Cm1 april 2019

Q13

First we need to calculate premiums of the respective polcies

Premium of endowment assurance policy:

Premium(P )\* adue35:<25> = 200000 \* A35:<25>

P = (200000\*0.383589)/16.026681

P(A)= 4786.880078

SINGLE PREMIUM FOR ANNUITY:

P(B) = 10000\*adue65

P(B) = 10000\*13.665631

P(B) = 136656.31

NOW, RESERVE AT END OF 2018

17V35 PRO = 200000\*A52:<8> - 4786.880078\* adue52:<8>

17V35 PRO = 200000\*0.734238 – 4786.880076\*6.909802

17V35 PRO = 113771.2065

NOW, RESERVE AT END OF 2018 FOR ANNUITY:

17V65 PRO = 10000\* adue82

17V65 PRO = 10000\*6.801277

17V65 PRO = 68012.77

TOTAL DEATH STRAIN FOR ENDOWMENT ASSURANCE

= 200000 - 113771.2065

= 86228.7935

TOTAL DEATH STRAIN FOR ANNUITY:

= 0 – 68012.77

= -68012.77

NOW MORTALITY PROFIT = EXPECTED DEATH STRAIN – ACTAUL DEATH STRAIN

EXPECTED DEATH STRAIN FOR ENDOWMENT ASSURANCE = q51 \* 15203\*86228.7935

=0.002809 \* 15203 \*86228.7932

= 3682420.188

ACTUAL DEATH STRAIN FOR ENDOWMENT ASSURANCE = 46\*86228.7932

=3966524.487

MORTALITY PROFIT = 3682420.188-3966524.487

= -284104.299

SIMILARLY FOR ANNUITITES PART:

EDS = q81 \* (-68012.77 )

= 12352\*0.059952\*(-68012.77)

= -50365299.6

ADS = 746\*(-68012.77)

= -50737526.42

MORTALITY PROFIT = -50365299.6 – (-50737526.42)

=372226.82

(2)

WE GET ENDOWMENT ASSURANCE POLICY MORTALITY PROFIT TO BE NEGATIVE SINCE EXPECTES DEATH WAS LOWER THAN ACTUAL DEATH

EXPECTED DEATHS WERE 0.002809 \* 15203=42.7 AND ACTUAL WAS 46 .

SAME GOES FOR ANNUITY POLICY

EXPECTED DEATH WAS LOWER AS COMPARED TO ACTUAL DEATH

EXPECTED DEATHS WERE 12352\*0.059952 = 740.5

AND ACTUAL WAS 746

BUT SINCE HERE RESERVES ARE NEGATIVE

WE GET MORTALITY PROFIT TO BE POSITIVE

Q12:

LOAN AMOUNT = 80000

TERM = 10 YEARS

WE NEED TO FIND MONTHLY INSTALLMENTS PAYABLE IN ARREARS:

12\*INSTALLMENTS(P) \* a(12)<10> = 80000

* INSTALLMENTS(P) = 80000/(12\*6.9527)
* INSTALLMENTS(P) = 958.8601071

(2)

LOAN AOUTSTANDING AT 1 NOV 2018

TILL 1 NOV 2018, 34 INSTALLEMENTS HAVE BEEN PAID

REMAINING INSTALLMENTS = 86

PV OF REMAINING INSTALLEMNTS = 958.8601071 (1 – (1+0.006432)^-86)/0.006432

=63185.5132