Financial Management
Module 14
November 2010

Suggested Solutions

Section A
Question 1 Part a)
3 marks for answer in report format, 9 marks for NPV of investments and 3 marks for interpretation of results = 15 marks in total.

Report to Peartek Plc.,
Your answer should be in a report format, properly addressed, dated and structured.
Irrespective of how the projects are financed they should be discounted as per the company policy, i.e. all projects lasting ten years duration or less at a cost of capital of 10% and all other projects at a cost of 13%.
The following NPV calculations should be included in the body or the main findings in the body with the following in the appendices:

INVESTMENT A

Year	Sales #'s	Price Per unit	Sales €	Costs Per unit	Variable Costs	Contrib-ution	Fixed Costs	Profit
0								
1	10,000	10	€100,000	€6.00	€60,000	€40,000	€11,000	€29,000
2	9,000	8	€72,000	€4.50	€40,500	€31,500	€11,000	€20,500
3	8,100	6.4	€51,840	€3.38	€27,338	€24,503	€11,000	€13,503

Year	Equipment	Working Capital	Profit	Net Cash Flow	r = 10%	Present Value
0	-€40,000	-€20,000		-€60,000	1	-€60,000
1			€29,000	€29,000	0.909	€26,361
2			€20,500	€20,500	0.826	€16,933
3		€20,000	€13,503	€33,503	0.751	€25,160
4	€10,000			€10,000	0.683	€6,830
						€15,284

INVESTMENT B

r = 13%
g = 3%
Costs = €90,000
Yr 1 = €12,000
NPV = PV Benefits - PV of Costs =
PV Benefits = CF1 / (r - g) = 12,000 / (0.13 - 0.03) = €120,000
NPV = €120,000 - €90,000= €30,000

INVESTMENT C

NPV = PV Benefits - PV of Costs =

PV of €7,000 per annum in perpetuity = CFt / r = 7,000 / 0.13 = €53,846.15

less PV of €7,000 a year for years 1 to 7 x Discount Factor = €7,000 x 4.423 = €30,958.27

Thus PV of €7,000 a year from year 8 in perpetuity= €53,846.15 - €30,958.27 = €22,887.8

The discount factor for years 1 to 7 when r = 13% is 4.423

Less the discount factor for years 1 to 4 when r = 13% is 2.974

Thus the discount factor for years 5 to 7 when r = 13% is 4.423 - 2.974 = 1.448

Year	Net Cash Flow	Discount Factor	Present Value
0	-€25,000	1	-€25,000
1 to 4	€3,000	2.974	€8,922
5 to 7	€5,000	1.448	€7,240
8 +	€7,000		€22,888
		NPV =	€14,050

As all projects have positive NPV's they should all be undertaken. On the basis of the NPV criteria project B has the greatest positive net present value, followed by A then C and all should be undertaken.

Since the NPV values depend crucially on the discount rate used, students should outline to the board of Peartek Plc. the appropriateness of their choice of discount rates.

Students should also outline limitations associated with using the NPV method and ways to deal with these limitations. Limitations include how risky are the predicated cash flows and hence what is the appropriate cost of capital. Appropriate methods to deal with these include probability analysis and sensitivity analysis.

Question 1 Part b)
3 marks for calculations and 2 marks for comments = 5 marks in total.

From the calculations below, the IRR of Investment A is approximately 23% while the IRR of Investment B is approximately 18.5%. Thus both meet the required return of projects as given by the board of Peartek Plc. i.e. 10% for all projects lasting ten years duration or less and 13% for all other projects.

INVESTMENT A

Year	Equipment	Working Capital	Profit	Net Cash Flow	r = 10%	Present Value	r = 25%	Present Value
0	-€40,000	-€20,000		-€60,000	1	-€60,000	1	-€60,000
1			€29,000	€29,000	0.909	€26,361	0.8	€23,200
2			€20,500	€20,500	0.826	€16,933	0.64	€13,120
3		€20,000	€13,503	€33,503	0.751	€25,160	0.512	€17,153
4	€10,000			€10,000	0.683	€6,830	0.41	€4,100
						€15,284		-€2,427

IRR = A + {(a / (a – b)) * B – A)}

i.e. at r = 10%, NPV = €15,284.38

i.e. at r = 25%, NPV = €-2,426.72

IRR =   10% + {(15,284.38 / (15,284.38 - -2,426.72) * (25% - 10%)}

          10% + {(15,284.38 / (17,711.10) * (15%)}

          10% + {(0.863) * (15%)}

          10% + {0.13}

               22.94% approximately

INVESTMENT B

r =   13%

g =   3%

Costs =   €90,000

Yr 1 =   €12,000

NPV = PV Benefits - PV of Costs =

PV Benefits = CF1 / (r - g) = 12000 / (0.13 - 0.03) = €120000

     NPV = €120000 - 90000 = €30,000

r =   25%

g =   3%

Costs =   €90,000

Yr 1 =   €12,000

NPV = PV Benefits - PV of Costs =

PV Benefits = CF1 / (r - g) = 12,000 / (0.25 - 0.03) = €54,545.45

  NPV = €54,545.45 - 90,000.00 = -35,454.55

i.e. at r = 13%, NPV = €30,000.00

i.e. at r = 25%, NPV = €-35,454.55

IRR =   13% + {(30,000 / (30,000 - -35,454.55) * (25% - 13%)}

          13% + {(30,000 / (65,454.55) * (12%)}

          13% + {(0.458) * (12%)}

          13% + {5.50%}

          18.50%   approximately

Question 1 Part c)
3 marks for comments on appropriate discount rate and 2 marks for application to question = 5 marks in total.

Only firms with no debt in their capital structure should use the cost of equity to discount project cash flows, and only those projects that are very similar to a firm's existing assets should be discounted using that rate. Firms with both debt and equity should use the WACC as long as they are evaluating a project that is similar to their existing assets. When a firm is making an investment that is very different from its existing investments, then it should not use the company's cost of equity or its WACC.

The cost of debt or the cost of retained profit is never appropriate for use a discount rate.

In part (a) we calculated the NPV using a discount rate as per the company policy, i.e. all projects lasting ten years duration or less at a cost of capital of 10% and all other projects at a cost of 13%. Investment A is similar to their current investments and only requires an investment of €60,000 now. Therefore the WACC would be appropriate as a discount rate when appraising this new marginal investment opportunity.

Investment B is a long–term project and involves only an immediate outlay of €90,000. However as it is in a totally new area and the board is making an investment that is very different from its existing investments, the WACC would not be appropriate. Although they intend to borrow from their lenders at 6% this is not the appropriate cost of capital either. One must look at both the opportunity cost of funds and the risk of the project to decide the appropriate cost of capital for this project.

Question 2 Part a)
1 mark for initial calculations, 2 marks for each lodgement choice and 1 mark for recommendation = 10 marks in all.

Daily sales = Weekly sales / 5 = €100,000 / 5 = €20,000

Each day's lost interest costs (12% / 364) x €20,000 = €6.59

Days interest lost due to alternative lodging strategy

		Mon & Thurs	Thurs Only	Tues & Friday	Daily
1	Monday €20,000	0	3	1	0
2	Tuesday €20,000	2	2	0	0
3	Wednesday €20,000	1	1	2	0
4	Thursday €20,000	0	0	1	0
5	Friday €20,000	2	6	0	0
6	Saturday no lodgement				
7	Sunday no lodgement				
	Total No of days lost interest =	5	12	4	0
	# of Lodgements =	2	1	2	5
	Annual cost in interest *=	€1,714.29	€4,103.01	€1,367.67	€0
	Annual lodging costs **=	€1,040.00	€520.00	€1,040.00	€2,600
	Total annual cost =	**€2,754.29**	**€4,623.01**	**€2,407.67**	**€2,600**

Summary

Based solely on costs the best choice is option 3, which is to lodge on Tuesday and Friday.

The total annual cost will be €2,407.67

*= Cost per day x 5 x 52

**= No of Lodgements per week x €10 x 52

Question 2 Part b)
5 marks each for sections (i) and (ii) = 10 marks in all.

bi) **Only avail of the collection service, average collection period falls to 4 weeks.**

Currrent annual average dedbtors =
= *(Current collection period / days in year) x Annual sales*
= *(10 weeks / 364) x €5,200,000* =   €1,000,000

New annual average dedbtors
= *(New collection period / days in year) x Annual sales*
= (4 weeks / 364) x €5,200,000 =   €400,000
Reduction in annual average debtors =   **€600,000**

Factoring Charge (1.75% of Annual sales)   €91,000
less Expenses saved   -€35,000
Net Charge   **€56,000**

Cost as a % of funds advanced   €56,000 = 0.0933 **= 9.33%**
                                       €600,000

bii) **The average collection period falls to 4 weeks and Orycultures use the finance facilities.**

Funds advanced
= (New collection period / days in year) x Annual sales
= (4 weeks / 364) x €5,200,000 = €400,000
% Advanced   80%
Gross funds advanced   €320,000
Less
Commission of 2%   -€6,400
Interest on amount advanced   -€1,231
                              -€7,631
Plus reduction in annual average debtors =   €600,000
Net funds advanced   €912,369

Annual costs
Service charge (from (bi) above)   €56,000
Annual Commission   €84,124
= *Commission of 2% x (364/28)*
Annual Interest   €16,000
= *Interest on amount advanced x (364/28)*
Total net annual factoring costs =   €156,124

Cost as a % of funds advanced =   €156,124 = 0.1711 **= 17.11%**
                                         €912,369

Question 2 Part c)
3 marks for debt factoring, 2 marks for appropriateness of using services = 5 marks in all.

Debt factoring is a part of working capital management. It is a financial service in which a company obtains a cash advance using their debtors as security. The advance is usually provided by a specialist agency such a department within a bank or other third party factoring agency.

Companies tend to avail of the services of a debt factoring agency to obtain:
- the cash flow from the advance finance provided by the factor,
- the factor's expertise and organisation,
- more time to concentrate on the core activity of the business rather than on the administration of debtors.

The scope of working capital management services provided by the factor can vary from simple debt collection to the total management of sale receipts. Usually, the service provided involves the:
- administration of a client company's debtors,
- collection of its debts,
- elimination (or at least tighter control) of its bad debts, and the
- advancement of certain sums of cash on the basis of invoices issued to date.

Such services require the factor to have ready access to a level of liquidity which is only likely to be available to a major financial institution such as a bank. They must also possess economies of scale and have an ability to develop specialist expertise in this area. Factoring services are provided by most large banks in Ireland.

Factoring services have often had a negative perception among the customers of the companies that have obtained factoring agents to collect debts. This was due to the perception that the companies that have obtained factoring services may be in financial distress and / or the activities of the factoring agency in collection of debts. However, factoring services are not simply a means by a company to resolve financial distress. In reality factoring services are most likely only to be available to sound companies with a recognised trading record. Financial institutions would be averse to taking on the administration of the accounts of a potential client's particularly unfamiliar and difficult customers.

Factoring agencies may accept debts 'with' or 'without' recourse to the client company. The former means that if the debt cannot be recovered by the factor from the client's customer the client becomes responsible for the debt to the factor. Without recourse factoring means that the factor must bear the bad debt. For this reasons factors without recourse will typically retain a veto over both potential customers of the client and the credit terms the client can offer.

In return for these services a factor agency will typically charge a combination of:
- an administration fee,
- a percentage commission on the debts collected and
- interest on the advance finance supplied.

As Orycultures can borrow on overdraft at 12% p.a. while the collection service costs as a percentage of funds improvement 9.33% they should use the collection service of the factor.

However as the cost of finance advanced as a percentage of funds improvement is 17.11% it should not be used. This is typical, as usually the costs of funds advanced by a factor are more expensive than regular bank finance and would only be used where difficulties exist in raising regular bank finance.

Question 3
10 marks for workings and 8 marks for the report and 2 marks for recommendations = 20 marks in all.

Parts 1 to 4
By the nature of this question, answers should be in a report format. It should start off by being correctly directed to Mr Kyne as the Managing Director. A brief introduction should be followed by clearly structured sections dealing with each of the issues outlined in the question. If possible, an outline of its conclusions can be mentioned here. As with all reports a clear line of thinking should emerge, therefore if necessary, calculations and other supplementary material may be appended to the end of the report.

Since no information is given about market trends we may assume that current trends continue. Thus we will assume that 4,000 solar panels will be required per year in the future.

	Original System		Using EOQ		Using EOQ		JIT	
	Imported Pan's		Imported Pan's		Local Pan's		Imported Pan's	
S = Forecast annual usage		4,000		4,000		4,000		4,000
D= Ordering cost per order	€	6,000	€	6,000	€	2,000		N.A.
I = Annual inventory holding charge as a proportion of V		10%		10%		10%		N.A.
V = Cost per unit in stock	€	300.00	€	300.00	€	303.00	€	306.00
Q* = EOQ = ({2 x S x D} / {I x V})^0.5		1,000		1,265		727		N.A.
Number of deliveries per year		4.00		3.16		5.50		N.A.

Annual Ordering Costs = SD/ Q	€	24,000	€	18,974	€	11,009		N.A.
Annual Holding costs = IVQ/2	€	15,000	€	18,974	€	11,009		N.A.
Additional wholesale price cost	€	-	€	-	€	12,000		24,000
Total Cost	€	39,000	€	37,947	€	34,018	€	24,000
Reduction in costs due to change			€	1,053	€	4,982	€	15,000
Inventory costs per unit	€	9.75	€	9.49	€	8.50	€	6.00

From the table above we can see that using the current system, combining ordering costs and holding costs at €39,000, this is the highest cost alternative. If we are to continue with the current supplier and current system then we should decrease the orders from 4 to 3.16 (on average) per year with a consequent increase in order size from 1,000 per quarter to 1, 265 every four months approximately. This will cut ordering costs from €24,000 to €18,974 enough to compensate for the increase in holding costs from €15,000 to €18,974. Thus total costs ordering and holding costs will fall from €39,000 to €37,947, a saving of €1,053 per year.

However even greater savings could be made by switching to the local supplier. We could increase the orders from 4 to 5.5 (on average) per year with a consequent reduction in order size from 1,000 per quarter to 727 every two months approximately. This will cut total costs of ordering and holding inventories by €11,009. However to this we must add the additional wholesale price increase of 1%. The wholesale cost of these items to rise from €300 x 4,000 = €1,200,000 to €303 x 4,000 = €1,212,000, an increase of €12,000 per annum. This will reduce the total savings of switching to the local supplier to just €4,982.
Switching to the JIT system will add a 2% increase to the wholesale price, an additional €24,000 per annum. However as ordering and holding costs are eliminated, in total costs will fall from €39,000 originally to €24,000 a decrease of €15,000. This would be the biggest saving of all.

In describing some of the issues that might arise in the operation of an inventory control system note should be taken of the following;
1. Arguments for and against adopting EOQ over the current system
2. Arguments for and against using the new local supplier over the current supplier

3. Arguments for and against adopting EOQ over JIT system involving outsourcing

1. Arguments for adopting EOQ over the current system could include:
- Demand for solar panels is assumed known and predictable
- Quantity ordered shows little seasonal variation over time
- While inventory holding costs are increased in the new situation than in the current, reduction in inventory ordering costs is significant by comparison.

Arguments against could include:
- Past assumptions may not hold in the future, demand may change both in quantity and variability.
- Not all possible relevant information is given in the question, other variables not mentioned could impact
- As the average number of solar panels in stock is considerably reduced, there is a higher likelihood of a shortage or stock out
- No mention is made of the effects of a shortage or stock out or the need to maintain a safety stock

2. Arguments for using the new local supplier over the current supplier:
- Reduction in delivery time from two weeks to one should reduce the likelihood of a shortage or stock out
- As demand for solar panels is assumed known and predictable, less inventories in stock is acceptable
- Cost savings compared to current supplier using EOQ or current system

Arguments against could include:
- No information on track record of (un)reliability
- No information on guarantees or quality
- No cost savings compared to current supplier using JIT

3. Arguments for adopting EOQ over JIT system involving outsourcing could include:
(Note: some of the arguments against adopting an EOQ system and could apply even more forcefully apply against a JIT system, particularly the possibility of a shortage / stock out.)
- Outsourcing involves a reduction in ownership and control
- Morale may suffer as staff may feel that their jobs or prospects are under threat
- Using JIT they would have to rely upon quick response and delivery from their overseas supplier
- Using JIT they would probably be dependent upon on-line or equivalent ordering systems that are vulnerable to attack and breakdown
- No information on back up arrangements that would need to be made in the event of being let down by current suppliers
- No cost benefit by comparison to local supplier

Arguments against adopting EOQ over JIT system involving outsourcing could include:
- Outsourcing carries many benefits as well as risks, particularly but not exclusively costs
- Outsourcing is increasing in both size and scope
- May be used for activities regarded as ancillary to the core activities of the firm
- If we wish to stick with the current supplier, JIT is the lower cost option
- Supplies ordered in as they were needed
- The JIT system as outlined here potentially frees up management and staff time from stock control duties.

Part 5
In reaching conclusions and making recommendations candidates would be expected to take account of the fact that inventory control is an important part of the financial planning and control system. Inventories are often controlled by a variety of departments; each with their own interests in maintaining stocks at a high level. It often falls to the financial management department to ensure that conflicting interests are kept in balance. The goal of financial management in this context is that the investment in total inventory yields the largest possible NPV. Optimum inventory control is however compromised by many real world factors which hinder its achievement.

Section B

Question 4 Part a)
1 mark for explaining non-financial objectives and 1.5 marks for each objective, max 4 = 7 marks in total.

The maximisation of long term shareholder wealth should be the objective of all profit seeking private companies. Often companies try to achieve this through a series of primary financial objectives. In addition to these primary financial targets even profit seeking private companies often have other secondary non-financial targets.

Non-financial objectives could be aimed at:
  i)   The welfare of employees. Examples of this could be health and safety in the work place, social and recreational services, the provision of accommodation or other services and pay and perquisites beyond what might be deemed necessary to attract and hold the appropriate staff.

  ii) The welfare of management. Examples of this could be excessive pay and perquisites, "empire building" or increasing market share by either organic growth or through mergers and acquisition beyond what is in the best interests of shareholders for the benefit of management or not taking on risks that would be in the interests of shareholders but could jeopardise the survival of the firm and hence the welfare of the management.

  iii) The welfare of society. Examples of this could be acting in an environmentally sustainable way, not testing products on animals, respecting human rights, being a "good neighbour" and contributing to the local economy / community.

  iv) The provision of a service. Examples of this could be providing a service which could not be justified on purely profit grounds such as assisting access to their products for the disabled or those in remote areas.

  v)   The fulfilment of responsibilities towards customers and suppliers. Examples of this could be excellent customer service or only dealing with "Fair Trade" suppliers.

  vi) Technology / quality improvements. Many technology and engineering companies are said to spend more time and effort on improving the technical aspects of their product or service than in maximising their commercial value.

Question 4 Part b)
2 marks for discussion and 1.5 marks for example explaining effects for each objective, max 4 = 8 marks in total.

While the maximisation of long term shareholder wealth should be the objective of all profit seeking private companies it may have to be compromised in order to satisfy other non-financial objectives. It is now common to see firms producing social and environmental accounting reports, as well as Corporate Social Responsibility reports and advertisements. Primary financial objectives can include profit and dividend growth, (usually expressed as earnings per share and dividends per share). In addition to these are the secondary financial targets such as the level of debt, the level of interest, profit retention, operating profitability etc. Finally there are the non financial targets as outlined above.

It is often argued that many of these other (contradictory) objectives make it impossible to achieve the primary financial objectives, especially in the short term. Hence it is not a case of maximising or minimising objectives, compromises must be made between competing objectives. However it is also argued that by addressing these issues a company can succeed in the long term.

The effect of non-financial objectives on the achievement of the financial objectives of companies can include:
- By trying to improve health and safety in the work place, social and recreational services, the provision of accommodation or other services and pay and perquisites beyond what might be deemed necessary to attract and hold the appropriate staff will increase costs and hence could reduce profit and dividend growth. However the contrary is not always advisable either. Not following acceptable health and safety standards or paying below minimum acceptable or legal standards either in the customers markets or even where the product / service is sourced in for example a third world country can be advantageous in the short term. However it is possible that this could lead to de-motivated employees and angry customers. If the company's reputation suffers attracting and keeping customers will be more difficult. Thus in the longer term this could hinder achieving the financial objectives of companies.

- It would be hard to imagine how excessive pay and perquisites could be in the best interests of shareholders. Thus this would be expected to reduce profit and dividend growth. Similarly while management might argue that increasing market share or increasing the size of the company by either organic growth or through mergers and acquisition might be good for the shareholders this is often not the case, (as often witnessed by the fall in the share price of a predator firm when it announces it intends to engage in the takeover of another firm). This can lead to earnings per share and dividends per share falls even though total profit and dividends may rise.

- Not taking on risks would be expected to reduce profit and dividend growth and would not be in the interests of shareholders unless it was argued that financial distress costs are higher than is usually estimated in finance theory.

- Most firms now accept that they everyone has a part to play in ensuring sustainable development and reducing their impact on the environment. Also many firms choose to help society in many other ways too such as contributing to the local economy / community not engaging in illegal activities such as illegal pollution or bribing local and national officials. This could increase costs, particularly in the short term. Hence it could reduce profit and dividend growth. However it is possible that this could lead to increasing the reputation of the company. This could lead to better motivated employees and again attracting and keeping customers could be easier. Thus in the longer term this could be good for the achieving the financial objectives of companies.

- Often firm provide a service such as assisting access to their products for the disabled or those in remote areas. In many cases this is done purely to fulfil statutory obligations but often it is done for "humanitarian" reasons too. This would be expected to reduce profit and dividend growth. While in the short term getting around these regulations might appear to be a good idea, should this be exposed, this legal but "unethical" behaviour might do irreversible damage to a company's

reputation. Hence providing such services could be interest of achieving the financial objectives of companies.

- Offering excellent customer service or only dealing with "Fair Trade" suppliers and other form of "ethical behaviour" can increase costs and hence could reduce profit and dividend growth. However a reputation for always acting ethically could also lead to better motivated employees. And if the company's reputation improves, attracting and keeping customers will be easier. Thus in the longer term this could be good for the achieving the financial objectives of companies.

- Perhaps some technology and engineering companies might be spending more time and effort on improving the technical aspects of their product or develop new technologies that will improve the environment rather than spending time in maximising shareholder wealth. However once again it is possible that this could also lead to better motivated employees. And if the company's reputation improves, attracting and keeping customers will be easier. Thus in the longer term this could be good for the achieving the financial objectives of companies.

Question 5 Part a)
3 marks for explaining benefits of diversification 3 marks for explaining limits and 3 marks for for diagram = 9 marks in all.
The total risk of individual risky assets is captured in standard deviation. The standard deviation or the total risk can be broken down into two forms, namely: unsystematic risk and systematic risk. Unsystematic risk is risk that is specific to a single investment. The unsystematic risk is unique to the firm but is diversifiable. Hence it is also called diversifiable risk or unique risk. It comes from the fact that many of the perils that surround an individual company are peculiar to that company and perhaps its immediate competitors.

With diversification, when we combine assets in a portfolio, the unique or unsystematic risks cancel out, leaving only the systematic or market risk. The systematic or market risk element can never be diversified away which is why it is also called undiversifiable risk. Such risk can be casually observed from stock market indices e.g. the ISEQ or the FTSE index has gone up or down in value over a certain period of time. Systematic or market risk is that which stems from the fact that business activity tends to be cyclical. This systematic risk in all risky security is incorporated into the beta term of that security in the Capital Asset Pricing Model.

As an investor adds more stocks to their portfolio, the unique or unsystematic risks of the individual stocks begin to cancel out. The portfolio's standard deviation declines. This effect is quite pronounced when diversification begins (i.e., when we have two stocks rather than one or three stocks rather than two). However the rate of decrease in risk begins to level off as more and more of the unique risk is diversified away. The incremental diversification benefit becomes very small. Eventually as more assets are added to the portfolio all that would be left would be systematic or market risk which is undiversifiable. In the diagram below we see that with around 20 stocks we can obtain a portfolio that has a standard deviation almost as low as the standard deviation of the market portfolio. A "market portfolio" is a weighted average portfolio that would be made up of all shares in proportion to their total market value.
If we wish to completely avoid risk we must invest in "risk free" assets such as short term government paper.
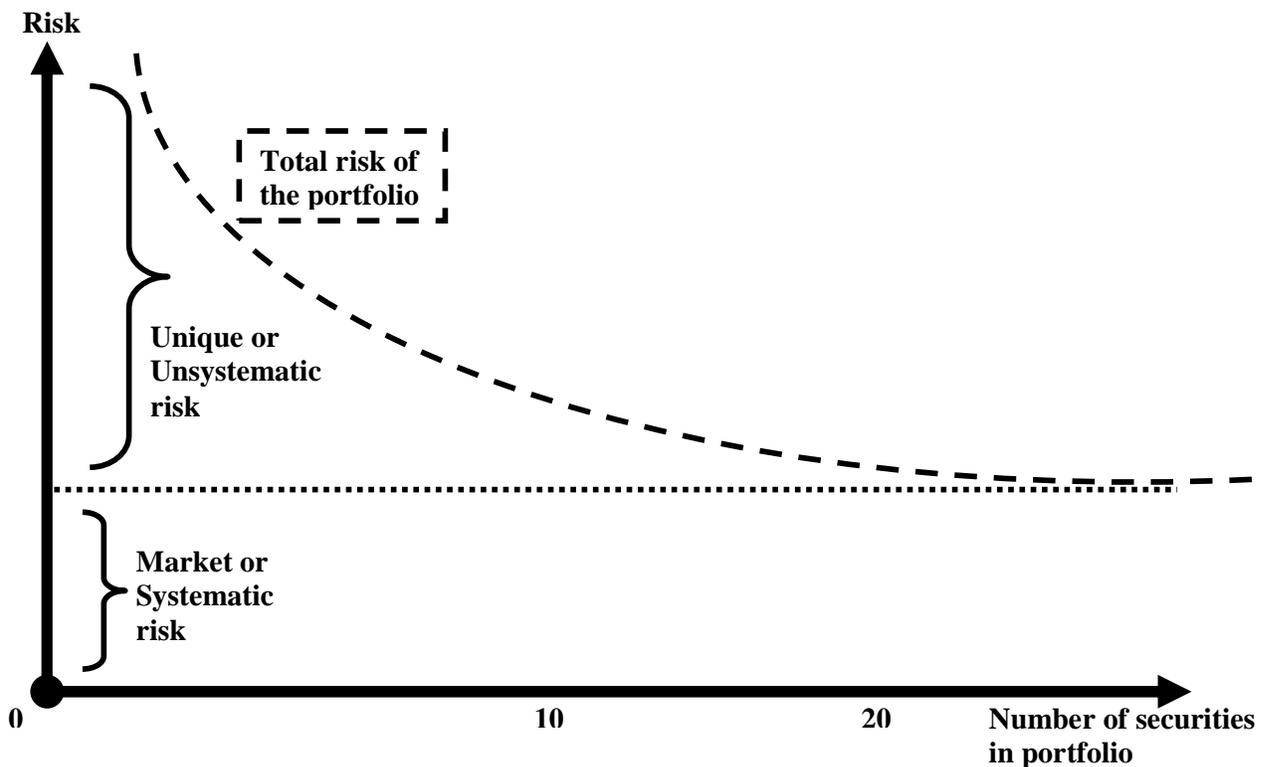
Question 5 Part b)
2 marks for standard deviation, 2 marks for Beta and 2 marks for appropriate measure = 6 marks in all.

While it is possible for investors to avoid risk by only investing in risk free investments e.g. short term Government paper the expected returns will be low. Generally it is accepted that investors need a higher reward to take on higher levels of risk. Similarly, investors accept that the higher the return they can expect, the higher the level of risk they will have to bear, and vice versa. So it is important that we know what is meant by risk and how we measure it.

Standard deviation, or total risk, is the square root of the weighted average deviation of the returns on the individual stocks in a portfolio from the mean return, E.g. for a two asset portfolio, the Standard Deviation (= "the total risk of the portfolio") $= \sigma_P = \sqrt{x_1^2\sigma_1^2 + x_2^2\sigma_2^2 + 2\,x_1 x_2\,\rho_{12}}$

The standard deviation or total risk of so called 'risky investments' can be broken down into two forms, namely: unsystematic risk which is diversable and systematic risk which is undiversifiable.

For an investor with an undiversified portfolio, it is total risk or standard deviation which is the most appropriate measure of risk.

The risk-return relationship an investor will be willing to accept will be a personal decision, influenced to a great extent by their attitude to risk i.e. their degree of risk aversion. While total risk is composed of unique risk and market risk, the market only compensates for market risk. There is no return for taking on unique risk that is diversifiable.

The systematic risk remaining in a portfolio reveals how that portfolio responds to changes in the value of the market portfolio. Some shares will be more cyclical and hence more responsive to changes in the value of the market portfolio. These are considered inherently more risky than other portfolios. Any investor wishing to invest in such shares must accept the associated level of risk which is undiversifiable.

The systematic risk of a security is incorporated into the beta term of the capital asset pricing model. Beta is the slope of a regression line, and it equals the covariance of the return on a security with the return on the market divided by the variance of the market return

Beta measures the sensitivity of a stock's return to the return on the market portfolio. The market portfolio is a portfolio of all assets in the economy. In practice a broad stock market index, such as the S&P Composite, is used to represent the market. By definition the Beta of the market portfolio is one and that of the risk free asset is zero. While beta does not directly measure risk, it is a crucial risk indicator, reflecting the extent to which the returns on the single asset move with the market.

CAPM states that $E(r_i) = r_f + \{E(r_m).- r_f\}.\beta i$

Unlike standard deviation, Beta is not a measure of total risk but a measure of relative risk, the risk of an asset relative to the market. Beta is also a measure of market risk. Market risk accounts for most of the risk of a well-diversified portfolio.

For an investor with a diversified portfolio, it is the beta not the standard deviation of the portfolio which is the most appropriate measure of risk.

Question 6 Part a)
A bond selling at a premium is a good investment.
3 marks for explaining a bond selling at a premium, 2 marks for if a good investment = 5 marks in total.

A bond is a debt security. Depending on the terms of the bond, the issuer owes the holders a debt and, is obliged to pay interest (the coupon) and/or to repay the principal at maturity. Before deciding the interest rate that the issuer of a bond must pay there are many factors that must be considered. For example how much are similar bonds paying, what is the benchmark current rate of interest, what is the length of the term of the bond, what is the creditworthiness of the issuer perceived as etc.

As mentioned there are many factors that influence a bonds value. However bond values, as with most fixed-income securities, are highly correlated with interest rates. As interest rates rise, a bond's market price will fall and vice versa. When referring to a fixed rate bond, the terms premium and discount are often used. This means that the bond is selling for more than (a premium) or less than (a discount) its original price or par value. For example, if a bond with a par value of €1,000 is selling for more than €1,000 then it is being sold at a premium. If less than €1,000 then it is selling at a discount.

This can occur due to changing market interest rates. For example, assume the market interest rate is 5% today and a bond with a face value of €1,000 is paying an 8% coupon. If interest rates go down to 4% from the time of its issue, it becomes more desirable than newly issued bonds paying a new lower coupon reflecting the new lower rate of interest. The bond should sell for more than the par value to reflect this increased demand. This is because the bond is now paying a 4% spread over the interest rate instead of the previous 3%.

Is it a good investment? Just because a bond is selling at a premium does not determine whether it is a good or bad investment. The many other factors already mentioned affect the future value of the bond, including the expectation of changes in interest rates and the credit worthiness of the issuer of the bond itself.

Question 6 Part b)
Describe the two basic types of leases available and explain the advantages and disadvantages of leasing.
1 mark for basic types, 2 x 2 marks for advantages and disadvantages, = 5 marks in total.

The two basic types of leases available to a business are operating leases and financial leases.

An operating lease is typically a contractual arrangement whereby the lessee agrees to make periodic payments to the lessor, often for five years or less, to obtain an asset's ser vices. The lessee generally receives an option to cancel the lease by paying a cancellation fee.

A financial (or capital) lease is longer term than an operating lease. Financial leases are non-cancellable and therefore obligate the lessee to make payments over a predefined period.

The advantages of leasing are
- the ability of the lessee to depreciate land, which is prohibited if the land were purchased,
- the use of sale-leaseback arrangements may permit the firm to increase its liquidity by converting an asset into cash, which can then be used as working capital,
- leasing provides 100 percent financing,
- the maximum claim of lessors if a lessee becomes bankrupt is three years of lease payments along with reclaiming the asset,
- the lessee may avoid the cost of obsolescence if the lessor fails to accurately anticipate the obsolescence of assets and sets the lease payment too low,
- the lessee avoids many of the restrictive covenants that are usually included as part of a long-term loan, and
- in the case of low-cost assets leasing may provide the firm with needed financing flexibility.

The disadvantages of leasing are
- a lease does not have a stated interest cost,
- at the end of the term of the lease agreement, the lessor realises the salvage value,
- the lessee is generally prohibited from making improvements on the leased property or asset without the approval of the lessor, and
- if a lessee leases an asset that subsequently becomes obsolete, it still must make lease payments over the remaining term of the lease.

Question 6 Part c)
Why the combining of the roles of the Chairman and the Chief Executive is considered undesirable.
1 mark for role of the Chairman, 1 mark for role of the CEO and 3 mark for why it's inappropriate to combine roles = 5 marks in all.

The role of the Chairman is to act as the leader of the board of directors and to be responsible for the successful carrying out of the policies set by the board. The Chairman has the most important role in external relations with all the stakeholders and investors in the company.

As a direct employee of the company, the Chief Executive Officer (CEO) is the highest ranking executive director. The CEO is therefore personally accountable to the board for both all decisions made by all the executive management and the results of those decisions.

Thus these two positions are the most dominant on the board of directors. Should these two positions be held by the same person then that person could have such a powerful influence on decision-making that other board members would not feel comfortable to confront or call to account such a strong director. Likewise it may also be easier said than done for all aspects of an issue to be well thought-out before decisions are made.

Should the dominant director also play a key role in selecting non-executive directors, these NEDs may feel compromised in vigorously offering the challenge needed for long-term success. It would not be unreasonable to suspect that maximising shareholder value might be sacrificed and that they might manage the company for their own personal benefit rather than in the interests of all shareholders. Many examples of poor corporate governance that led to the setting up of the Cadbury Committee were in companies run by domineering chairmen and chief executives, such as Asil Nadir (Polly Peck) and Robert Maxwell (Mirror Group).

Reasons given by listed companies for defying the code include that given by Morrisons in the UK, that basically no one understood the supermarket business better their CEO who they also made chairman. While that was somewhat acceptable while the group was performing strongly once the results began to slip this blatant breach of the Combined Code was no longer deemed acceptable and the company followed the code and separated out the roles of CEO and Chairman to two different people.

Question 6 Part d)
The relationship between working capital and profitability.
1 mark for explanation of Working capital, 4 marks for relationship = 5 marks in all.

It is very possible if not probable that as working capital in a firm increase so does profit. This is because the level of working capital: stocks, debtors and creditors should follow the level of business which in turn should be generating profits. As a business expands in terms of fixed assets it will usually require additional working capital too. Also as profit increases it allows working capital to be increased too.

However it is not working capital per se that generates profits or profits that generates working capital. What is important is how and in what proportions working capital is used. A company needs to exercise control over working capital. Particularly when credit markets are tight, a company's liquidity is as important as its profitability. Changes in working capital will usually change a company's liquidity.

Depending on the nature of a business, its working capital requirements will be different. Unlike a typical service company, a manufacturing company may need substantial levels of stocks. It may also have high levels of debtors and creditors as well. However a decision to use "Just In Time" methods of production, if implemented successfully, could result in lower levels of stocks. Also producing in smaller batches could result in the reduction of finished goods.

Therefore it is not necessary to have higher working capital to have higher profits. In fact in companies with loose financial management that carry high stocks and are too generous with giving credit while not taking advantage of credit available for them will not be as profitable as ones that are more tightly managed.

Question 6 Part e)
Overtrading, give three of its symptoms and explain how it can be resolved:
1 mark for explanation, 1 mark each for 3 symptoms, 1 mark for how it can be sorted = 5 marks in all.

Overtrading refers to a situation where turnover is increased without a matching increase in equity or other long-term sources of funds; as a result, a company which can be earning good profits can run into a liquidity crisis and default in payment of its current liabilities. The company is unable to finance the level of operations which it has achieved. Further business growth increases the pressure upon working capital. A major cause of overtrading is where a company considerably increases its sales by offering generous credit terms without obtaining any equivalent credit terms from its own creditors. The company may try to obtain further short term finance by borrowing or non payment of its own creditors which can quickly lead to considerable financial distress or even liquidation.

Companies experiencing overtrading might notice the following symptoms;
- The increased investment in current assets needed to support the increased sales are financed mainly from short-term sources like creditors and bank overdraft, resulting in a declining current ratio and quick ratio.
- Sales tend to increase very quickly in relation to equity, resulting in sharp increases in the ratio of sales to equity.
- The increase in debt would lead to higher gearing ratios.
- The net working capital will tend to decline, and may even become negative. A negative net working capital implies a current ratio less than unity (current assets less than current liabilities), and a business in such a position is likely to face considerable difficulty in meeting its current liabilities.

Even where the current ratio is satisfactory, any erosion of net working capital would worsen the liquidity of the business and make it more vulnerable to cyclical risk.

The instant solution to overtrading is to take more trade credit and bank overdraft finance. However this is likely to be only a short-term fix that ultimately exacerbates the situation and worsens the liquidity crisis.
Better short-term solutions would be to either restrict the growth in turnover to manageable proportions or improve working capital management so that the investment in current assets required to support the level of sales is reduced (i.e. better inventory control, credit policy and debt collection).
The long-term solution is to provide more long-term funds for working capital purposes - i.e. improve the Net Working Capital position of the firm.

Question 6 Part f)
Describe the main features of and explain what are the main attractions to the investor and to the issuer of convertible bonds.
1 mark for main features, 2 x 2 marks for advantages and disadvantages, = 5 marks in total.

Convertible bonds are fixed return securities that may be converted into ordinary shares of a company at pre-determined date(s) and at a pre-determined rate at the option of the holder. Often the terms of the conversion may seem to be less attractive at conversion dates further away. This reflects expected share price growth.

At the conversion date or dates, the holder has the option to convert the stock into ordinary shares or continue to hold the stock and earn the fixed interest until the bond matures. However, if the investor decides to convert the bond into ordinary shares, they cannot convert the ordinary shares back into the original fixed security. The conversion premium is the difference between the nominal issue value of the bonds and the conversion value at the date of issue. From the issuers viewpoint the larger the conversion premium the better as less shares need be issued for a given amount of capital raised. However to be acceptable and valuable to investors the premium must reflect the growth prospects of the issuers ordinary share price.

Attractions of convertible bonds to the investor:
- The price of the convertible bond in effect includes an option to buy the ordinary shares.
- The potential value of the conversion rights.
- Interest income which would not be received if the investor simply bought a call option on the shares.

Attractions of convertible bonds to the issuer:
- The interest cost to the company is lower than for conventional, non-convertible stock.
- Most issuers expect the bonds to be converted and hence view them as delayed equity.
- Thus EPS is not immediately affected as it would with the issue of ordinary shares.
- If bond is converted into equity then this removes the necessity to raise funds to redeem the initial loan stock