

# Indian Statistical Institute, Delhi Centre

## Branching Processes

Fall 2009

### Assignment # 6

Date Given: October 19, 2009  
Date Due: October 26, 2009

Total Points: 20

1. Let  $\mathcal{A}$  be the set of probabilities on  $\mathbb{N}$  with finite second moment. Let  $\mathcal{P}$  be the set of all probabilities on  $[0, \infty)$ . Consider the transformation  $\mathcal{W} : \mathcal{A} \rightarrow \mathcal{P}$  where for  $\mu \in \mathcal{A}$ ,

$\mathcal{W}(\mu) :=$  distribution of the limiting  $W$  of a GWBP with progeny distribution  $\mu$  and  $Z_0 \equiv 1$ .

- (a) Is the function  $\mathcal{W}$  onto? [5]  
(b) Is the function  $\mathcal{W}$  one-to-one? [15]

[Answer the questions with reasons supporting your claims.]