Nepal College of Information Technology

**Unit Test**

Fall 2013

Program : BE\_SE Time : 2 hrs

Semester : (VII) FM : 70

Subject : Engineering Mathematics-I PM : 35

* *Candidates are requested to give their answer as far as practicable in their own words.*
* *The figure in the margin indicates the full marks*
* ***Attempt ALL question***

1. a) If a function f (x) is derivable at a point x = c. Show that f(x) is continuous at x = c. By taking suitable example show that the converse may not be true. (7)

b) State Leibnitz theorem for successive derivative of the product of two functions. If y = tan-1x, show that (8)

i) (1 + x2)y1 = 1

ii) (1 + x2)yn+1 + 2nxyn + n(n-1)yn-1 = 0

2. a) State and prove Lagrange’s mean value theorem. Use it to show that if f'(x) > 0 in [a, b] function f(x) is increasing in [a, b]. (8)

b) State L. Hospital’s theorem. Evaluate  (7)

3. a) Evaluate the improper integral . (8)

b) (7)

4. a) Reduction formula for (8)

b) Define gamma function and prove that: (7)

5. Evaluate ( any two) (2\*5=10)

a) 

b) 

c) 