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CIMA

Performance Pillar

P3 – Performance Strategy

23 May 2012 – Wednesday Morning Session

Instructions to candidates

You are allowed three hours to answer this question paper.
You are allowed 20 minutes reading time **before the examination begins** during which you should read the question paper and, if you wish, highlight and/or make notes on the question paper. However, you will **not** be allowed, **under any circumstances**, to open the answer book and start writing or use your calculator during this reading time.
You are strongly advised to carefully read ALL the question requirements before attempting the question concerned (that is all parts and/or sub-questions).
ALL answers must be written in the answer book. Answers written on the question paper will **not** be submitted for marking.
You should show all workings as marks are available for the method you use.
The pre-seen case study material is included in this question paper on pages 2 to 8. The unseen case study material, specific to this examination, is provided on pages 10 to 12.
Answer the compulsory question in Section A on page 13. This page is detachable for ease of reference
Answer TWO of the three questions in Section B on pages 16 to 21.
Maths tables and formulae are provided on pages 23 to 26.
The list of verbs as published in the syllabus is given for reference on page 27.
Write your candidate number, the paper number and examination subject title in the spaces provided on the front of the answer book. Also write your contact ID and name in the space provided in the right hand margin and seal to close.
Tick the appropriate boxes on the front of the answer book to indicate which questions you have answered.

P3 – Performance Strategy

TURN OVER

Pre-seen case study

Introduction
B Supermarkets (B) was founded as a grocery retailer in a European country in 1963. Its sales consist mainly of food and household items including clothing. B now owns or franchises over 15,000 stores world-wide in 36 countries. The company has stores in Europe (in both eurozone and non-eurozone countries), Asia and North America. B's head office is located in a eurozone country. B has become one of the world's largest chains of stores.

B's Board thinks that there are opportunities to take advantage of the rapid economic growth of some Asian countries and the associated increases in demand for food and consumer goods.

Structure
The B Group is structured into a holding company, B, and three subsidiary companies which are located in each of the regions of the world in which it operates (Europe, Asia and North America). The subsidiary companies, referred to as "Regions" within B, are respectively B-Europe, B-Asia and B-North America.

Store operations, sales mix and staffing
B operates four types of store: supermarkets, hypermarkets, discount stores and convenience stores. For the purpose of this case study, the definition of each of these types of store is as follows:

A ***supermarket*** is a self-service store which sells a wide variety of food and household goods such as washing and cleaning materials, cooking utensils and other items which are easily carried by customers out of the store.

A ***hypermarket*** is a superstore or very large store which sells the same type of products as a supermarket but in addition it sells a wide range of other items such as consumer durable white goods, for example refrigerators, freezers, washing machines and furniture. Hypermarkets are often located on out-of-town sites.

A ***discount store*** is a retail store that sells a variety of goods such as electrical appliances and electronic equipment. Discount stores in general usually sell branded products and pursue a high-volume, low priced strategy and aim their marketing at customers who seek goods at prices which are usually less than can be found in a hypermarket.

A ***convenience store*** is a small shop or store in an urban area that sells goods which are purchased regularly by customers. These would typically include groceries, toiletries, alcoholic beverages, soft drinks and confectionery. They are convenient for shoppers as they are located in or near residential areas and are often open for long hours. Customers are willing to pay premium prices for the convenience of having the store close by.

B sells food products and clothing in its supermarkets and hypermarkets at a higher price than many of its competitors because the Board thinks that its customers are prepared to pay higher prices for better quality food products. B also sells good quality consumer durable products in its supermarkets and hypermarkets but it is forced to sell these at competitive prices as there is strong competition for the sale of such goods. B's discount stores sell good quality electrical products usually at lower prices than those charged in its supermarkets and hypermarkets, B only sells electronic equipment in its discount stores. Customers have a greater range from which to choose in the discount stores as compared with supermarkets and hypermarkets because the discount stores specialise in the goods which they sell. B's convenience stores do not have the availability of space to carry a wide range of products and they charge a higher price for the same brand and type of goods which it sells in its supermarkets.

Although B owns most of its stores, it has granted franchises for the operation of some stores which carry its name.

Nearly 0.5 million full-time equivalent staff are employed world-wide in the Group. B tries when possible to recruit local staff to fill job vacancies within its stores.

Value statement and mission
In recognition of the strong competitive and dynamic markets in which it operates, B's Board has established an overall value statement as follows: "We aim to satisfy our customers wherever we trade. We intend to employ different generic competitive strategies depending on the market segment in which our stores trade."

The Board has also produced the following mission statement:

"B practises sustainable investment within a healthy ethical and thoughtful culture and strives to achieve customer satisfaction by giving a courteous and efficient service, selling high quality goods at a reasonable price, sourcing goods from local suppliers where possible and causing the least damage possible to the natural environment. By this, we aim to satisfy the expectations of our shareholders by achieving consistent growth in our share price and also to enhance our reputation for being an environmentally responsible company."

Strategic objectives
The following objectives have been derived from the mission statement:

1. Build shareholder value through consistent growth in the company's share price.
2. Increase customer satisfaction ratings to 95% as measured by customer feedback surveys.
3. Increase commitment to local suppliers by working towards achieving 40% of our supplies from sources which are local to where B stores trade.
4. Reduce carbon emissions calculated by internationally agreed measures by at least 1% per year until B becomes totally carbon neutral.
5. Maximise returns to shareholders by employing different generic competitive strategies depending on the market segment in which B stores trade.

Financial objectives
The Board has set the following financial objectives:

1. Achieve consistent growth in earnings per share of 7% each year.
2. Maintain a dividend pay-out ratio of 50% each year.
3. Gearing levels as measured by long-term debt divided by long-term debt plus equity should not exceed 40% based on book value.

Governance
The main board comprises the Non-executive Chairman, the Chief Executive and nine Executive directors. These cover the functions of finance, human resources, corporate affairs (including legal and public relations), marketing, planning and procurement. There is also one executive director for each of the three regions, being the Regional Managing Directors of B-Europe, B-Asia and B-North America. There are also nine non-executive main board members in addition to the Chairman.

The main Board of Directors has separate committees responsible for audit, remuneration, appointments, corporate governance and risk assessment and control. The Risk Assessment and Control Committee's tasks were formerly included within the Audit Committee's role. It was agreed by the Board in 2009 that these tasks should be separated out in order not to overload the Audit Committee which has responsibilities to review the probity of the company. B's expansion has been very rapid in some countries. The expansion has been so rapid that B has not been able to carry out any internal audit activities in some of these countries to date. The regional boards do not have a committee structure.

Each of the Regional Managing Directors chairs his or her own Regional Board. All of the Regional Boards have their own directors for finance, human resources, corporate affairs, marketing, planning and procurement but their structure is different for the directors who have responsibility for the stores. In B-Asia, one regional director is responsible for the hypermarkets and supermarkets and another is responsible for discount stores and convenience stores. In B-North America, one regional director is responsible for the hypermarkets and supermarkets and another is responsible for discount stores (B does not have any convenience stores in North

America). In B-Europe there is one regional director responsible for supermarkets and hypermarkets, one for discount stores and one for convenience stores. In all regions the regional directors have line accountability to their respective regional managing director and professional accountability to the relevant main board director. There are no non-executive directors on the regional boards. Appendix 1 shows the main board and regional board structures.

Treasury
Each of B's three regions has a regional treasury department managed by a regional treasurer who has direct accountability to the respective Regional Director of Finance and professional accountability to the Group Treasurer. The Group Treasurer manages the central corporate treasury department which is located in B's head office. The Group Treasurer, who is not a main board member, reports to the Director of Finance on the main board.

Shareholding, year-end share prices and dividends paid for the last five years
B is listed on a major European stock exchange within the eurozone and it wholly owns its subsidiaries. There are five major shareholders of B, including employees taken as a group, which between them hold 25% of the 1,350 million total shares in issue. The major shareholders comprise two long term investment trusts which each owns 4%, a hedge fund owns 5%, employees own 5% and the founding family trust owns 7% of the shares. The remaining 75% of shares are owned by the general public.

The year-end share prices and the dividends paid for the last five years were as follows:

	2007	*2008*	*2009*	*2010*	*2011*
	€	€	€	€	€
Share price at 31 December	47.38	25.45	28.68	29.44	31.37
Net Dividend per share	1.54	1.54	1.54	1.62	1.65

Planning and management control
B has a very structured planning process. Each regional board produces a five year strategic plan for its region relating to specific objectives set for it by the main board and submits this to the main board for approval. The main board then produces a consolidated strategic plan for the whole company. This is reviewed on a three yearly cycle and results in a revised and updated group five year plan being produced every three years.

B's management control system, which operates throughout its regions and at head office, is well known in the industry to be bureaucratic and authoritarian. Strict financial authority levels for development purposes are imposed from the main Board. There is tension between the main Board and the regional boards. The regional board members feel that they are not able to manage effectively despite being located much closer to their own regional markets than the members of the main Board. The main Board members, on the other hand, think that they need to exercise tight control because they are remote from the markets. This often stifles planning initiatives within each region. This tension is also felt lower down the organisation as the regional board members exercise strict financial and management control over operational managers in their regions in order to ensure that the main Board directives are carried out.

Competitive overview
B operates in highly competitive markets for all the products it sells. The characteristics of each of the markets in which it operates are different. For example, there are different planning restrictions applying within each region. In some countries, B is required to operate each of its stores in a partnership arrangement with local enterprises, whereas no such restriction exists within other countries in which it trades. B needs to be aware of different customer tastes and preferences which differ from country to country. The following table provides a break-down of B's stores in each region.

	B Europe	*B Asia*	*B North America*
Supermarkets and hypermarkets	3,456	619	512
Discount stores	5,168	380	780
Convenience stores	4,586	35	

B is one of the largest retailing companies in the world and faces different levels of competition in each region. B's overall market share in terms of retail sales for all supermarkets, hypermarkets, discount stores and convenience stores in each of its regions is as follows:

	Market share
Europe	20%
Asia	1%
North America	1.5%

The following table shows the sales revenue and net operating profit earned by B in each of its regions for the year ended 31 December 2011:

	B Europe	*B Asia*	*B North America*
	€ million	*€ million*	*€ million*
Revenue	89,899	10,105	9,708
Net Operating Profit	4,795	743	673

B is constantly seeking other areas of the world into which it can expand, especially within Asia where it perceives many countries have an increasing population and strengthening economies.

Corporate Social Responsibility (CSR)
B is meeting its CSR obligations by establishing environmental targets for carbon emissions (greenhouse gas emissions), careful monitoring of its supply chain, undertaking sustainable investments and investing in its human capital.

Environmental targets for carbon emissions:
B's main board is keen to demonstrate the company's concern for the environment by pursuing continuous improvement in the reduction of its carbon emissions and by developing ways of increasing sustainability in its trading practices. A number of environmental indicators have been established to provide transparency in B's overall performance in respect of sustainability. These published measures were verified by B's statutory auditor and are calculated on a like-for-like basis for the stores in operation over the period measured.

In the year ended 31 December 2011, B reduced its consumption of kilowatt hours (kWh) per square metre of sales area as compared with the year ended 31 December 2008 by 9%. The target reduction for that period was 5%. In the same period it reduced the number of free disposable plastic bags provided to customers per square metre of sales area, by 51% against a target of 60%. Its overall greenhouse gas emissions (measured by kilogrammes of carbon dioxide per square metre of sales area) reduced by 1% in 2011 which was exactly on target.

B provides funding for the development of local amenity projects in all of the countries where B stores operate. (An amenity project is one which provides benefit to the local population, such as providing a park, community gardens or a swimming pool.)

Distribution and sourcing:
Distribution from suppliers across such a wide geographical area is an issue for B. While supplies are sourced from the country in which a store is located as much as possible, there is nevertheless still a requirement for transportation across long distances either by road or air. Approximately 20% of the physical quantity of goods sold across the group as a whole are sourced locally, that is within the country in which the goods are sold. These tend to be perishable items such as fruit and vegetables. The remaining 80% of goods are sourced from large international manufacturers and distributors. These tend to be large items such as electrical or electronic equipment which are bought under contracts which are set up by the regional procurement departments. B, due to its size and scope of operations, is able to place orders for goods made to its own specification and packaged as under its own brand label. Some contracts are agreed between manufacturers and the Group Procurement Director for the supply of goods to the whole of the B group world-wide.

B's inventory is rarely transported by rail except within Europe. This has resulted in lower average reductions in carbon emissions per square metre of sales area by stores operated by B-

Asia and B-North America than for those stores operated by B-Europe. This is because the carbon emission statistics take into account the transportation of goods into B's stores.

Sustainable investments:
B aspires to become carbon neutral over the long term. The Board aims to reduce its carbon emissions by investing in state of the art technology in its new store developments and by carrying out modifications to existing stores.

Human Resources:
B prides itself on the training it provides to its staff. The training of store staff is carried out in store by specialist teams which operate in each country where B trades. In this way, B believes that training is consistent across all of its stores. In some countries, the training is considered to be at a sufficiently high level to be recognised by national training bodies. The average number of training hours per employee in the year ended 31 December 2011 was 17 compared with 13 hours in the year ended 31 December 2010. In 2011, B employed 45% more staff with declared disabilities compared with 2010.

Information systems and inventory management
In order to operate efficiently, B's Board has recognised that it must have up-to-date information systems including electronic point of sale (EPOS) systems. An EPOS system uses computers or specialised terminals that can be combined with other hardware such as bar-code readers to accurately capture the sale and adjust the inventory levels within the store. EPOS systems installation is on-going. B has installed EPOS systems in its stores in some countries but not in all its stores world-wide.

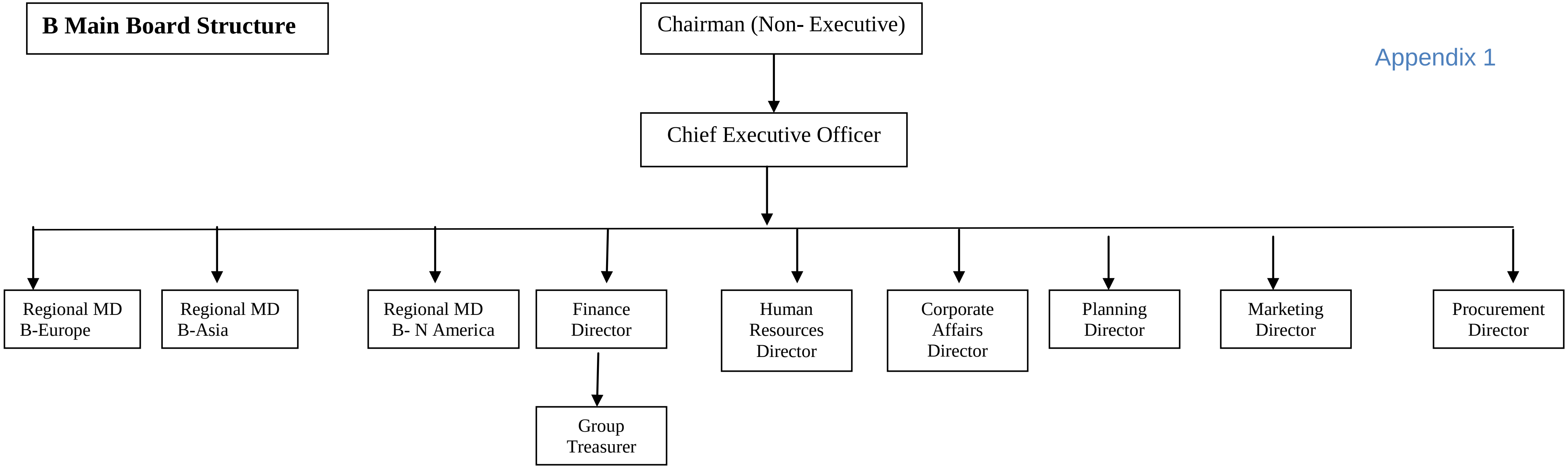
B's information systems are not perfect as stock-outs do occur from time-to-time, especially in the European stores. This can be damaging to sales revenue when stock-outs occur during peak sales periods such as the days leading up to a public holiday. In Asia and North America in particular, B's information technology systems sometimes provide misleading information. This has led to doubts in the minds of some head office staff about just how robust are B's inventory control systems.

As is normal in chain store groups, there is a certain degree of loss through theft by staff and customers. Another way that loss is suffered is through goods which have gone past their "sell-by" date and mainly relates to perishable food items which are wasted as they cannot be sold to the public. In most countries, such food items which cannot be sold to the public may be sold to local farmers for animal feed.

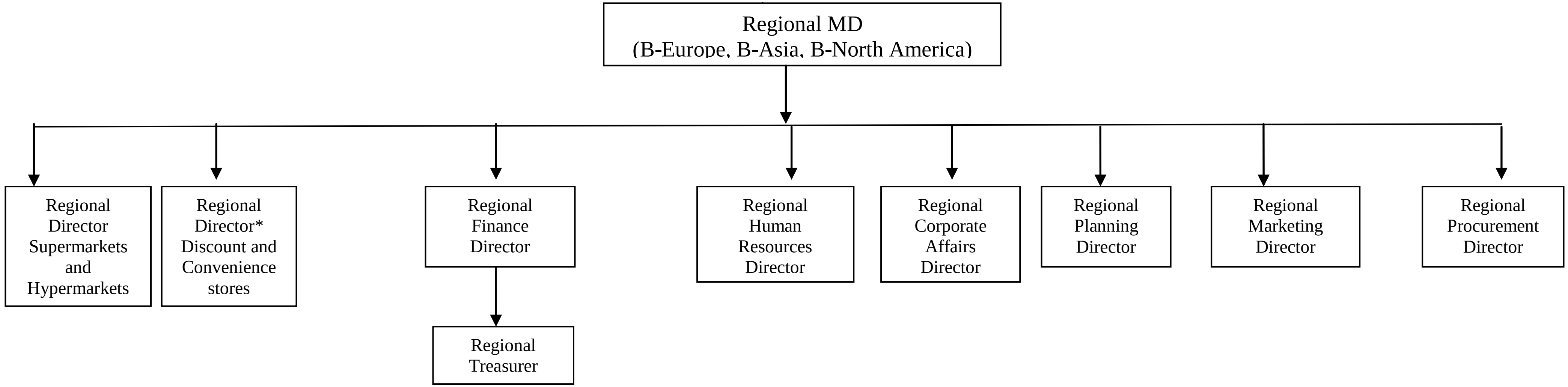
Regulatory issues
B's subsidiaries in Asia and North America have sometimes experienced governmental regulatory difficulties in some countries which have hindered the installation of improved information systems. To overcome some of these regulatory restrictions, B-Asia and B-North America have, on occasions, resorted to paying inducements to government officials in order for the regulations to be relaxed.

Appendix 1

B Main Board Structure



B Regional Board Structure



*Applies to B-Asia only. In B-North America, where there are no Convenience stores, there is a Regional Director responsible for Discount stores as well as the Regional Director responsible for Supermarkets and Hypermarkets. B-Europe's structure has three Regional Directors responsible for the stores, one each responsible for Supermarkets and Hypermarkets, Discount Stores and Convenience Stores.

Extract of B’s income statement and statement of financial position.

Income statement for the year ended 31 December 2011

	Notes	*€ million*
Revenue		109,712
Operating costs		(103,501)
Net operating profit		6,211
Interest income		165
Finance costs		(852)
Corporate income tax		(1,933)
PROFIT FOR THE YEAR		3,591

Statement of financial position as at 31 December 2011

		€ million
ASSETS		
Non-current assets		57,502
Current assets		
Inventories		7,670
Trade and other receivables		1,521
Cash and cash equivalents		3,847
Total current assets		13,038
Total assets		70,540
EQUITY AND LIABILITIES		
Equity		
Share capital	1	2,025
Share premium		3,040
Retained earnings		18,954
Total equity		24,019
Non-current liabilities		
Long term borrowings		15,744
Current liabilities		
Trade and other payables		30,777
Total liabilities		46,521
Total equity and liabilities		70,540

Notes:

1. There are 1,350 million €1.50 shares currently in issue. The share price at 31 December 2011 was €31.37.

End of Pre-seen Material

The unseen material begins on page 11

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SECTION A – 50 MARKS

[You are advised to spend no longer than 90 minutes on this question.]

ANSWER THIS QUESTION. THE QUESTION REQUIREMENTS ARE ON PAGE 13, WHICH IS DETACHABLE FOR EASE OF REFERENCE

Question One

Unseen case material

Entry to country A
B's board is keen to expand the company by opening stores in new countries. Retailers often find it difficult to establish themselves in new overseas markets because consumer tastes vary considerably. It is often helpful to explore potential markets by experimenting with a single store before committing to major investments throughout a country.

B is planning to test the market in country A, which is a major Asian country that has a substantial population. Although a large proportion of the population is relatively poor there are significant numbers of people who are sufficiently affluent for B to view them as a profitable target market. Two major retailing companies already have a strong presence in country A. Both of these companies were founded in that country. B will be the first multinational retailer to attempt to break into country A.

B plans to test consumer reaction by opening a hypermarket in A's capital city. This store will be launched with a major advertising campaign intended to develop brand awareness in country A and also to provide B with a better insight into the issues associated with operating in that country. The advertising campaign will be followed by detailed market research to measure consumer reaction to B's brand in country A.

B's plans to enter country A have been heavily publicised in the business news in B's home country. B's press release indicated that the board is confident that the new store will be the first of many in country A and that further overseas markets are under consideration.

B's hypermarkets have a standard layout and they tend to stock the same ranges of goods regardless of the country in which they operate. Both the layout and the range of goods can be modified if there is a possibility that local tastes and culture make it inappropriate or unprofitable to sell the standard range or to promote products that are unlikely to appeal to local markets. For example, B sells its own "Beebrand" range of goods with white packaging in most countries, but a different colour is used in Asian countries because white is often associated with mourning in Asia.

B's marketing department has suggested that before the hypermarket is opened B should seek advice from a retail consultancy that is based in country A's capital city in order to gain an awareness of any major issues. For example, many of the products that B sells in Europe and America could be considered offensive by a large proportion of the population of country A. B's chief executive is concerned that taking the advice of such consultants would defeat the purpose of the investment in country A. The objective of the investment is to establish B's style of retailing in country A and promote B's values with the intention of changing consumer attitudes in country A.

Long-term borrowings
B's long-term borrowings include a variable rate loan of EUR 7,000 million on which interest of EURIBOR plus 3.8% is being charged. This loan was taken out four years ago and is not due for repayment for another six years.

B's Finance Director did not work for B when the loan was taken out. She believes that the company should have taken out a fixed rate loan even though the fixed rate that was available then was higher than the variable rate. She is concerned that B is vulnerable to an increase in interest rates for two reasons: firstly, borrowing heavily using variable rate debt means that an increase in interest rates will prove expensive and, secondly, consumer demand can be affected by rising interest rates. The Finance Director believes that the company should have taken out a fixed interest loan and she has investigated some of the ways in which B might reduce the risks associated with the variable rate borrowing.

A major commercial bank has given B an indication that it would be possible to arrange a swap whereby the bank would enter into a swap arrangement under which B would pay a fixed rate of interest of 7.2% for the remaining six years of its existing variable-rate loan. At present EURIBOR is 1.1%.

B's Finance Director believes that the EURIBOR will soon rise to 2.0%, despite most economic commentators stating that interest rates are unlikely to increase by much within the next twelve months.

The Finance Director's assistant has suggested that the company should investigate the use of alternatives to a swap, such as forward rate agreements or interest rate options. The Finance Director has stated that there is very little point in such an investigation because the alternatives to swaps tend to be designed to deal with short term interest rate movements and so they would offer very little protection against the movements that could occur over the next six years. The Finance Director does not believe that there is any point in purchasing a sequence of short term instruments over the next six years.

IT system
B's accounting system is based around a smart-retailing package that incorporates both hardware and software in all stores. At present all of the inventory that arrives at each store is tracked using barcodes. Whenever a consignment of inventory is received, a staff member uses a handheld barcode reader to scan the codes printed on the packaging. That information is transmitted from the reader to the store's inventory management system. Similarly, all goods are scanned at the point of sale (or point of despatch for large items, such as televisions, that are purchased in store but dispatched from the store's warehouse). Consequently the inventory system is updated with relatively little human effort.

One area of inventory management that remains very labour-intensive is the physical counting of inventory that is necessary to identify any losses that may have occurred due to theft or damage. Every store is required to conduct frequent checks on high-value items by having staff conduct physical counts of specific items. The results of these counts are then compared to the inventory records. The counting can be time-consuming because items such as small electrical goods may have some inventory displayed and available for sale in the store while bulk supplies are held in one or more locations in the store's warehouse. Such items can have high unit costs and so the count must be accurate and must also involve teams of two members of staff so that each can corroborate the accuracy of the count.

B's Finance Director is keen to introduce a new system for managing inventory. Many manufacturers attach Radio Frequency Identification (RFID) tags to their products. These are self-adhesive tags that have circuitry embedded in them that allows the data they contain to be read by a device that emits a radio wave that is capable of powering any RFID tags within short range. When powered in this way the tags transmit a code back to the reader. All of the suppliers who produce B's electrical and electronic goods for resale already fit RFID tags to all of their products. Large items, such as cookers and freezers, have the tags stuck to the back of the items themselves. Smaller items, such as shavers and hairdryers, have the tags stuck to the inside of each individual item's packaging.

There is a standard format for the data that is embedded in an RFID tag. That makes it easy for a retailer such as B to be certain of being able to capture all the information that is required for inventory management purposes. Each tag also carries an individual tag number that makes it possible for the reader to count the precise number of items of the same type without any risk of double counting. For example, a reader fitted to the door of the goods received area can scan a

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pallet of goods being delivered and immediately record the arriving inventory without B's staff having to take any action. Another reader attached to the door leading from the warehouse to the retail area will track the movement of the goods when they are taken for display or sale. Finally, readers at the point of sale can identify when tagged items are sold.

Inventory counts would be undertaken by using portable readers that count tagged inventory and log the unique code numbers of each item held. That means that one member of staff can check holdings of a particular product by taking the reader to the areas where that product is stored and activating the reader. The tags themselves cannot be reprogrammed after they have been manufactured and the software in the reader cannot be tampered with and so the system is claimed to be secure.

The Finance Director believes that the RFID technology will simplify the management of inventory and will reduce the time that has to be spent on inventory control. She has commissioned a pilot programme to test this system in the management of electrical goods at one of B's hypermarkets.

The requirement for Question One is on page 13

Required:

(a)

(i) **Discuss** TWO ways in which B's investment in country A could adversely affect the relationship between B's board and the shareholders of B.

(8 marks)

(ii) **Evaluate** the risk that B's venture in country A will fail because of cultural differences.

(8 marks)

(b)

(i) **Evaluate** the risks for B arising from interest rate fluctuations.

(6 marks)

(ii) **Discuss** the potential risks and benefits that could arise from the swap arrangement with the major commercial bank. Your answer should be supported by calculations that show the effects of the swap a) assuming that EURIBOR remains constant and b) assuming that the rate increases to 2%.

(6 marks)

(iii) **Evaluate** the Finance Director's statement that there is no point in purchasing a sequence of short term instruments to lower exposure to interest rate risks over the remaining six years of the loan.

(6 marks)

(c)

(i) **Evaluate** the potential effectiveness of RFID technology for the identification and prevention of fraud by staff.

(8 marks)

(ii) **Recommend** tests that B's internal audit department could conduct to evaluate the effectiveness of the RFID technology while the pilot programme is operating.

(8 marks)

(Total for Question One = 50 marks)

(Total for Section A = 50 marks)

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SECTION B – 50 MARKS

[You are advised to spend no longer than 45 minutes on each question in this section.]

ANSWER *TWO* OF THE THREE QUESTIONS

Question Two

H is a legal firm that specialises in pursuing small claims for compensation for personal injuries that its clients have suffered. The company advertises its services on television and guarantees that its clients do not have to pay any legal fees even if they lose the case. The losing side is normally liable for the other party's legal fees and so H's fee is paid by the negligent party who caused the injury, provided H wins the case for its client.

H has to take great care when evaluating applications from potential clients. If H loses the case it will not be paid for any of the work it has done on the case and H will also be liable for the other side's legal fees. To reduce the risk of taking on cases that it might subsequently lose, H uses highly trained legal staff to conduct telephone interviews with applicants. These staff work in a telephone call centre and ask each potential client a series of questions to establish the likelihood of winning that case. This procedure has proven to be very reliable: H has won more than 80% of the cases that it has accepted. Unfortunately, this system is expensive because H has to pay high salaries in order to recruit suitably qualified legal staff.

H's Head of Information Technology (IT) has suggested that the legal staff in the call centre could be replaced by an 'expert system'. Such a system could be manned by operators who would not require a great deal of training or expertise. The expert system will be an interactive software package that will provide call centre staff with a series of questions to ask potential clients. The call centre operators will be trained to explain the meaning of the questions if necessary and to input the responses into the system in a consistent way. The expert system will choose the questions that are asked to reflect information that has already been input. For example, if a case involves a road traffic accident then there will be different questions depending on whether the police were involved in the incident and whether either party has been charged with a motoring offence. Once all of the questions have been answered the software will provide the operator with a recommendation as to whether the case should be accepted, rejected or referred to a lawyer in H's legal department for further consideration.

H's Head of IT believes that a well-designed expert system will be as reliable as the legal staff who are presently employed. It will be expensive to develop, but it will save a great deal of money in the long term because the call centre operators will be cheaper to employ.

The expert system would be developed by an external consultant who would act as a "knowledge engineer". The knowledge engineer would work with the senior lawyers in H's legal department to identify the logic that runs through the evaluation of a potential client's case and codify that logic using a standard expert system package. H's senior lawyers would then have to assist in testing the expert system. Finally, call centre staff will have to be trained in the operation of the expert system.

Required:

(a) **Advise** H's directors on the risks of using an expert system instead of legal staff at the call centre.

(13 marks)

(b) **Recommend**, giving reasons, the procedures that should be in place to ensure the successful design and testing of the expert system.

(12 marks)

(Total for Question Two = 25 marks)

Section B continues on the next page

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Question Three

J manufactures specialised electronic equipment in the UK. The company has just won its first export order and will receive payment of USD 15 million in three months. J's Chief Executive is concerned that the USD may decline against the GBP during the three months and has asked the company's bank to offer a guaranteed price for the currency when it is received.

The bank has offered to enter into a forward contract with J at a rate of GBP1 = USD 1.65.

J's Chief Executive is unhappy with this offer because the present exchange rate is GBP1 = USD 1.60. Given the size of the transaction, this constitutes a major additional cost that J had not budgeted for when setting its selling price. J's Chief Executive would rather wait until the payment is received in the hope that the spot rate at that time is better than the GBP1 = USD 1.65 offered by the bank.

J's Chief Executive is concerned that the differential rate being charged by the bank is unfair. He believes that global economics are so complicated that it is impossible to forecast exchange rate movements and the movements in the exchange rate are just as likely to be favourable as unfavourable to J over the next three months.

J's bank manager has pointed out that the rate offered is in line with market expectations and that it is unrealistic for the Chief Executive to ask the bank to commit itself to guaranteeing that today's exchange rate can be obtained on a transaction that will occur in three months.

The bank manager has recommended that J appoints a full-time corporate treasurer to take on the responsibility of the treasury function and relieve the Chief Executive of that burden.

All of J's directors come from an electronic engineering background and the small administrative staff provides basic clerical and book-keeping support.

Required:

(a) **Evaluate** the respective arguments of J's Chief Executive and the bank manager about the rate offered by the bank on the forward contract.

(9 marks)

(b) **Evaluate** the bank manager's recommendation to appoint a corporate treasurer.

(8 marks)

(c) **Recommend**, stating reasons, the steps that the directors of J should take in the selection of a suitable person for the role of corporate treasurer.

(8 marks)

(Total for Question Three = 25 marks)

Section B continues on page 20

TURN OVER

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Question Four

G manufactures a range of valves that are used in the manufacture of car braking systems. G sells its components to several major car manufacturers. It is difficult to manufacture a perfectly serviceable valve every time because the manufacturing process is complicated and involves several steps. After each step has been completed the company runs a series of quality checks and valves that fail are discarded before they go on to the next stage or are accepted into inventory. The rejection rates vary from step to step, but can be as high as 5% in some stages of the production process. Overall, G budgets for a 20% rejection rate when estimating the size of production runs.

There are substantial costs associated with quality checks and rejections. Approximately 20% of staff time is devoted to quality control. The rejected components have no scrap value and so G has to pay to dispose of them in an environmentally acceptable manner.

Staff morale appears to have a role in the determination of quality. Failure rates are higher on Friday afternoons and Monday mornings when employees are distracted by looking forward to the weekend or demotivated by the start of the working week. Also major televised sporting events broadcast late at night can lead to deterioration in the quality of the following day's output because staff have stayed up to watch the event.

The failure rate depends largely upon the care with which the manufacturing machinery has been set up and calibrated before a batch of parts is processed, although that is not the only factor. For example, a defective part may have passed through earlier quality checks unnoticed and could cause a failure at a later stage.

G's board is keen to enjoy the benefits associated with total quality management (TQM), but has not committed itself to a full implementation of TQM. As an initial step the board asked production supervisors to come into work an hour early once a week for a quality circle meeting. The board had intended to devote more time and effort to TQM if this initial step had proved successful, but the directors have been disappointed by the initial feedback, which can be summarised as follows:

- The supervisors have proposed that the working week be reorganised so that staff can leave early on a Friday afternoon and have longer breaks on a Monday. This proposal is supported by a revised schedule that would make up for this time by having staff work longer hours in the middle of the week. G's board has rejected this proposal because there would be some additional administrative costs associated with the proposed new working arrangements.

- The supervisors wish to reallocate some of the present quality control staff to production so that more staff time would be available to permit production processes to be properly set up. The supervisors believe that production staff have to work at close to 100% of their capacity and that such effort is not consistent with producing high quality work. Reducing the pressure would lead to a dramatic reduction in failed parts and so the company would need fewer quality inspectors. G's board has rejected this proposal because it believes that staff should be encouraged to work harder and not to slow down. Also, the board would expect any reduction in the quality control staff to offer the opportunity to reduce staffing and save costs.

Required:

(a)

(i) **Advise** G's board on the shortcomings of the approach that it has taken to TQM.

(8 marks)

(ii) **Recommend**, stating reasons, the actions that G's board should have taken in order to successfully introduce TQM within G.

(7 marks)

(b) **Advise** G's board on the risks associated with reducing the number of quality control staff in the factory.

(10 marks)

(Total for Question Four = 25 marks)

(Total for Section B = 50 marks)

End of Question Paper

Maths tables and formulae are on pages 23 to 26

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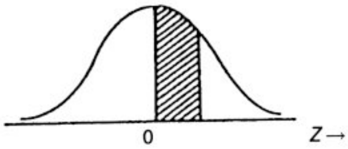
AREA UNDER THE NORMAL CURVE

This table gives the area under the normal curve between the mean and a point Z standard deviations above the mean. The corresponding area for deviations below the mean can be found by symmetry.



$Z = \frac{(x-\mu)}{\sigma}$	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	.0000	.0040	.0080	.0120	.0159	.0199	.0239	.0279	.0319	.0359
0.1	.0398	.0438	.0478	.0517	.0557	.0596	.0636	.0675	.0714	.0753
0.2	.0793	.0832	.0871	.0910	.0948	.0987	.1026	.1064	.1103	.1141
0.3	.1179	.1217	.1255	.1293	.1331	.1368	.1406	.1443	.1480	.1517
0.4	.1554	.1591	.1628	.1664	.1700	.1736	.1772	.1808	.1844	.1879
0.5	.1915	.1950	.1985	.2019	.2054	.2088	.2123	.2157	.2190	.2224
0.6	.2257	.2291	.2324	.2357	.2389	.2422	.2454	.2486	.2518	.2549
0.7	.2580	.2611	.2642	.2673	.2704	.2734	.2764	.2794	.2823	.2852
0.8	.2881	.2910	.2939	.2967	.2995	.3023	.3051	.3078	.3106	.3133
0.9	.3159	.3186	.3212	.3238	.3264	.3289	.3315	.3340	.3365	.3389
1.0	.3413	.3438	.3461	.3485	.3508	.3531	.3554	.3577	.3599	.3621
1.1	.3643	.3665	.3686	.3708	.3729	.3749	.3770	.3790	.3810	.3830
1.2	.3849	.3869	.3888	.3907	.3925	.3944	.3962	.3980	.3997	.4015
1.3	.4032	.4049	.4066	.4082	.4099	.4115	.4131	.4147	.4162	.4177
1.4	.4192	.4207	.4222	.4236	.4251	.4265	.4279	.4292	.4306	.4319
1.5	.4332	.4345	.4357	.4370	.4382	.4394	.4406	.4418	.4430	.4441
1.6	.4452	.4463	.4474	.4485	.4495	.4505	.4515	.4525	.4535	.4545
1.7	.4554	.4564	.4573	.4582	.4591	.4599	.4608	.4616	.4625	.4633
1.8	.4641	.4649	.4656	.4664	.4671	.4678	.4686	.4693	.4699	.4706
1.9	.4713	.4719	.4726	.4732	.4738	.4744	.4750	.4756	.4762	.4767
2.0	.4772	.4778	.4783	.4788	.4793	.4798	.4803	.4808	.4812	.4817
2.1	.4821	.4826	.4830	.4834	.4838	.4842	.4846	.4850	.4854	.4857
2.2	.4861	.4865	.4868	.4871	.4875	.4878	.4881	.4884	.4887	.4890
2.3	.4893	.4896	.4898	.4901	.4904	.4906	.4909	.4911	.4913	.4916
2.4	.4918	.4920	.4922	.4925	.4927	.4929	.4931	.4932	.4934	.4936
2.5	.4938	.4940	.4941	.4943	.4945	.4946	.4948	.4949	.4951	.4952
2.6	.4953	.4955	.4956	.4957	.4959	.4960	.4961	.4962	.4963	.4964
2.7	.4965	.4966	.4967	.4968	.4969	.4970	.4971	.4972	.4973	.4974
2.8	.4974	.4975	.4976	.4977	.4977	.4978	.4979	.4980	.4980	.4981
2.9	.4981	.4982	.4983	.4983	.4984	.4984	.4985	.4985	.4986	.4986
3.0	**.49865**	.4987	.4987	.4988	.4988	.4989	.4989	.4989	,4990	,4990
3.1	**.49903**	.4991	.4991	.4991	.4992	.4992	.4992	.4992	.4993	.4993
3.2	**.49931**	.4993	.4994	.4994	.4994	.4994	.4994	.4995	.4995	.4995
3.3	**.49952**	.4995	.4995	.4996	.4996	.4996	.4996	.4996	.4996	.4997
3.4	**.49966**	.4997	.4997	.4997	.4997	.4997	.4997	.4997	.4997	.4998
3.5	**.49977**									

PRESENT VALUE TABLE

Present value of $1, that is $(1+r)^{-n}$ where r = interest rate; n = number of periods until payment or receipt.

Periods	Interest rates (*r*)									
(*n*)	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909
2	0.980	0.961	0.943	0.925	0.907	0.890	0.873	0.857	0.842	0.826
3	0.971	0.942	0.915	0.889	0.864	0.840	0.816	0.794	0.772	0.751
4	0.961	0.924	0.888	0.855	0.823	0.792	0.763	0.735	0.708	0.683
5	0.951	0.906	0.863	0.822	0.784	0.747	0.713	0.681	0.650	0.621
6	0.942	0.888	0.837	0.790	0.746	0.705	0.666	0.630	0.596	0.564
7	0.933	0.871	0.813	0.760	0.711	0.665	0.623	0.583	0.547	0.513
8	0.923	0.853	0.789	0.731	0.677	0.627	0.582	0.540	0.502	0.467
9	0.914	0.837	0.766	0.703	0.645	0.592	0.544	0.500	0.460	0.424
10	0.905	0.820	0.744	0.676	0.614	0.558	0.508	0.463	0.422	0.386
11	0.896	0.804	0.722	0.650	0.585	0.527	0.475	0.429	0.388	0.350
12	0.887	0.788	0.701	0.625	0.557	0.497	0.444	0.397	0.356	0.319
13	0.879	0.773	0.681	0.601	0.530	0.469	0.415	0.368	0.326	0.290
14	0.870	0.758	0.661	0.577	0.505	0.442	0.388	0.340	0.299	0.263
15	0.861	0.743	0.642	0.555	0.481	0.417	0.362	0.315	0.275	0.239
16	0.853	0.728	0.623	0.534	0.458	0.394	0.339	0.292	0.252	0.218
17	0.844	0.714	0.605	0.513	0.436	0.371	0.317	0.270	0.231	0.198
18	0.836	0.700	0.587	0.494	0.416	0.350	0.296	0.250	0.212	0.180
19	0.828	0.686	0.570	0.475	0.396	0.331	0.277	0.232	0.194	0.164
20	0.820	0.673	0.554	0.456	0.377	0.312	0.258	0.215	0.178	0.149

Periods	Interest rates (*r*)									
(*n*)	11%	12%	13%	14%	15%	16%	17%	18%	19%	20%
1	0.901	0.893	0.885	0.877	0.870	0.862	0.855	0.847	0.840	0.833
2	0.812	0.797	0.783	0.769	0.756	0.743	0.731	0.718	0.706	0.694
3	0.731	0.712	0.693	0.675	0.658	0.641	0.624	0.609	0.593	0.579
4	0.659	0.636	0.613	0.592	0.572	0.552	0.534	0.516	0.499	0.482
5	0.593	0.567	0.543	0.519	0.497	0.476	0.456	0.437	0.419	0.402
6	0.535	0.507	0.480	0.456	0.432	0.410	0.390	0.370	0.352	0.335
7	0.482	0.452	0.425	0.400	0.376	0.354	0.333	0.314	0.296	0.279
8	0.434	0.404	0.376	0.351	0.327	0.305	0.285	0.266	0.249	0.233
9	0.391	0.361	0.333	0.308	0.284	0.263	0.243	0.225	0.209	0.194
10	0.352	0.322	0.295	0.270	0.247	0.227	0.208	0.191	0.176	0.162
11	0.317	0.287	0.261	0.237	0.215	0.195	0.178	0.162	0.148	0.135
12	0.286	0.257	0.231	0.208	0.187	0.168	0.152	0.137	0.124	0.112
13	0.258	0.229	0.204	0.182	0.163	0.145	0.130	0.116	0.104	0.093
14	0.232	0.205	0.181	0.160	0.141	0.125	0.111	0.099	0.088	0.078
15	0.209	0.183	0.160	0.140	0.123	0.108	0.095	0.084	0.079	0.065
16	0.188	0.163	0.141	0.123	0.107	0.093	0.081	0.071	0.062	0.054
17	0.170	0.146	0.125	0.108	0.093	0.080	0.069	0.060	0.052	0.045
18	0.153	0.130	0.111	0.095	0.081	0.069	0.059	0.051	0.044	0.038
19	0.138	0.116	0.098	0.083	0.070	0.060	0.051	0.043	0.037	0.031
20	0.124	0.104	0.087	0.073	0.061	0.051	0.043	0.037	0.031	0.026

Cumulative present value of $1 per annum, Receivable or Payable at the end of each year for *n* years $\frac{1-(1+r)^{-n}}{r}$

Periods (*n*)	Interest rates (*r*)									
	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909
2	1.970	1.942	1.913	1.886	1.859	1.833	1.808	1.783	1.759	1.736
3	2.941	2.884	2.829	2.775	2.723	2.673	2.624	2.577	2.531	2.487
4	3.902	3.808	3.717	3.630	3.546	3.465	3.387	3.312	3.240	3.170
5	4.853	4.713	4.580	4.452	4.329	4.212	4.100	3.993	3.890	3.791
6	5.795	5.601	5.417	5.242	5.076	4.917	4.767	4.623	4.486	4.355
7	6.728	6.472	6.230	6.002	5.786	5.582	5.389	5.206	5.033	4.868
8	7.652	7.325	7.020	6.733	6.463	6.210	5.971	5.747	5.535	5.335
9	8.566	8.162	7.786	7.435	7.108	6.802	6.515	6.247	5.995	5.759
10	9.471	8.983	8.530	8.111	7.722	7.360	7.024	6.710	6.418	6.145
11	10.368	9.787	9.253	8.760	8.306	7.887	7.499	7.139	6.805	6.495
12	11.255	10.575	9.954	9.385	8.863	8.384	7.943	7.536	7.161	6.814
13	12.134	11.348	10.635	9.986	9.394	8.853	8.358	7.904	7.487	7.103
14	13.004	12.106	11.296	10.563	9.899	9.295	8.745	8.244	7.786	7.367
15	13.865	12.849	11.938	11.118	10.380	9.712	9.108	8.559	8.061	7.606
16	14.718	13.578	12.561	11.652	10.838	10.106	9.447	8.851	8.313	7.824
17	15.562	14.292	13.166	12.166	11.274	10.477	9.763	9.122	8.544	8.022
18	16.398	14.992	13.754	12.659	11.690	10.828	10.059	9.372	8.756	8.201
19	17.226	15.679	14.324	13.134	12.085	11.158	10.336	9.604	8.950	8.365
20	18.046	16.351	14.878	13.590	12.462	11.470	10.594	9.818	9.129	8.514

Periods (*n*)	Interest rates (*r*)									
	11%	12%	13%	14%	15%	16%	17%	18%	19%	20%
1	0.901	0.893	0.885	0.877	0.870	0.862	0.855	0.847	0.840	0.833
2	1.713	1.690	1.668	1.647	1.626	1.605	1.585	1.566	1.547	1.528
3	2.444	2.402	2.361	2.322	2.283	2.246	2.210	2.174	2.140	2.106
4	3.102	3.037	2.974	2.914	2.855	2.798	2.743	2.690	2.639	2.589
5	3.696	3.605	3.517	3.433	3.352	3.274	3.199	3.127	3.058	2.991
6	4.231	4.111	3.998	3.889	3.784	3.685	3.589	3.498	3.410	3.326
7	4.712	4.564	4.423	4.288	4.160	4.039	3.922	3.812	3.706	3.605
8	5.146	4.968	4.799	4.639	4.487	4.344	4.207	4.078	3.954	3.837
9	5.537	5.328	5.132	4.946	4.772	4.607	4.451	4.303	4.163	4.031
10	5.889	5.650	5.426	5.216	5.019	4.833	4.659	4.494	4.339	4.192
11	6.207	5.938	5.687	5.453	5.234	5.029	4.836	4.656	4.486	4.327
12	6.492	6.194	5.918	5.660	5.421	5.197	4.988	7.793	4.611	4.439
13	6.750	6.424	6.122	5.842	5.583	5.342	5.118	4.910	4.715	4.533
14	6.982	6.628	6.302	6.002	5.724	5.468	5.229	5.008	4.802	4.611
15	7.191	6.811	6.462	6.142	5.847	5.575	5.324	5.092	4.876	4.675
16	7.379	6.974	6.604	6.265	5.954	5.668	5.405	5.162	4.938	4.730
17	7.549	7.120	6.729	6.373	6.047	5.749	5.475	5.222	4.990	4.775
18	7.702	7.250	6.840	6.467	6.128	5.818	5.534	5.273	5.033	4.812
19	7.839	7.366	6.938	6.550	6.198	5.877	5.584	5.316	5.070	4.843
20	7.963	7.469	7.025	6.623	6.259	5.929	5.628	5.353	5.101	4.870

Formulae

Annuity
Present value of an annuity of £1 per annum receivable or payable for *n* years, commencing in one year, discounted at *r*% per annum:

$$PV = \frac{1}{r}\left[1 - \frac{1}{[1+r]^n}\right]$$

Perpetuity
Present value of £1 per annum, payable or receivable in perpetuity, commencing in one year, discounted at *r*% per annum:

$$PV = \frac{1}{r}$$

Growing Perpetuity
Present value of £1 per annum, receivable or payable, commencing in one year, growing in perpetuity at a constant rate of *g*% per annum, discounted at *r*% per annum:

$$PV = \frac{1}{r-g}$$

LIST OF VERBS USED IN THE QUESTION REQUIREMENTS

A list of the learning objectives and verbs that appear in the syllabus and in the question requirements for each question in this paper.

It is important that you answer the question according to the definition of the verb.

LEARNING OBJECTIVE	VERBS USED	DEFINITION
Level 1 - KNOWLEDGE		
What you are expected to know.	List	Make a list of
	State	Express, fully or clearly, the details/facts of
	Define	Give the exact meaning of
Level 2 - COMPREHENSION		
What you are expected to understand.	Describe	Communicate the key features
	Distinguish	Highlight the differences between
	Explain	Make clear or intelligible/State the meaning or purpose of
	Identify	Recognise, establish or select after consideration
	Illustrate	Use an example to describe or explain something
Level 3 - APPLICATION		
How you are expected to apply your knowledge.	Apply	Put to practical use
	Calculate/compute	Ascertain or reckon mathematically
	Demonstrate	Prove with certainty or to exhibit by practical means
	Prepare	Make or get ready for use
	Reconcile	Make or prove consistent/compatible
	Solve	Find an answer to
	Tabulate	Arrange in a table
Level 4 - ANALYSIS		
How are you expected to analyse the detail of what you have learned.	Analyse	Examine in detail the structure of
	Categorise	Place into a defined class or division
	Compare and contrast	Show the similarities and/or differences between
	Construct	Build up or compile
	Discuss	Examine in detail by argument
	Interpret	Translate into intelligible or familiar terms
	Prioritise	Place in order of priority or sequence for action
	Produce	Create or bring into existence
Level 5 - EVALUATION		
How are you expected to use your learning to evaluate, make decisions or recommendations.	Advise	Counsel, inform or notify
	Evaluate	Appraise or assess the value of
	Recommend	Advise on a course of action

Performance Pillar

Strategic Level Paper

P3 – Performance Strategy

May 2012

Wednesday Morning Session