

حسابات علمية

إمتحان العملى

كلية الحاسبات والمعلومات

الزمن ٤٥ دقيقة

ديسمبر ٢٠١٣

الفرقة الثالثة

E اسم الطالب:

Answer the following three questions:

(Total Marks 20)

1) Write down the necessary MATLAB commands to perform the following:

a) **(2 marks)** Evaluate $\sin(30)\sinh(34)\log_3(33) / (8e^5 \times 2^5)$.

b) Given $\mathbf{A} = \begin{pmatrix} 1 & 6 & 3 \\ 1 & 2 & 5 \end{pmatrix}$ and $\mathbf{B} = \begin{pmatrix} 7 & 4 \\ 5 & 6 \\ 7 & 9 \end{pmatrix}$, compute the following:

i. **(1 mark)** $\mathbf{AA}^t, \mathbf{AB}, \mathbf{A} + \mathbf{B}^t$.

ii. **(1 mark)** $\tanh(5\mathbf{A}), \tan \mathbf{A}^t + \ln|\mathbf{B}|$.

c) **(2 marks)** Compute the derivative $\frac{dy}{dx}$ of the following

function $f(x) = \sin(x)e^{4x} \ln(x^3)$.

2) Perform the following using the Bisection Method:

a) **(3 marks)** Write a MATLAB program for approximating the solution of the algebraic equation $2x^3 - x^2 + 5 = 0$ for $-2 \leq x \leq -1$ to within 10^{-5} .

b) **(2 marks)** Compute the exact solution using MATLAB.

c) **(2 marks)** Compute the actual error.

3) Perform the following using Euler's method:

a) **(3 marks)** Write a MATLAB program for approximating the

solution to $\frac{dy}{dx} = x + y$ at $x = 0.2$ such that $y(0) = 1$.

b) **(2 marks)** Compute the exact solution using MATLAB.

c) **(2 marks)** Compute the actual error.

Best Wishes