EXAMINATION

16 September 2008 (pm)

Subject CA3 — Communications

Time allowed: Three hours

INSTRUCTIONS TO THE CANDIDATE

1.   Enter all the candidate and examination details as requested on the front of your answer booklet.

2.   You have 15 minutes at the start of the examination in which to read the questions. You are strongly encouraged to use this time for reading only, but notes may be made. You then have three hours to complete the paper.

3.   You must not start writing your answers in the booklet until instructed to do so by the supervisor.

4.   Attempt Question 1 AND Question 2.

AT THE END OF THE EXAMINATION

Hand in BOTH your answer booklet, with any additional sheets firmly attached, and this question paper.

In addition to this paper you should have available the 2002 edition of the Formulae and Tables and your own electronic calculator from the approved list.

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1   You are an actuarial student working in a pensions administration department. Your company has received the following letter from a member of one of the pension schemes that you administer.

Dear Mr Hughes

I understand from a company announcement that my ex-employer, XYZ, has recently gone into liquidation.

I am currently receiving a pension from the XYZ Pension Scheme of £600 per week, on which I receive guaranteed pension increases of 3% per annum. I know that the Company had joined the Government Pension Security Fund. Can you confirm that this change in my ex-company's fortunes will have no impact on my pension, as my wife and I are worried?

Yours sincerely,

Mr F Landers

A new student working in your team has drafted the following reply, having done some background reading.

Dear Mr Landers

The Government Pension Security Fund was established to pay compensation to members of eligible pension schemes, when there is a qualifying insolvency event in relation to the employer and where there are insufficient assets in the pension scheme to cover Government Pension Security Fund levels of compensation. The XYZ Pension Scheme is covered by the Government Pension Security Fund. You are lucky as not all pension schemes are in the GPSF.

The GPSF is funded by a tax on the investment income received by Pension Schemes. This has increased the costs of companies providing pensions for their employees and may have been a contributing factor in your ex-employer getting into financial difficulties.

You are already receiving a pension from your scheme as you retired early ie you are an early retirement pension member. I have had a look at the calculations and found that your pension will be reduced under the GPSF so that you only get 95% instead of 100%. There is also a maximum of £27,368.42 p.a. that applies for your age. If your scheme had a lower normal retirement age or you had been in ill health when you retired then you would have been entitled to 100% of your pension, but unfortunately this will not apply in your case.

Full details of any information you need can be found on the Government Pension Security Fund website www.GovPension.org which has details that are relevant to all the parties involved in pensions, Trustees, Actuaries as well as other advisers. There is also another website GPSFonline.org that you may find interesting that has details of how your compensation is calculated. GPSFonline is aimed more at members of schemes and the GovPension site is aimed more at the professionals involved.

I hope this has helped to clear up your concerns.

Yours truly,

The student has also provided the following additional information regarding the compensation payments:

- Mr Landers is age 60.

- The XYZ Pension Scheme Normal Retirement Age (NRA) is 65.

- The XYZ Pension Scheme provides a 50% spouse's pension on death.

- Mr Landers will receive compensation payments from the GPSF instead of payments from the XYZ Pension Scheme.

- The Annual Compensation Cap for the GPSF at age 60 is £27,368.42.

- The Annual Compensation Cap for the GPSF at age 65 is £28,000.

- The Annual Compensation Cap applies only once at the age that the member starts to receive compensation from the GPSF.

- If below Scheme NRA, the amount payable from the GPSF is:
    - 95% of Minimum of {Annual pension from the scheme, Annual Compensation Cap}.

- If at, or above Scheme NRA, the amount payable from the GPSF is:
    - 100% of Annual pension from the scheme.

- A 50% spouse's pension is payable under the GPSF.

- Pension increases under the GPSF are in line with increases in prices, subject to a maximum of 2% each year.

Redraft the letter to Mr Landers in approximately 500 words. Your letter should cover the change in Mr Landers' benefits including an explanation of the change in pension increases. You should also provide other relevant information. You can assume that all the factual information provided by the student is correct. You are only expected to need to do minimal further calculations.

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2   You work for a large insurance company which provides a range of policies including annuities. A new manager has just been appointed to your team from the finance department. He has asked if you can provide him with a brief description of the annuities that your company provides, and if there is any impact from the fact that people are living longer.

To assist you in your response, one of your junior students has drafted some briefing notes as follows:

Annuities – briefing notes

- Frequency of annuity payments are usually monthly, but could be quarterly or annual.
- Usually bought by individuals and pension schemes to be payable for life – i.e. they cease on death.
- Can build in reversionary annuity – called a joint life annuity – payable to nominated individual upon death of main annuitant. It's usually 50% but could be something different.
- Annuities can escalate in payment.
- Escalation can be a fixed % or linked to the Retail Prices Index at individual's choice.
- Escalation reduces the start annuity but then it grows faster as time goes by and overtakes a level annuity.
- Individual selects the various options at outset.
- Main factors affecting cost of an annuity are age, sex, interest rates, mortality assumption, amount of escalation and provision for a dependant.
- Purchase price generally non-refundable but can build in guarantees.
- Choice of interest rate determined by reference to basket of high-quality securities of appropriate duration – e.g. Government Bonds.
- We are currently using an interest rate of 5% p.a.
- Future improvements in mortality need to be taken into account as it's important not to understate mortality.
- Annuities now pay out less for a given sum. Lower interest rates have also added to this.
- Historical annuity rates much higher due to higher interest rates and lower mortality assumption in the past.
- We have been analysing our own office's mortality experience using various statistical graduation techniques.
- We are allowing for mortality to improve at about 1 year in every 15. That is, if an annuity rate to a current 55 year old has a value of x, a current 40 year old buying an annuity in 15 years' time would expect the mortality allowance to increase the annuity rate to about $x + 1$.

Annuities – briefing notes (contd)

- Sample male annuity rates at age 55 (age 65 in brackets):

Type of annuity	3% interest rate	5% interest rate	9% interest rate
a_x	20.11 (15.61)	15.66 (12.85)	10.55 (9.31)
$a_{\overline{x:5}}$	20.13 (15.69)	15.68 (12.93)	10.56 (9.39)
$a_{\overline{x:5}} + \frac{1}{2}a_{x/x-3}$	21.82 (17.80)	16.63 (14.31)	10.90 (10.04)
$a_{\overline{x:5}} + \frac{1}{2}a_{x/x-3}$, 3% increases	36.35 (26.35)	25.73 (20.24)	15.06 (13.19)

- Life expectancy for current 55 year-old: 31.86 years (21.99 for current 65 year-old).

- Projected life expectancy at age 55 for current 40 year-old: 32.75 years (22.88 years at age 65 for current 50 year-old).

- Sample female annuity rates at age 55 (age 65 in brackets):

Type of annuity	3% interest rate	5% interest rate	9% interest rate
a_x	21.17 (17.01)	16.23 (13.76)	10.74 (9.74)
$a_{\overline{x:5}}$	21.19 (17.08)	16.25 (13.82)	10.75 (9.79)
$a_{\overline{x:5}} + \frac{1}{2}a_{x/x+3}$	21.85 (17.83)	16.66 (14.36)	10.93 (10.09)
$a_{\overline{x:5}} + \frac{1}{2}a_{x/x+3}$, 3% increases	36.24 (26.27)	25.74 (20.26)	15.09 (13.25)

- Life expectancy for current 55 year-old: 34.76 years (24.89 for current 65 year-old).

- Projected life expectancy at age 55 for current 40 year-old: 35.59 years (25.70 years at age 65 for current 50 year-old).

- Historical annuity bought with a lump sum of £100,000 (male age 60 with 50% contingent dependant's annuity; increasing in line with inflation).

Year	1990	1995	2000	2005
Interest rate	9%	7%	6%	5%
Annuity	£8,000 p.a.	£6,000 p.a.	£4,750 p.a.	£3,500 p.a.

Draft a memo to the new manager in around 500 words briefly explaining, with examples:

(1)   what an annuity is and the different annuity options that your company provides to policyholders.

(2)   how the amount of an annuity varies according to which options policyholders choose.

(3)   how annuity rates are likely to be affected by future improvements in mortality.

(4)   the decline in historic annuity rates.

In giving examples, you should illustrate your response assuming a policyholder has a fund of £100,000 to purchase an annuity.

You should:

(a)   assume any numbers stated above are correct.

(b)   ignore any issues relating to reserving, legislation, tax and financial advice.

(c)   ignore any special annuities not covered above, e.g. impaired life annuities, unit-linked annuities or with-profit annuities.

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END OF PAPER