



**Uva Wellassa University**  
**Faculty of Management**



Degree of Bachelor of Business Management in Entrepreneurship and Management  
3rd YEAR 2nd SEMESTER EXAMINATION - SEPTEMBER-OCTOBER 2012

**EMG 334-2 Actuarial Mathematics- I**

**Part C- Essay Questions**

Select two questions from the three questions.

1. For a group of individuals all age  $x$ , of which 45% are diabetic patients(D) and 55% are non-diabetic patients(ND)

You are given.

- a.  $\delta = 0.1$
- b.  $\bar{A}_x^D = 0.388$
- c.  $\bar{A}_x^{ND} = 0.189$
- d.  $T$  is the future life time of  $(x)$
- e.  $\text{Var}[\bar{a}_T^D] = 5.507$
- f.  $\text{Var}[\bar{a}_T^{ND}] = 5.307$

Calculate  $\text{Var}[\bar{a}_T]$  for an individual chosen from this group.

(25 marks)

2. For a group of 250 individuals age  $x$ , you are given.

- a. The future life times are independent.
- b. Each individuals should pay 500 at the beginning of each year (If living)
- c.  $A_x = 0.369137$
- d.  ${}^2A_x = 0.1774113$
- e.  $i = 0.06$

Using the normal approximation, calculate the size of fund needed at inception in order to be 90% certain of having enough money to pay the life annuity.

(25 marks)

3. Consider the fully discrete 10 year endowment insurance.  
You are given,

- a. Current life age is 25.
- b. Death benefit is 100000
- c. Mortality follows Illustrative Life Table.
- d.  $i = 0.06$

Calculate the premium of this endowment insurance.

(25 marks)

(Total-50 marks)