



University of Technology  
Department of Applied Sciences  
Examination of First Semester  
2016 -2015



Subject : Programing (Matlab)

Branch :Appl-Math

Examiner: A.M Shukur

Class : third class

Time : 3 hours

Date : /9/2016

Note: Answer only five questions, ( 10 marks for each question )

Q1) IF  $A = \begin{Bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{Bmatrix}$  and  $B = \begin{Bmatrix} 1 & 3 \\ 6 & -1 \\ 4 & 2 & 2 \end{Bmatrix}$ ; then write only one command on C.W to find the following: a) Change all values in matrix A equal 2? b) Change all values in matrix A equal square values? c) change A to one column? d) find matrix C ; where  $c_{ij} = a_{ij} b_{ij}$  ? e) Find  $X = 2.^A$  ?

Q2) Write m-file which is used to calculate:  $\int_a^b f(x) dx$  and  $\frac{d^n}{dx^n} f(x)$  ? for any values Of a,b,n and f(x), the user must define f(x) in C.W before running this file, give your m-file this name " Myfirstfile" ?

Q3) write a m-file to fit points  $X = \{x_1, x_2, \dots, x_n\}$  and  $Y = \{y_1, y_2, \dots, y_n\}$ , by using two methods: first "power-polynomial ( $P_2(x)$ )" ; second "spline interpolate ( $P_s(x)$ )" the user can enter (X , Y and n) by using keyboard, then he will get the both polynomials " $P_2(x)$  and ( $P_s(x)$ )", at C.W, also the figures of "(X,Y),  $P_2(x)$  and ( $P_s(x)$ )", at the same figure?

Q4) write a M-file to calculate area and circumference of circle, If the user runs this program, he will read these messages "pleas enter value of radius "; and " R = " , also if the user entered a negative value. he will read " please enter positive value" and " R= " , then the program returned : the area and circumference of this circle?

Q5) write the matlab-commands that equivalent to the following math-expressions:

a)  $\int_a^b \sin(x^2) (\cos(x))^2 dx$ ; b) find  $f''(x)$ ; where  $f(x) = e^{2x} \sin(x)$ .

c) find  $f(a)$ ; where  $f(x) = e^{2x} \sin(bx)$ .

d) Solve  $(\frac{d^3}{dx^3} u = u)$ , where  $u''(0) = \pi$ ;  $u'(0) = -1$ ;  $u(0) = 1$  ?

e) find the values of a; u and v? where  $(u^2 - v^2 = a^2$ ;  $u + v = 1$ ;  $a^2 - 2a = 3)$ ?

Q6) write a M-file to calculate ( $N!$  ; where  $N \in \mathbb{N}$ ); if the user entered a negative number, the program should print an error message and ask the user to enter positive number again?