

PGDM (Insurance Business) 2014-16
Elements of Actuarial Science (Life & Non Life)

INS-406

Trimester – IV, End-Term Examination, September, 2015

Time allowed: 2½ Hours

Max Marks: 50

Roll No: _____

Instruction: Students are required to write Roll No on every page of the question paper, writing anything except the Roll No will be treated as **Unfair Means**. In case of rough work please use answer sheet.

Note : - *Please be relevant and brief in your answers.*

- *Section C is compulsory.*

- *Do not write anything on this question paper except your roll no.*

Section-A

There are 5 questions in this section. Attempt any 3 questions. Each question carries 5 marks.

- A-1. Calculate the time in days for £ 3,600 to accumulate to £4,000 at:
- (a) A simple rate of interest of 6% per annum [1]
 - (b) A compound rate of interest of 6% per annum convertible quarterly [2]
 - (c) A compound rate of interest of 6% per annum convertible monthly [2]
- [Total 5]
- A-2. An investor pays £400 every half-year in advance into a 25-year savings plan. Calculate the accumulated fund at the end of the term if the interest rate is 6% per Annum convertible monthly for the first 15 years and 6% per annum convertible half-yearly for the final 10 years. [5]
- A-3. Find the present value at the rate of 6% of 4 annual payments of Rs. 200/- p.a. followed by 7 annual payments of Rs. 350/- p.a., the first payment being made at the end of 1st year. [5]
- A-4. Find the annual premium for a policy which will pay a lump sum of Rs. 10,00,000 at the end of 15 years. Premium is payable annually in advance. Ignore mortality and effective p.a. interest rate is 10% p.a. [5]
- A-5. A small shop has a "pick-n-mix" counter where customers may choose wine gums, jelly beans or cola bottles. The probability that a customer purchases cola bottles is 0.45, jelly beans and wine gums 0.19, cola bottles and jelly beans 0.15, cola bottles and wine gums 0.25, cola bottles or jelly beans 0.6, cola bottles or wine gums 0.84, and at least one of them 0.9.
- Calculate the probability that a customer purchases:
- (i) Jelly beans [1]
 - (ii) Wine gums [1]
 - (iii) All three [2]
 - (iv) None of them [1]
- [Total 5]

Section-B

[Note: Answer 2 out of the 3 Questions below. Each Question carries 10 marks.

[2x10=20]

B-1.

Describe briefly, suitable life insurance products that might be purchased by the following customers, explaining how they meet the needs of the customer, and whether they would normally be conventional without profits, with profits or unit-linked.

(i) A recently married young couple, who plan to start a large family. [5]

(ii) A financial services company that employs 2,000 people. [5]

Total [10]

B-2.

The following table shows incremental claims relating to the accident years 1997, 1998 and 1999. It is assumed that claims are fully run-off by the end of Development Year 2.

Estimate total outstanding claims using the chain-ladder technique, ignoring inflation.

Incremental claims		Development Year		
		0	1	2
Accident Year	1997	2,587	1,091	251
	1998	2,053	1,298	
	1999	3,190		

Total [10]

B-3.

An individual, whose motor insurance policy is due for renewal, uses a website to compare quotes from a range of providers including his current insurer.

The individual supplies personal and other details and specifies the type of cover required. Based on this information, the website gives a wide range of premiums, all of which are lower than the premium currently being paid.

Explain possible reasons for the range and size of the results of this comparison exercise. Total [10]

Section-C

Case Study

15 Marks

A large insurance company, which has been selling various personal lines products for many years, is now considering selling travel insurance.

- (i) Outline the advantages and disadvantages of:
 - (a) Selling the product directly [1.5]
 - (b) Using travel agents to sell the product [1.5]

 - (ii) Outline the items of data that the insurance company would need in order to price this new travel insurance product. [6]
- The insurance company has invited an airline to act as a distribution channel for this product.
- (ii) Discuss the impact, on the insurance company's business model, of selling travel insurance through the airline. [6]
- Total [15]