

EXAMINATION

25 May 2018 (am)

Subject F105 — Finance and Investment Fellowship Principles

Time allowed: Three hours

INSTRUCTIONS TO THE CANDIDATE

1. *Use the instructions and password provided at the examination center to log in.*
2. *Submit your answers in Word format only using the template provided. You MAY NOT use any other computer program (e.g. Excel) during the examination.*
3. *Save your work regularly throughout the examination on the supplied computer's hard drive.*
4. *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.*
5. *You must not start typing your answers until instructed to do so by the supervisor.*
6. *Mark allocations are shown in brackets.*
7. *Attempt all nine (9) questions, beginning your answer to each question on a new page.*
8. *Show calculations where this is appropriate.*
9. *If answer booklets are used for any question(s), start each question IN A SEPARATE ANSWER BOOKLET, entering all candidate and examination details on EACH.*

Note: The Actuarial Society of South Africa will not be held responsible for loss of data where candidates have not followed instructions as set out above.

AT THE END OF THE EXAMINATION

Save your answers on the hard drive AND hand in 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.

QUESTION 1

- i. List four possible functions, other than taking responsibility for monetary and inflation policy, for a central bank.

[2]

The central bank of a developing country is responsible for monetary policy and is mandated to maintain inflation within a target band. Other than determining its functions and setting the inflation band, the government has no further influence on the central bank. Due to low economic growth and high unemployment, the government is now questioning central bank independence, and whether monetary policy should rather be determined by the government.

- ii. Discuss the arguments for, and against, the central bank's independence.

[5]

[Total 7]

QUESTION 2

- i. Outline the various forms of private equity investment.

[3]

A large pension fund domiciled in a developed country is currently invested in cash, listed bonds and listed equity. The fund is investigating expanding its asset portfolio to include *alternative* investments.

The pension fund is considering one of three infrastructure investment alternatives:

- (a) Direct investment in fully operational toll road and power station projects.
- (b) Investment in a listed company that has obtained the rights from government to operate its power stations, toll roads, ports and airports.
- (c) Invest as a limited partner in an infrastructure fund (which is financed similarly to venture capital) that builds infrastructure and sells it once completed.

- ii. Discuss the advantages and disadvantages to the pension fund of each alternative (a)-(c) above.

[9]

[Total 12]

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QUESTION 3

- i. List the types of credit events typically covered by a credit default swap.

[2]

Solitude Insurance (Solitude) is an insurer whose management adopts a high risk investment strategy in order to maximise returns for its policyholders and shareholders. As a result, the company maintains a large portfolio of bonds issued by a number of non-rated venture capital companies. This risky strategy means that Solitude needs to hold more capital for credit risk in order to meet regulatory requirements.

Solitude has approached a large reinsurance company that it sometimes shares its non-market risks with, Summerfield Reinsurance (Summerfield), for assistance in reducing the credit risks associated with its unrated bond portfolio. Solitude proposes the purchase of a credit default risk swap (CDS) issued by Summerfield. Under the proposed swap, Summerfield will pay Solitude the face value of a bond issued by a venture company experiencing a defined credit event, in return for an upfront fee.

Summerfield requires an estimate of the fee they should receive for the transaction prior to contacting an investment bank to assist in facilitating the CDS. As Summerfield's investment actuary, you have been requested to calculate a price for the CDS on Solitude's bond portfolio.

You were able to obtain the following information about Solitude's bond portfolio:

	Bond A	Bond B	Bond C	Bond D
Nominal value	R500m	R100m	R200m	R100m
Market value	R310.46m	R65.75m	R159.44m	R101.759m
Coupon rate	0%	0%	0%	10%
Outstanding term (years)	5	3	2	2

- ii. Calculate a price for the CDS on Solitude's bond portfolio assuming an annual effective risk free rate of 7% p.a. and stating any further assumptions made.

[3]

You have indicated to Summerfield that your calculation of the CDS price reflects a "zero basis" price.

- iii. State reasons why the final actual price of the CDS may differ from your calculation.

[2]

Solitude found the price of the CDS to be too high relative to the lower capital requirements resulting from lower credit risk.

- iv. Suggest possible solutions that the two companies should consider.

[3]

[Total 10]

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QUESTION 4

A well established, and privately owned, pharmaceutical company has developed a number of pharmaceuticals that, based on initial clinical trials, look very promising. The company needs to raise significant additional capital to continue with further trials, and the owners have decided to issue shares through an initial public offering (IPO) and to list these shares on the local stock exchange.

- i. Outline how an investment bank can assist the company with this exercise. [3]
- ii. Outline the information that the company should include in the prospectus. [4]

You are an investment analyst working for a stockbroker and you have been asked by an institutional fund manager to place a value on the shares being issued and to recommend whether the IPO represents a suitable investment opportunity.

- iii. Explain how you would proceed with the investigation. [6]
- [Total 13]

QUESTION 5

- i. List the main industries of the FTSE industry classification system. [2]

A small developing country has a stock exchange with four shares. The main index is the Top-2, which consists of the largest two shares by market capitalisation. The index constituents are updated at the end of each quarter.

Company	Measure	31/12/2015	31/03/2016	30/06/2016
A	Number	100	100	120
	Share	200	220	210
	Ex-div	10	0	0
B	Number	50	50	50
	Share	480	500	480
	Ex-div	20	10	10
C	Number	200	200	200
	Share	110	120	130
	Ex-div	3	0	4
D	Number	80	100	80
	Share	240	250	220
	Ex-div	10	0	10

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- ii. Give a formula for an arithmetic weighted total return index at time t , assuming the index at time $(t - 1)$ is K , and using variables for number of shares, share prices and dividends received in the period. [2]
 - iii. Given the information in the accompanying table, calculate a Top-2 total return index for the quarters ending 31 March 2016 and 30 June 2016, using the equation in (ii) and starting with a value of $K = 1,000$ on 31 December 2015. [4]
- [Total 8]

QUESTION 6

In an attempt to improve access to financial services in a largely unbanked developing country, the government is launching a savings initiative in the form of a National Savings Scheme (NSS). Government-appointed agents will collect contributions and pay benefits on behalf of the NSS.

Individuals who join the NSS will be required to contribute a fixed amount per month for 24 months. At the end of the 24 month period NSS members are entitled to receive a return of contributions (without interest), but with those who paid all contributions as required, additionally receiving a bonus payment equal to one months' contribution.

The NSS invests its funds in a multi-asset class portfolio.

- i. Define what is meant by a "risk-free return". [1]
- ii. Explain whether the NSS offers members a risk-free return. [1]

The NSS will also provide each member access to one interest-free loan, of up to 50% of total contributions paid by the member to the date of the loan, during their membership period. The loan will be recovered from the benefit payable at the end of the 24 months.

- iii. Describe four financial risks that these savings schemes may present to the government, and provide an example of a risk-event for each risk mentioned. [8]
- [Total 10]

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QUESTION 7

You are part of a merger and acquisition team consulting to a large multinational conglomerate, Fortress International Holdings. Fortress management has asked your team to advise on the performance of two companies they are considering for potential acquisition:

Livendell Insurance is a well-established and listed insurance company which has grown over the last 20 years through a significant number of acquisitions of smaller life companies. Systems and processes are well maintained but the company has several legacy IT systems that are now outdated.

Mondor Insurance is a general insurance company established only 5 years ago. Management has invested significant resources in modern IT systems that are efficient and flexible allowing the company to be innovative. They have released a new insurance product in the last year.

A summarised version of their balance sheets and profit / loss for the year have been provided below (monetary amounts in R millions):

	Livendell Insurance Co.	Mondor Insurance Co.
<u>Assets</u>		
Investments	3,000	600
Goodwill	800	0
Building	100	0
Computer, Equipment & Patents	50	400
Other Assets	160	20
<u>Total Assets</u>	4,110	1,020
<u>Equity</u>		
Share capital	600	100
Retained earnings	2,000	450
<u>Total Equity</u>	2,600	550
<u>Liabilities</u>		
Insurance liabilities	1,360	200
Loans	50	200
Other Liabilities	100	70
<u>Total Liabilities</u>	1,510	470
<u>Total Equity and Liabilities</u>	4,110	1,120
Profit / Loss for 2017 year	500	-50
Minimum Capital Requirement	1,500	450
No. of shares issued	80 million	10 million
Share price	R20 per share	Unlisted

PLEASE TURN OVER

- i. Calculate the NAV (unadjusted) per share and return on capital for each company, stating any assumptions made. [3]
 - ii. Based on the results of these two measures, and other information provided, comment on the relative performance, and attractiveness to Fortress, of the two companies. [7]
- [Total 10]

QUESTION 8

Signifi is a local motorcycle manufacturer and distributor. They now wish to capitalise on their growing reputation by producing and selling branded clothing, and are considering the acquisition of an existing local clothing manufacturer to carry out their ambition.

- i. Explain the type of acquisition that this would be classified as. [1]
- ii. List other possible reasons for the acquisition. [2]

To finance this acquisition Signifi is issuing a corporate bond.

- iii. Outline the two main reasons for an investor wanting to perform a credit analysis of the bond before deciding whether or not to invest in it. [2]
 - iv. Discuss non company-specific factors that should be considered as part of the credit analysis of the bond. [3]
 - v. Provide possible reasons for discrepancies in the outcome of a credit analysis done by a ratings agency versus the independent research carried out by an investor. [2]
- [Total 10]

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QUESTION 9

A large pension fund in a developed country is reviewing its strategy with respect to active members. The trustees are concerned that the economy is entering a low return environment for the foreseeable future and they have therefore decided to pay closer attention to investment costs.

- i. Outline briefly the relative merits of active versus passive strategies for each of the following components of the fund:
 - (a) Emerging markets (including African) equity portfolio
 - (b) Local bond portfolio
 - (c) Local listed property portfolio
 - (d) Developed markets equity portfolio

[12]

The fund currently has an independent global custodian for its offshore assets. This custodian recently announced its intention to withdraw its services at the next renewal of the service agreement.

- ii. Outline the range of services offered by a global custodian for a pension fund. [3]
- iii. Outline briefly the main issues that the investment manager must consider when deciding on a potential replacement custodian. [2]

The trustees are focusing on corporate governance issues relating to the fund's equity holdings, and they wish to review the fund's approach to voting on the shares it holds.

- iv. Briefly discuss the approaches that could be taken by the fund in dealing with voting on its shares.

[3]

[Total 20]

END OF PAPER