acos}(1/b)*d$		
$X7=a^2*b^3*d^4*C^5$		

c) (6 pt) For the vector $X=[5\ 1\ 3\ 2\ 6\ 8\ 9\ 7]$. Find the value of the following Logical Expression.

Logical Expression	Value
$X1=X(X \leq 9)$	
$X2=X([2:\text{end}-2])$	
$X3=X(X \sim= 8)$	
$X4=[X(1:4)\ X(\text{end}-2:\text{end})]$	
$X5=[X(2:-1:1)\ X(\text{end}-1:\text{end})]$	
$X6=X(X \leq 3)$	

C

Question no. 2 (12 points).

- a) (7 pt) (Let $x = [1 \ 4 \ 8]$, $y = [2 \ 1 \ 5]$, $A = [3 \ 1 \ 6; 5 \ 2 \ 7]$ and $B = [3; 6; 4]$. Determine which of the following statements will correctly execute and provide the result. If the command will not correctly execute, state why it will not.).

Statement	Correct or incorrect	Result: if it is correct or Why if it is incorrect
$x + y$		
$x + y'$		
$x * y$		
$x \cdot y'$		
$x * B$		
$A * B$		
$y * B$		

- b) (5 pt) Write a MATLAB code to plot the function $T = 6\ln(t) - 7e^{0.2t}$ over the interval $1 \leq t \leq 5$. Put a title on the plot and properly label the axis where T represents the temperature, °C and t represents time, min.

Question no. 3 (10 points).

- a) (5 pt) Write a script file using conditional statements to evaluate the following assuming scalar x has a value;

$$y = \begin{cases} x^2 & x < -1 \\ 2 & -1 \leq x \leq 1 \\ x + 5 & 1 < x \end{cases}$$

- b) (5 pt) Write a MATLAB code to create a square matrix ($N \times N$). The matrix has diagonal elements equal N^3 and all the other elements equal N^2 . The input to the code is the number of element N and the output is the matrix in the matrix form.

2

Question no. 4 (10 points).

a) (5 pt) Use a MATLAB code to solve the following set of equations:-

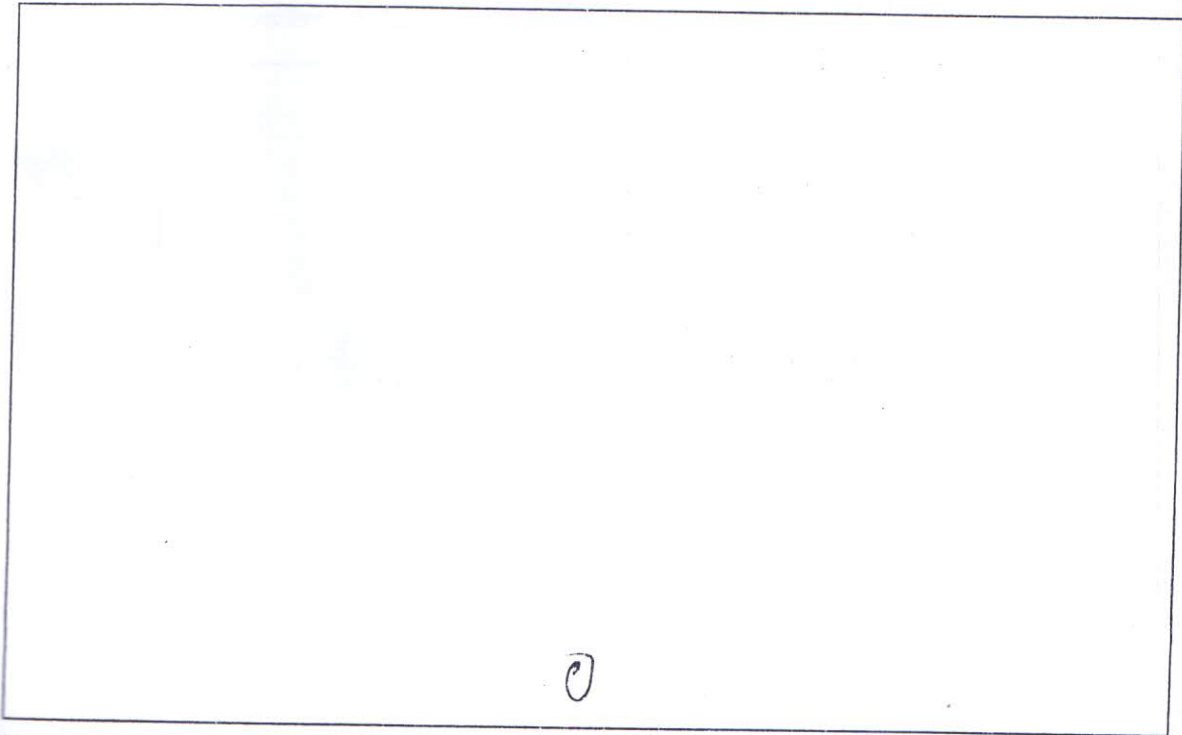
$$3x + 2y - z = 1$$

$$2x - 2y + 4z = -2$$

$$-x + 0.5y - z = 0$$



b) (5 pt) Write a MATLAB code to find the factorial of any number (N). The input to the program is the number N and the output is the factorial of the number (do not use the factorial commands).

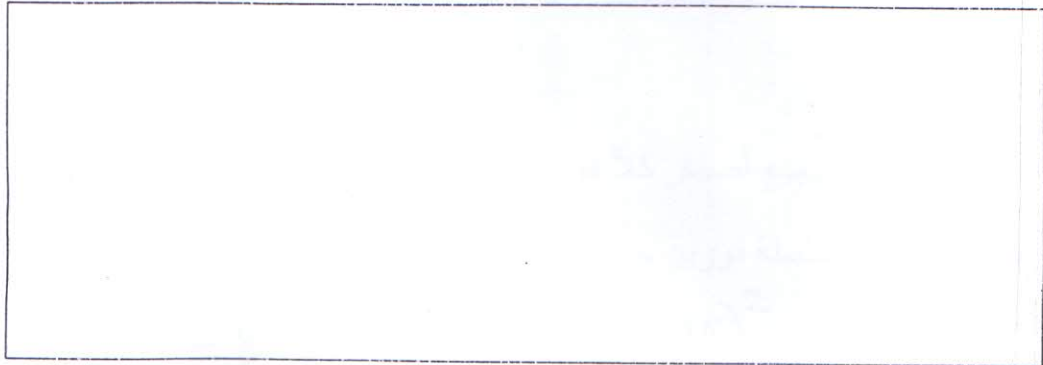


0

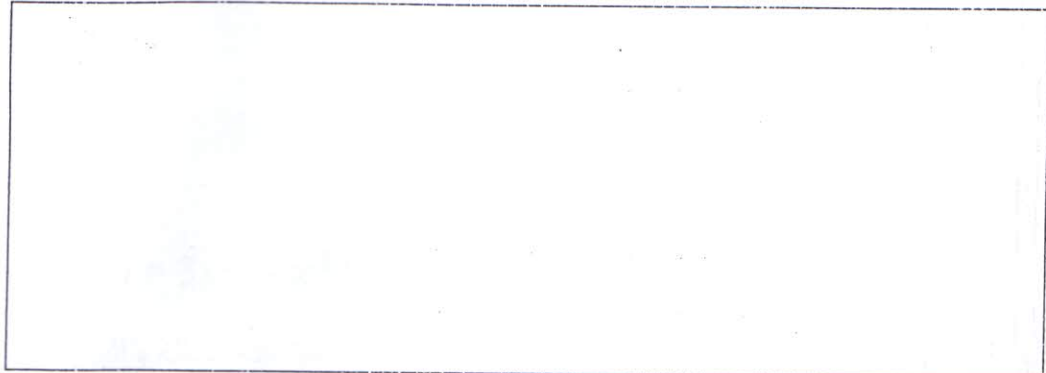
Question no. 5 (9 points).

For the following two polynomials $F_1 = 2x^4 - 5x^2 + 12x - 73$ and $F_2 = x^2 + 3x - 9$
Write a MATLAB commands to;

- i. Find the roots of F_1 and F_2 .



- ii. $F_3 = F_1 * F_2$



- iii. The derivative of F_3 .

