ES84 Prelim Exam
1st Sem, S.Y. 2014-2015

Name: _____   Date: _____
Course & Year: _____   Lab Section: _____

Part I. Given the function $f(x) = 2cos(\sqrt{x}) - x$ where x is in radians:

(a) Use the **Bisection Method** with initial guesses $x_l = 1.00$ and $x_u = 1.50$ to complete Table 1 with the correct values (calculated up to 7 decimal places, round up) until the estimated error ε_a is less than the stopping criterion $\varepsilon_s = 2\%$.

iter	x_l	x_u	x_r	ε_a
1	1.0000000	1.5000000		
2				
3				
4				
5				

(b) Use the **False Position Method** with the same initial guesses $x_l = 1.00$ and $x_u = 1.50$ to complete Table 2 with the correct values (calculated up to 7 decimal places, round up) until the estimated error ε_a is less than the stopping criterion $\varepsilon_s = 2\%$.

iter	x_l	x_u	x_r	ε_a
1	1.0000000	1.5000000		
2				

(c) Using the **Fixed-Point Iteration Method** (five iterations, $x_0 = 1.065$). Fill out Table 3:

Iter	x_i	ε_a
0	1.0650000	
1		
2		
3		
4		
5		

Part II. Determine the lowest positive root of: $f(x) = \ln(x^2) - 0.7$

(d) Using the **Newton-Raphson Method** (three iterations, $x_0 = 1.0$). Fill out Table 4:

iter	x_i	ε_a
0	1.0000000	
1		
2		
3		

(e) Using the **Secant Method** (five iterations, $x_{-1} = 0.5$ and $x_0 = 3.5$). Fill out Table 5:

Iter	x_{i-1}	x_i	ε_a
0	0.5000000	3.5000000	
1			
2			
3			
4			
5			