

**152.** An insurance company issues a special 3-year insurance to a high risk individual ( $x$ ). You are given the following multi-state model:

- (i) State 1: active  
State 2: disabled  
State 3: withdrawn  
State 4: dead

Annual transition probabilities for  $k=0, 1, 2$ :

$i$	$P_{x+k}^{i1}$	$P_{x+k}^{i2}$	$P_{x+k}^{i3}$	$P_{x+k}^{i4}$
1	0.4	0.2	0.3	0.1
2	0.2	0.5	0.0	0.3
3	0.0	0.0	1.0	0.0
4	0.0	0.0	0.0	1.0

- (ii) The death benefit is 1000, payable at the end of the year of death.
- (iii)  $i = 0.05$
- (iv) The insured is disabled (in State 2) at the beginning of year 2.

Calculate the expected present value of the prospective death benefits at the beginning of year 2.

- (A) 440
- (B) 528
- (C) 634
- (D) 712
- (E) 803