BRAC University (Department of Computer Science and Engineering)

CSE 330 (Numerical Methods)
SET A

Quiz 04

Student ID: **Full Marks: 15**

Section:

Name: **Duration: 20 minutes**

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1. State the disadvantages/limitations of Newton's method.
   [2 marks]
2. Consider the following **fixed point function**, g(x) = $(4x - 1)^3$. [4 marks]
   a) If g(x) leads to linear convergence, what is the range of x_*
   b) Starting from x_0=3.5, find the value of x_* after **2 iterations** up to 3 significant figures.
3. Consider the following **fixed point function**, g(x) =$\sqrt{2x - 3}$. [4 marks]
   For x_* = -1, 3 find if g(x) is a converging function or diverging function.
   {Hints: Find convergence rate, λ }
4. **{Show 2 iterations (k=0,1,2)}** Use Newton's method to find root of f(x) = x^3+2x-4 by using starting point x_0=3. [5 marks]

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SET B

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1. State the disadvantages/limitations of Newton's method.
   [2 marks]
2. Consider the following **fixed point function**, g(x) = $(4x - 1)^3$. [4 marks]
   a) If g(x) leads to super linear convergence, what is the range of x_*
   b) Starting from x_0=2.5, find the value of x_* after **2 iterations** up to 3 significant figures.
3. Consider the following **fixed point function**, g(x) = $\sqrt{4x - 3}$. [4 marks]
   For x_* = 1, 2 find if g(x) is a converging function or diverging function.
   {Hints: Find convergence rate, λ }
4. **{Show 2 iterations (k=0,1,2)}** Use Newton's method to find root of f(x) = x^3+2x-4 by using starting point x_0=2. [5 marks]