American International University-Bangladesh

Department of Mathematics

**Math 5**: Numerical Methods For Science & Engineering (Section: **F**)

**Assignment (mid)**

Spring 20-21

Total Marks: 10



**a**. Solve the above [system](javascript:def('/Glossary/glossaryterm.aspx?word=System',%20500,%20500);) by using Gaussian elimination with partial pivoting.

**b**. Justify your result by direct substitution in the original equation.

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| --- | --- | --- |
| 1. Given the linear system: | | |
| 1. Reduce the above system to diagonally dominant form. | | |
| 1. Write the corresponding Gauss- Seidel iteration formula. | | |
| 1. Compute **one** iteration to estimate the nearer solutions to 2 d.p. with | | |
|  | Given the equation |
| i. | Find only the number of real roots by using graphical method. |
|  |  |
| ii. | Use the Secant method **once** to find the root correct to 2 d.p. in the interval  [1.1, 1.7]. |
|  |  |
|  | Given the equation |
| i. | Use the Bisection method **twice** in the interval [1, 1.4] to get a new smaller interval. |
| ii. | Use the Newton-Raphson iterative formula **two** times to find the root considering any initial value in the latest interval acquired in (i) |
| iii. | Write the MATLAB command “**fzero(fun, x0)**” to find the root in the interval [1, 1.4]. |
|  |  |

Instructions:

* Assignment must be neat and clean.
* First write down the question and then corresponding answer properly.
* At the top of every page you must write your name, ID and page number.
* Incomplete assignment will not be accepted.
* Make a single pdf of the assignment and submit it through teams in assignment section.
* Last date of submission: 11 March-2021 Thursday (11 AM).
* Marks will be deducted for late submission.