Answers

Section C

31 (a) (i) The cash operating cycle can be calculated by adding inventory days and receivables days, and subtracting payables days.

Cost of sales = 3,500,000 x (1 – 0·4) = $2,100,000

Inventory days = 360 x 455,000/2,100,000 = 78 days
Trade receivables days = 360 x 408,350/3,500,000 = 42 days
Trade payables days = 360 x 186,700/2,100,000 = 32 days

Cash operating cycle of Pangli Co = 78 + 42 – 32 = 88 days

(ii) Inventory at end of January 20X7 = 455,000 + 52,250 = $507,250

At the start of January 20X7, 100% of December 20X6 receivables will be outstanding ($300,000), together with 40% of November 20X6 receivables ($108,350 = 40% x 270,875), a total of $408,350 as given.

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Trade receivables at start of January 20X7	408,350
Outstanding November 20X6 receivables paid	(108,350)
December 20X6 receivables, 60% paid	(180,000)
January 20X7 credit sales	350,000
Trade receivables at end of January 20X7	470,000

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Trade payables at start of January 20X7	186,700
Payment of 70% of trade payables	(130,690)
January 20X7 credit purchases	250,000
Trade payables at end of January 20X7	306,010

Overdraft decrease due to working capital movements = 52,250 + 61,650 – 119,310 = ($5,410)

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Overdraft at start of January 20X7	240,250
Decrease from working capital movements	(5,410)
Interest payment	70,000
Operating cash outflows	146,500
Overdraft expected at end of January 20X7	451,340

(iii) Current assets at start of January 20X7 = 455,000 + 408,350 = $863,350
Current liabilities at start of January 20X7 = 186,700 + 240,250 = $426,950
Current ratio at start of January 20X7 = 863,350/426,950 = 2·03 times

Current assets at end of January 20X7 = 507,250 + 470,000 = $977,250
Current liabilities at end of January 20X7 = 306,010 + 451,340 = $757,350
Current ratio at end of January 20X7 = 977,250/757,350 = 1·29 times

(b) Pangli Co could use the following techniques in managing trade receivables: assessing creditworthiness; managing accounts receivable; collecting amounts owing; offering early settlement discounts; using factoring and invoice discounting; and managing foreign accounts receivable.

Assessing creditworthiness
Pangli Co can seek to reduce its exposure to the risks of bad debt and late payment by assessing the creditworthiness of new customers. In order to do this, the company needs to review information from a range of sources. These sources include trade references, bank references, credit reference agencies and published accounts. To help it to review this information, Pangli Co might develop its own credit scoring process. After assessing the creditworthiness of new customers, Pangli Co can decide on how much credit to offer and on what terms.

Managing accounts receivable
Pangli Co needs to make sure that its credit customers abide by the terms of trade agreed when credit was granted following credit assessment. The company wants its customers to settle their outstanding accounts on time and also to keep to their agreed credit limits. Key information here will be the number of overdue accounts and the degree of lateness of amounts outstanding. An aged receivables analysis can provide this information.

Pangli Co also needs to make sure that its credit customers are aware of the outstanding invoices on their accounts. The company will therefore remind them when payment is due and regularly send out statements of account.

Collecting amounts owing

Ideally, credit customers will pay on time and there will be no need to chase late payers. There are many ways to make payment in the modern business world and Pangli Co must make sure that its credit customers are able to pay quickly and easily. If an account becomes overdue, Pangli Co must make sure it is followed up quickly. Credit control staff must assess whether payment is likely to be forthcoming and if not, a clear policy must be in place on further steps to take. These further steps might include legal action and using the services of a debt collection agency.

Offering early settlement discounts

Pangli Co can encourage its credit customers to settle outstanding amounts by offering an early settlement discount. This will offer a reduction in the outstanding amount (the discount) in exchange for settlement before the due date. For example, if the credit customer agreed to pay in full after 40 days, an early settlement discount might offer a 2% discount for settling after 25 days. Pangli Co must weigh the benefit of offering such an early settlement discount against the benefit expected to arise from its use by credit customers. One possible benefit might be a reduction in the amount of interest the company pays on its overdraft. Another possible benefit might be matching or bettering the terms of trade of a competitor.

Using factoring and invoice discounting

Pangli Co might use a factor to help manage its accounts receivable, either on a recourse or non-recourse basis. The factor could offer assistance in credit assessment, managing accounts receivable and collecting amounts owing. For a fee, the factor could advance a percentage of the face value of outstanding invoices. The service offered by the factor would be tailored to the needs of the company.

Invoice discounting is a service whereby a third party, usually a factor, pays a percentage of the face value of a collection of high value invoices. When the invoices are settled, the outstanding balance is paid to the company, less the invoice discounter's fee.

Managing foreign accounts receivable

Foreign accounts receivable can engender increased risk of non-payment by customers and can increase the value of outstanding receivables due to the longer time over which foreign accounts receivable are outstanding. Pangli Co could reduce the risk of non-payment by assessing creditworthiness, employing an export factor, taking out export credit insurance, using documentary credits and entering into countertrade agreements. The company could reduce the amount of investment in foreign accounts receivable through using techniques such as advances against collections and negotiating or discounting bills of exchange

Examiner's note: Only five techniques were required to be discussed.

32 (a) The terms risk and uncertainty are often used interchangeably in everyday discussion, however, there is a clear difference between them in relation to investment appraisal.

Risk refers to the situation where an investment project has several possible outcomes, all of which are known and to which probabilities can be attached, for example, on the basis of past experience. Risk can therefore be quantified and measured by the variability of returns of an investment project.

Uncertainty refers to the situation where an investment project has several possible outcomes but it is not possible to assign probabilities to their occurrence. It is therefore not possible to say which outcomes are likely to occur.

The difference between risk and uncertainty, therefore, is that risk can be quantified whereas uncertainty cannot be quantified. Risk increases with the variability of returns, while uncertainty increases with project life.

(b) NPV calculation

Year	1	2	3	4	5
	$000	$000	$000	$000	$000
Sales income	12,069	16,791	23,947	11,936	
Variable cost	(5,491)	(7,139)	(9,720)	(5,616)	
Contribution	6,578	9,652	14,227	6,320	
Fixed cost	(1,100)	(1,121)	(1,155)	(1,200)	
Taxable cash flow	5,478	8,531	13,072	5,120	
Taxation at 28%		(1,534)	(2,389)	(3,660)	(1,434)
TAD tax benefits		1,400	1,050	788	2,362
After-tax cash flow	5,478	8,397	11,733	2,248	928
Discount at 10%	0·909	0·826	0·751	0·683	0·621
Present values	4,980	6,936	8,812	1,535	576

	$000
PV of future cash flows	22,839
Initial investment	(20,000)
ENPV	2,839

Comment

The probability that variable cost per unit will be $12·00 per unit or less is 80% and so the probability of a positive NPV is therefore at least 80%. However, the effect on the NPV of the variable cost per unit increasing to $14·70 per unit must be investigated, as this may result in a negative NPV.

The expected NPV is positive and so the investment project is likely to be acceptable on financial grounds.

Workings

Sales revenue

Year	1	2	3	4
Selling price ($/unit)	26·50	28·50	30·00	26·00
Inflated at 3·5% per year	27·43	30·53	33·26	29·84
Sales volume (000 units/year)	440	550	720	400
Sales income ($000/year)	12,069	16,791	23,947	11,936

Variable cost

Mean variable cost = (0·45 x 10·80) + (0·35 x 12·00) + (0·20 x 14·70) = $12·00/unit

Year	1	2	3	4
Variable cost ($/unit)	12·00	12·00	12·00	12·00
Inflated at 4% per year	12·48	12·98	13·50	14·04
Sales volume (000 units/year)	440	550	720	400
Variable cost ($000/year)	5,491	7,139	9,720	5,616

Year	1	2	3	4
TAD ($000)	5,000	3,750	2,813	8,437
Tax benefits at 28% ($000)	1,400	1,050	788	2,362*

*(20,000 x 0·28) – 1,400 – 1,050 – 788 = $2,362,000

Alternative calculation of after-tax cash flow

Year	1	2	3	4	5
	$000	$000	$000	$000	$000
Taxable cash flow	5,478	8,531	13,072	5,120	
TAD ($000)	(5,000)	(3,750)	(2,813)	(8,437)	
Taxable profit	478	4,781	10,259	(3,317)	
Taxation at 28%		(134)	(1,339)	(2,873)	929
After-tax profit	478	4,647	8,920	(6,190)	929
Add back TAD	5,000	3,750	2,813	8,437	
After-tax cash flow	5,478	8,397	11,733	2,247	929

(c) There are several ways of considering risk in the investment appraisal process.

Sensitivity analysis

This technique looks at the effect on the NPV of an investment project of changes in project variables, such as selling price per unit, variable cost per unit and sales volume. There are two approaches which are used. The first approach calculates the relative (percentage) change in a given project variable which is needed to make the NPV zero. The second approach calculates the relative (percentage) change in project NPV which results from a given change in the value of a project variable (for example, 5%).

Sensitivity analysis considers each project variable individually. Once the sensitivities for each project variable have been calculated, the next step is to identify the key or critical variables. These are the project variables where the smallest relative change makes the NPV zero, or where the biggest change in NPV results from a given change in the value of a project variable. The key or critical project variables indicate where underlying assumptions may need to be checked or where managers may need to focus their attention in order to make an investment project successful. However, as sensitivity analysis does not consider risk as measured by probabilities, it can be argued that it is not really a way of considering risk in investment appraisal at all, even though it is often described as such.

Probability analysis

This technique requires that probabilities for each project outcome be assessed and assigned. Alternatively, probabilities for different values of project variables can be assessed and assigned. A range of project NPVs can then be calculated, as well as the mean NPV (the expected NPV or ENPV) associated with repeating the investment project many times. The worst and best outcomes and their probabilities, the most likely outcome and its probability and the probability of a negative NPV can also be calculated. Investment decisions could then be based on the risk profile of the investment project, rather than simply on the NPV decision rule.

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Risk-adjusted discount rate

It is often said that 'the higher the risk, the higher the return'. Investment projects with higher risk should therefore be discounted with a higher discount rate than lower risk investment projects. Better still, the discount rate should reflect the risk of the investment project.

Theoretically, the capital asset pricing model (CAPM) can be used to determine a project-specific discount rate which reflects an investment project's systematic risk. This means selecting a proxy company with similar business activities to a proposed investment project, ungearing the proxy company equity beta to give an asset beta which does not reflect the proxy company financial risk, regearing the asset beta to give an equity beta which reflects the financial risk of the investing company, and using the CAPM to calculate a project-specific cost of equity for the investment project.

Adjusted payback

If uncertainty and risk are seen as being the same, payback can consider risk by shortening the payback period. Because uncertainty (risk) increases with project life, shortening the payback period will require a risky project to pay back sooner, thereby focusing on cash flows which are nearer in time (less uncertain) and so less risky.

Discounted payback can also be seen as considering risk because future cash flows can be converted into present values using a risk-adjusted discount rate. The target payback period normally used by a company can then be applied to the discounted cash flows. Overall, the effect is likely to be similar to shortening the payback period with undiscounted cash flows.

				Marks	*Marks*
Section C					
31	**(a)**	**(i)**	Cost of sales	0·5	
			Inventory days	0·5	
			Receivables days	0·5	
			Cash operating cycle	0·5	
					2
		(ii)	Inventory 31 January	0·5	
			Receivables 31 January	1	
			Payables 31 January	1	
			O/d increase from WC	0·5	
			Overdraft 31 January	1	
					4
		(iii)	Current ratio 1 January	2	
			Current ratio 31 January	2	
					4
	(b)		First technique	2	
			Second technique	2	
			Third technique	2	
			Fourth technique	2	
			Fifth technique	2	
					10
					20
32	**(a)**		Explain risk	1	
			Explain uncertainty	1	
			Discuss difference	1	
					3
	(b)		Inflated revenue	1	
			Mean variable cost	1	
			Inflated variable cost	1	
			Tax liabilities	1	
			TAD benefits	1	
			Timing of tax flows	1	
			Calculation of PVs	1	
			Comment on variable cost	1	
			Comment on NPV	1	
					9
	(c)		Sensitivity analysis	2	
			Probability analysis	2	
			Risk-adjusted rate	2	
			Adjusted payback	2	
					8
					20

F9 Examiner's commentary on March/June 2017sample questions

This commentary has been written to accompany the published sample questions and answers and is written based on the observations of markers. The aim is to provide constructive guidance for future candidates and their tutors, giving insight into what the marking team is looking for, and flagging pitfalls encountered by candidates who sat these questions.

Question 31(a)(i)

Here, candidates were asked to calculate the cash operating cycle of a company. Even though candidates tend usually to perform well on calculation-based questions, a significant number of candidates struggled here. The cash operating cycle is the sum of inventory days and accounts receivable days, less accounts payable days, i.e. it is measured as a period of time. A number of candidates confused the cash operating cycle with net working capital, i.e. they calculated inventory plus accounts receivable less accounts payable, which is a monetary value. These answers indicated some candidates were not aware that the cash operating cycle is produced from three working capital ratios.

Other errors seen here included:

- basing working capital ratios on monthly credit sales instead of annual credit sales
- using end-of-month figures instead of opening figures
- using a 365-day year when the question specified a 360-day year
- inverting working capital ratio calculations

These errors could have been prevented by better understanding of this part of the syllabus.

Question 31(a)(ii)

This question required candidates to calculate the overdraft expected at the end of January, and hence assessed the ability to understand and apply relevant accounting ratios, and the ability to forecast cash position. Many candidates struggled with this question. It should be noted that although the question stated that the company had no cash and relied on its overdraft to finance daily operations, many answers considered only cash income and cash payments and ignored working capital movements, which would have been considered in a statement of cash flow.

Question 31(a)(iii)

This question asked candidates to calculate the company's opening and closing current ratio for the month. While the opening current ratio was usually calculated correctly, many candidates had difficulty calculating working capital movements relating to accounts receivable or accounts payable. Errors in these areas led to incorrect current ratio calculations.

Question 31(b)

This question required a discussion of five techniques that a company could use in managing accounts receivable and many candidates gained high marks here. Some candidates offered more than five techniques, however any discussion of techniques beyond the five required did not gain additional marks and hence represented wasted time. Some candidates discussed individual techniques at too great a length, failing as a result to discuss five techniques as required. This is where good time management should join with good subject knowledge to produce a balanced answer.

Many answers discussed assessing creditworthiness, offering early settlement discounts (not trade discounts), and using factoring and invoice discounting. Many answers discussed factoring and invoice discounting as separate techniques in managing accounts receivable, even though these are listed as one technique in the syllabus. Managing accounts receivable and collecting amounts owing were discussed less frequently and often in a piecemeal fashion. The technique discussed least frequently was managing foreign accounts receivable.

Question 32(a)

Candidates were asked here to discuss the difference between risk and uncertainty in relation to investment appraisal. Risk relates to the variability of returns and it can be measured by the probability of different returns being achieved by an investment project, that is, by attaching probabilities to different possible investment project outcomes. Risk can therefore be measured or quantified, whereas uncertainty cannot. Many answers showed little understanding of the link to variability of returns, tending to focus on quantifiable versus unquantifiable aspects.

Question 32(b)

This question asked candidates to calculate the NPV of an investment project and comment on its financial acceptability, considering taxation, inflation and a probability forecast of variable cost.

In questions relating to allowing for inflation and taxation in DCF techniques such as NPV, it is essential to understand and apply the information provided. Many errors arose from not following this advice, for example, using straight-line tax-allowable depreciation (TAD) when the question specified 25% reducing balance TAD, or charging tax liabilities in the year they arose when the question specified one year in arrears. Some answers placed tax liabilities one year in arrears, yet inconsistently placed TAD tax benefits in the year the TAD arose. Other answers based tax liabilities on sales income, or on contribution, rather than on taxable cash flow. Candidates would do well to remember that TAD is not a cash flow, as some answers treated TAD as an increase to taxable cash flow, resulting in TAD being taxed. Some answers omitted to incorporate a balancing allowance in their TAD calculation.

In relation to inflation, it was surprising to find some answers replacing inflation with deflation. An error made too frequently was applying one year's inflation to all years: candidates should remember that inflation is cumulative in its effect, like discounting.

Some answers used incorrect discount rates, indicating a lack of understanding in relation to the need to discount nominal cash flows with a nominal discount rate.

Some answers incorrectly placed the initial investment at the end of year 1, rather than year 0.

Some NPV calculations were incomplete, with unfinished present value calculations, missing years, or unjustified acceptability comments, such as 'Accept! Good project!'

In making the NPV calculation, candidates needed to calculate the expected value of variable cost as a step in calculating total variable cost. In addition to calculating the NPV of the investment project and commenting on its financial acceptability, candidates were asked to comment on the risk relating to variable cost. Many candidates were not able to see that the expected value calculation gave them the percentage chance of the investment project having a positive NPV.

Question 32(c)

Candidates were asked here to critically discuss how risk could be considered in the investment appraisal process. Four techniques that could be discussed are listed in the F9 study guide: sensitivity analysis, probability analysis, risk-adjusted discount rates and adjusted payback. Simulation could have been discussed as well, as part of probability analysis. While sensitivity analysis is not technically a technique that considers risk, which depends on probabilities, it is usually included in a discussion of risk in investment appraisal, perhaps because it is commonly seen as a method of assessing project risk. Emphasising the need to read the question carefully, answers were often not focussed on the question requirement, but discussed instead different kinds of risk, such as systematic risk, unsystematic risk, business risk, financial risk and exchange rate risk.

In some cases, even excellent NPV calculations were associated with a lack of understanding of the role played by the discount rate in building risk into investment appraisal.