EXAMINATIONS

27 April 2004 (pm)

Subject 201— Communications

Time allowed: 1½ 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 1½ 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 EITHER question 1 OR question 2 but NOT BOTH questions.

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 Actuarial Tables and your own electronic calculator.*

1   You work for a firm of consulting actuaries who advise a defined benefit pension scheme. The scheme administrator has asked you to reply to the following letter sent by a member who stopped working for the employer some years ago.

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14 Hillview
Anytown

1 April 2004

The Administrator
Smith & Brown Pension Scheme

Dear Sir,

Member number B61 — D K Ross

You recently sent me details of the pension I could receive next month at my 60th birthday, and also if I wait 5 years before I start it. These showed that I could have a pension of £5,000 a year now, or £6,500 plus inflation in 5 years' time. I am still working, so I have no need to start the pension now unless it is better for me financially.

I read recently that a 60 year old man in this country can expect to live to 78. I think that by then my pension will have paid me £90,000 if I take it now, or £84,500 plus inflation if I wait for 5 years.

It looks as though I would be better starting my pension now, unless "plus inflation" gives me quite a lot more. Could you please explain exactly how my pension grows if I delay it and show how the delayed pension compares with the pension I could get now.

Yours faithfully,

Daniel Ross

You have investigated the circumstances, and found out the following information:

Those who delay retirement receive an increase to their pension of 6% a year (simple interest). In addition, both pensions in payment and delayed pensions are increased each year in line with the Index of National Average Prices (INAP), a standard measure of price inflation produced by the government. The delayed pension is

$$\text{Original Pension} \times (1 + 0.06d) \times \frac{\text{INAP}_2}{\text{INAP}_1}$$

where d is the number of years for which the pension is delayed, INAP_2 is the level of the index at the actual retirement date and INAP_1 is the level at the normal retirement date.

Based on past experience, your company uses a specially constructed mortality table for the scheme. From this table, the life expectancy of a 60 year old male scheme member is 21 years.

The following table shows the probabilities of survival to various ages and the total amount of pension paid to those ages assuming nil inflation.

Age	Probability of survival	Total pension paid	
		Immediate pension	*Pension delayed to age 65 (0% inflation)*
65	91%	£25,000	£0
80	55%	£100,000	£97,500
90	18%	£150,000	£162,500

Using relevant information from your investigation, draft a reply to Mr Ross, addressing the points he has raised, in about 500 words.

Notes

1. You should not consider other options, such as transferring benefits out of the pension scheme.

2. You can assume that the facts provided by Mr Ross are correct, and that average life expectancy of scheme members is higher than for the population as a whole.

3. There are no death benefits.

4. You should assume that there are no regulatory or other restrictions on what you can say to Mr Ross. You should only outline the issues and not give advice.

5. You are not expected to carry out detailed calculations.

2   Your friend, who works as a cashier in a bank, has invested some money in a unitised fund and has recently received a statement from the investment manager. She has told you that she does not understand how the investment works or some of the information provided. In particular, she does not understand the two different rates of return.

She has given you a copy of the statement which contains the following details:

Your account was set up on 1 April 2011 with an initial investment of £10,000. Details of your initial investment and subsequent payments are shown in the table below.

The assets of the fund are invested in a wide range of assets, such as UK equities, overseas equities, and bonds. We have discretion to choose which types of asset to invest in and which securities to pick within each type. This is in accordance with the product details supplied at the outset.

The performance of your investment over the last 2 years has been as follows:

- the money weighted rate of return has been −23.2% per annum
- the time-weighted rate of return has been −25.0% per annum

The reason for the poor return on the fund has primarily been the fall in equity markets over the last year. The promising start to 2012 was overwhelmed by the dismal performance of markets in the second and third quarters of the year. Threats of war, decline in profit expectations and corporate scandals all conspired to undermine the global recovery. Equities confounded experts by falling for a third successive year in 2012.

Table 1 below summarises the Fund values at the end of each quarter and also shows any regular transactions.

Date	Fund Value Before Investment / Withdrawal	Investment	Withdrawal	Fund Value After Investment / Withdrawal
01/04/2011	Nil	10,000		10,000.00
30/06/2011	9,937.21			9,937.21
30/09/2011	8,005.12	500		8,505.12
31/12/2011	10,203.35		750	9,453.35
31/03/2012	8,633.89			8,633.89
30/06/2012	7,611.55			7,611.55
30/09/2012	5,555.55	500		6,055.55
31/12/2012	7,537.11		750	6,787.11
31/03/2013	5,436.64			5,436.64

Draft a letter to your friend in approximately 500 words explaining how the investment works, the significance of the two rates of return and the difference between them. Your reply should also include an explanation of the reasons for the decline in investment markets.

Notes

1. You can ignore the impact of any charges.

2. Your friend has some financial knowledge and has a basic knowledge of compound interest. You do not need to explain the different asset classes and their characteristics.

3. The money-weighted rate of return is given by the formula

$$F_0 \times (1+i)^T + \left(C_{t_1} \times (1+i)^{T-t_1} + \ldots + C_{t_n} \times (1+i)^{T-t_n} \right) = F_T$$

   where

   F_0 = fund value at time 0
   F_T = fund value at time T
   C_{t_k} = net cash flow at times $t_1, t_2 \ldots \ldots, t_n$
   i = effective annual rate of return earned in the interval $[0, T]$

4. The time-weighted rate of return is given by the formula

$$\frac{F_{t_1}}{(F_0 + C_0)} \times \frac{F_{t_2}}{(F_{t_1} + C_{t_1})} \times \ldots \ldots \times \frac{F_T}{(F_{t_n} + C_{t_n})} = (1+i)^T$$

   where

   C_{t_k}, F_0, F_T and i are as defined in 3 above
   F_{t_k} = fund value just before the net cash flow due at time t_k

5. You are not expected to carry out detailed calculations.

END OF PAPER