CSU33081 Sample Exam Paper 2020

**Instructions**

* There are 10 Multiple Choice Questions. Answer **ALL** questions.
* This is a ‘Books-Open’ exam. Use of the text(s) and notes is permitted.
* Use of non-programmable calculators is permitted.
* You may not use MATLAB or similar software for this examination.
* You must upload your typeset solutions along with the filled out Multiple Choice Questionnaire and the declaration that this is your own work to Blackboard.
* To fill out the questionnaire place the letter (A, B, C or D) denoting the correct answer after ‘Answer’ at the end of the question.
* **ALL** documents submitted should be as .pdfs
* You will only receive marks for a question if your answer is accompanied with a bona-fide solution as above.

Q1.

What is the displayed result when the following MATLAB script file is executed?

x=[6:8;-1:1;567];

y=x(:,3);

size(y’)

Choose your answer from the following:

1. 1 1
2. 3 1
3. 1 3
4. 3 3

Answer: C

Q2.

Consider the following MATLAB program:

X=(5<7)&((1>4) | (8~=0))

What is the value of X?

Choose your answer from the following:

1. 0
2. False
3. True
4. 1

Answer:

Q3.

How would we represent the summation of the following two polynomials in MATLAB?

and

Choose your answer from the following:

1. [-6 2 2]+[-4 2 1]
2. [2 2 -6]+[1 2 4]
3. [0 2 2 -6]+[1 0 2 -4]
4. [2 2 -6 0]+[1 2 4 0]

Answer:

Q4.

Calculate the Truncation Error, at , in approximating the function   
For the approximation use the Taylor Series polynomial approximation of degree two, , expanded about the point

Choose your answer from the following:

1. -7.171875
2. -7.645227
3. -4.358405
4. -7.994173

Answer:

Q5.

Use Newton’s Method to find a root of the equation

accurate to within an error of , where is the value of at the iteration. Use a starting point of

Choose your answer from the following:

1. 1.134778
2. 0.616384
3. 1.505056
4. 1.160489

Answer:

Q6.

Find the lower triangular matrix [L] in the [L][U] decomposition of the matrix given here:

Choose your answer from the following:

Answer:

Q.7

Using , as an initial guess at the solution, determine the values of , and that result from three iterations of the Gauss-Seidel method applied to this matrix equation:

=

Choose your answer from the following:

1. ,
2. ,
3. ,
4. ,

Answer:

Q8.

There is a functional relationship between the density of air and altitude above sea-level.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| h (km) | 0.32 | 0.64 | 1.28 | 1.60 |
| (kg/) | 1.15 | 1.10 | 1.05 | 0.95 |

The functional relationship has the form . is found to be . Also, the density of air at the top of the atmosphere is the density of air at sea-level.

The altitude in kilometres to the top of the atmosphere is best approximated by:

Choose your answer from the following:

1. 46.2
2. 46.6
3. 49.7
4. 52.5

Answer:

Q9.

For the function and the points

, evaluate the quadratic Newton’s interpolating polynomial at

Choose your answer from the following:

1. -0.063133
2. -0.036335
3. -0.098334
4. -0.017882

Answer:

Q10.

The value of using a two-segment (interval) Simpson’s 1/3 rule is best approximated by:

Choose your answer from the following:

1. -7.8063
2. 7.8423
3. 8.4433
4. 10.246

Answer: