

## Principle of Programming Language (RCS-503)

### ASSIGNMENT 5

1. With the help of axioms and rules for beta equality, prove that  $SII =_{\beta} \lambda z.zz$  Where  $S = \lambda xyz.(xz)(yz)$  and  $I = \lambda x.x$  [CO5]
2. With the help of axioms and rules for beta equality, prove that  $SIII =_{\beta} I$  Where  $S = \lambda xyz.(xz)(yz)$  and  $I = \lambda x.x$  [CO5]
3. twice (twice)  $f x =_{\beta} f(f(f(x)))$ , Where twice is  $\lambda fx.f(fx)$ . [CO5]
4. Evaluate this  $(\lambda x. (\lambda x. (+ (* x 1)) x 2) 5)$  [CO5]
5. Differentiate between functional programming and logic programming. [CO5,CO6]
6. Explain the use of queries in ML. [CO4]
7. What is unification in prolog? [CO1,CO6]
8. Consider the following PROLOG database of cities and respective states [CO6]  
Location (Banglore, Karnataka).  
Location (Mumbai, Maharashtra).  
Location (Pune, Maharashtra).  
Location (Surat, Gujrat).  
Location (Hyderabad, AP)  
Answer the following queries
  - i) Specify the goal to find the cities of various states.
  - ii) Specify the goal to find the state in which pune is located.
9. Justify the statement- Goal order changes the solutions. [CO1,CO6]