

EGT3
ENGINEERING TRIPOS PART IIB

Day X Month 202X X.XX to X.XX

Module 4E6

ACCOUNTING AND FINANCE

*Answer not more than **two** questions.*

Answer not more than one question from each section.

All questions carry the same number of marks.

*The **approximate** percentage of marks allocated to each part of a question is indicated in the right margin.*

*Write your candidate number **not** your name on the cover sheet.*

STATIONERY REQUIREMENTS

Single-sided script paper

SPECIAL REQUIREMENTS TO BE SUPPLIED FOR THIS EXAM

CUED approved calculator allowed

Engineering Data Book

10 minutes reading time is allowed for this paper at the start of the exam.

You may not start to read the questions printed on the subsequent pages of this question paper until instructed to do so.

You may not remove any stationery from the Examination Room.

SECTION A

Answer not more than one question from this section

1.(a) The end-of-year trial balance before adjustment of Nova Company reports the following balances:

Table 1: Nova Company data

Account	Dr.	Cr.
Accounts receivable	\$150,000	
Allowance for doubtful accounts		\$2,500
Net Sales (all on credit)		\$810,000

- (i) Prepare the entries for estimated bad debts assuming that doubtful accounts are estimated to be 6% of gross accounts receivable.

Gross A/R = \$150,000

Required ending AFDA = $150,000 \times 0.06 = \$9,000$ (credit)

Current AFDA = \$2,500 (credit)

Adjustment needed = $9,000 - 2,500 = \$6,500$ (credit)

Journal entry (adjusting entry):

- Dr Bad Debt Expense \$6,500
- Cr Allowance for Doubtful Accounts \$6,500

(Optional T-account, same as the sample solution style)

AFDA

- Beg. balance (Cr) 2,500
- Adjustment (Cr) 6,500
- Ending balance (Cr) 9,000

[10%]

- (ii) Assume that all the information above is the same, except that the Allowance for Doubtful Accounts has a debit balance of \$2,500 instead of a credit balance. How will this difference affect the journal entries in part (i)?

A debit balance in AFDA means it's "negative allowance" (since AFDA is a contra-asset).

You still need to end at \$9,000 credit, so you must credit enough to:

- eliminate the \$2,500 debit, and
- build up to \$9,000 credit

Adjustment needed = $9,000 + 2,500 = \$11,500$ (credit)

Journal entry (adjusting entry):

- Dr Bad Debt Expense \$11,500
- Cr Allowance for Doubtful Accounts \$11,500

(Optional T-account)

AFDA

- Beg. balance (Dr) 2,500
- Adjustment (Cr) 11,500
- Ending balance (Cr) 9,000

[15%]

(iii) What circumstance would have led to a debit balance in Allowance for Doubtful Accounts?

A debit AFDA happens when actual write-offs exceeded the allowance previously built up (i.e. earlier bad-debt estimates were too low or defaults spiked).

Example logic (like the sample paper):

- AFDA began Cr 1,000, but write-offs during the year were 4,500 → net becomes Dr 3,500 (i.e. over-written-off relative to the reserve).

[15%]

(iv) Is the Allowance for Doubtful Accounts more about accurately portraying economic reality, or about protecting the company from future criticism and risk? Where should the balance lie between prudence and optimism in financial reporting?

- Mostly economic reality: A/R should be shown at net realizable value (what you expect to collect), and the bad-debt cost should be recognized in the same period as the credit sales that created the receivable.
- But it also reduces risk of overstatement: Understating AFDA inflates assets and profit and can lead to later “surprises,” criticism, and credibility damage.

Balance: aim for evidence-based prudence (neutral, supportable estimates), not:

- optimism (under-provisioning to inflate income), nor
- excessive conservatism (over-provisioning to create “cookie jar reserves” and smooth earnings).

[20%]

1.(b) Truston Corporation showed the following selected (i.e. incomplete) data in its 2025 balance sheet (that is, there could be asset, liability, and/or equity balances not included below):

Table 2: Truston Corporation Data

	31 Dec 2025	31 Dec 2024	Change
Cash	\$340,000	\$70,000	+ \$270,000
Accounts Receivable	\$130,000	\$150,000	- \$20,000
Land	\$320,000	\$400,000	- \$80,000
Property Plant and Equipment	\$200,000	\$200,000	0
Accumulated Depr: PPE	(\$40,000)	(\$20,000)	- \$20,000
Accounts Payable	\$35,000	\$45,000	- \$10,000
Bonds Payable	\$60,000	\$60,000	
Common Stock	\$400,000	\$350,000	+ \$50,000

During 2025:

- Truston Corp. sold land with a book value of \$80,000 for \$110,000 cash. No other long-term assets were bought or sold.
- Truston Corp. obtained an additional \$50,000 from equity (common stock) investors. No other transactions with owners or creditors took place during the year.

- (i) Compute Truston Corp.'s 2025 Net Income or Loss. Assume that any balance sheet accounts omitted above did not change during the year, with the exception of retained earnings.

[25%]

Hint: This is in fact a cash flow exercise and we learnt in class the indirect method for the cash flow from operations...

Guideline: To compute Truston Corp.'s 2025 Net Income or Loss, compute first Cash from from Investing and Cash flow from Financing and then, using the indirect method for Cash flow from Operations deduct the Net Income or Loss.

Cash Flow from Financing

Equity +50,000

Cash flow from Investing

Sale of land +110,000

Cash Flow from Operations

Net income

+depreciation +20,000

+decrease in Accounts Receivable +20,000

-decrease in Accounts Payable -10,000

-gains on asset sales -20,000

Cash flow from investing

Sale of land +110,000

Cash flow from Financing

Equity +50,000

Net change in cash = +270000

=> Cash flow from Operations = Net change in cash – Cash flow from financing –
Cash flow from investing = 270,000 – 50,000 – 110,000 = 110,000 Net income =
Cash flow from Operations – depreciation – decrease in Accounts Receivable +
decrease in Accounts Payable + Gain = 110,000 – 20,000 – 20,000 + 10,000 +
30,000 = 110,000

- (ii) If net income can be known without observing revenues or expenses, what does that imply about how we know profit?

The fact that net income can be determined without observing revenues or expenses implies that profit is fundamentally the change in net assets from non-owner sources, and the income statement merely provides a structured explanation of that change. Net income can be determined without observing individual revenues or expenses because profit is fundamentally the change in equity from non-owner sources. Revenues and expenses do not create profit; they explain it. The income statement is therefore a structured breakdown of how net assets changed, while the balance sheet captures the underlying economic result.

[15%]

2.(a) You are analysing Orion Infrastructure Group, a capital-intensive firm operating long-term public-private partnership (PPP) contracts.

Table 3: Extracts from Orion's Year t financials

Item	Amount (£m)
Revenue	1,600
Operating profit	140
Net income	20
Operating cash flow	- 60
Investing cash flow	- 550
Financing cash flow	650

Additional disclosures:

- Impairment of long-lived assets: £80m
- Trade receivables increased by 30% during the year
- No change in reported bad debt assumptions

(i) Explain how Orion can simultaneously report positive operating profit, negative operating cash flow, and positive net change in cash.

Orion's positive operating profit reflects accrual-based revenue recognition from long-term PPP contracts, even when cash has not yet been received. The 30% increase in trade receivables indicates that much of the reported revenue remains unpaid, reducing operating cash flow. Negative operating cash flow is therefore driven by working capital outflows and non-cash charges such as the £80m impairment. Despite this, total cash increases because the £650m financing inflow more than offsets cash used in operations and investment, allowing Orion to report a positive net change in cash.

[10%]

(ii) Explain the accounting logic of an impairment, including why it reduces reported earnings but does not affect operating cash flow. In your answer, also explain where an impairment is recognised in the financial statements, referring to both the income statement and the balance sheet.

An impairment reflects the requirement to write assets down when their carrying amount exceeds recoverable value. It reduces reported earnings because it is recognised as an expense in the income statement, lowering profit. However, it does not affect operating cash flow because no cash is paid when the impairment is recorded. On the balance sheet, the impairment reduces the carrying value of the related long-lived assets and equity, while cash remains unchanged.

[15%]

- (iii) Explain why rapid growth in receivables is often an early warning sign of underlying economic problems. Then identify two accounting choices management can use to delay recognition of such economic decline and explain briefly how these choices affect future reported performance.

Rapid receivables growth signals potential economic problems because it suggests customers are paying more slowly or revenues are being recognised before cash is secure. Management can delay recognition of deterioration by keeping bad debt assumptions unchanged, which inflates current earnings but leads to higher future write-offs, and by using aggressive revenue recognition, which boosts current profit but depresses future performance when receivables are impaired or revenues reverse.

[15%]

- (iv) Explain why cash is often viewed as more reliable than earnings and why this belief can fail in practice.

Cash is often seen as more reliable than earnings because it is less affected by estimates and accounting judgments. However, cash can be misleading because it is influenced by timing and financing decisions, such as delaying payments or raising debt, meaning strong cash flows do not always reflect strong underlying economic performance.

[10%]

2.(b) Quantum Corporation reported the following data for 2025:

Table 4: Quantum Corporation data

Item	Amount (£)
Net Income	20,000
Increase in A/P	3,000
Increase in Accounts Receivable	2,000
Depreciation Exp	10,000
Decrease in Inventory	2,000
Sale of Equipment	10,000 (book value was 9,000)
Dividends paid	4,000
New Loan Borrowed	12,000

- (i) Compute the Cash Flows from Financing [5%]
- (ii) Compute the Cash Flows from Investing [5%]
- (iii) Compute the Cash Flows from Operations using the indirect method [10%]
- (iv) If the January 1, 2025 Cash Balance in the Balance Sheet was £40,000, what is the December 31, 2025 Balance? [10%]
- (v) What financial condition (e.g. healthy or struggling) and what life-cycle stage (e.g. growing, steady, declining) do you think Quantum Corporation is in? More broadly, what story do these numbers tell about the company's priorities, risk appetite, and long-term strategy? [20%]

i) Cash Flow – Financing

- New loan borrowed: +12,000
- Dividends paid: -4,000
- Net cash from financing: +8,000

ii) Cash Flow – Investing

- 1. Sale of equipment: +10,000

iii) Cash Flows from Operations

- Net income: 20,000
- Add: Depreciation: 10,000
- Less: Gain on sale of equipment: -1,000

- Add: Increase in accounts payable: +3,000
 - Less: Increase in accounts receivable: -2,000
 - Add: Decrease in inventory: +2,000
- Net cash from operations: +32,000

iv) Total increase in cash

$$+8,000 + 10,000 + 32,000 = 50,000$$

Cash balance at 31 December 2017: £90,000 (50,000 + 40,000)

v) Quantum Corporation appears financially healthy, with strong operating cash flow (£32k) relative to net income (£20k), indicating good earnings quality and effective working-capital management. The payment of dividends (£4k) suggests the firm is in a mature or steady life-cycle stage, rather than a high-growth phase.

At the same time, the sale of equipment and the decision to take on new debt despite strong operating cash flows point to a cautious, liquidity-focused strategy. The sharp rise in cash from £40k to £90k suggests management is deliberately building cash reserves, possibly in preparation for future investment, risk management, or strategic repositioning. Overall, the numbers tell a story of a stable, cash-generative company with a moderate risk appetite and a liquidity-first approach.

SECTION B

Answer not more than one question from this section

3. Northland Power Inc (NPI) is a global power producer which develops, owns and operates energy infrastructure assets including offshore and onshore wind, solar, and natural gas. On November 12th 2025, the price of NPI shares closed \$24.92. After the closing bell that day, NPI reported its financial results for the 3rd quarter of 2025 (the 3-month period ending September 30th 2025). The announcement included a notice that its annual dividend per share will be reduced from \$1.20/share to \$0.72/share beginning January 1st 2026. NPI also announced a \$527 million non-cash accounting adjustment for an offshore wind facility near Germany. Also, it announced a delay in the start of revenue from an offshore wind project in Taiwan that would reduce 2026 revenues in the range of \$150 million to \$200 million. The opening share price on November 13th was \$19.11.

The following Summary of Consolidated Results was included in NPI's announcement of its Q3 financial results:

Table 5

Use the information contained in the announcement of the financial results (Table 5) after the closing bell on November 12th to answer the following questions:

(a) Calculate the market capitalisation of NPI at the closing bell (end of the trading session) on November 12th and at the opening bell (start of the trading session) on November 13th. What loss in both amount and percentage terms would an investor owning 100,000 shares of NPI on November 12th have incurred? Show your calculations.

Nov 12th: 261.502m (shares outstanding) x \$24.92 share price = \$6.52bn

Nov 13th: 261.502m (shares outstanding) x \$19.11 share price = \$4.99bn

Absolute loss amount for 100,000 shares \$5.81(loss/sh) x 100,000 (number of shares) = \$581,000

Percentage loss (can be calculated by using either market cap difference or share price

difference): $(\$6.52\text{bn} - \$4.99\text{bn})/\$6.52\text{bn} = 23.5\%$ (23.3% also correct due to approach rounding)

The loss is unrealised if the investor continues to hold the shares.

[30%]

(b) Separately calculate the dividend yield from January 1st 2026 using the share price at the closing bell on November 12th and the share price at the opening bell on November 13th; What is the amount of the reduction in the quarterly dividend income received by the investor owning 100,000 shares of NPI in 2026 versus 2025? Show your calculations.

Dividend from Jan 1, 2026 = **\$0.72 annually**

Previous annual dividend = **\$1.20**

Dividend yield at \$24.92/sh = $\$0.72/\$24.92 = 2.9\%$

Dividend yield at \$19.11/sh = $\$0.72/\$19.11 = 3.8\%$

Dividend income reduction $(100,000 \text{ shares} \times \$1.20/\text{YEAR}) - (100,000 \text{ shares} \times \$0.72 = \$48000/4 = \$12,000 \text{ per quarter.}$

[30%]

(c) Consider the information contained in the announcement of financial results (Table 5) and the change in share price after the announcement. In your opinion, is NPI perceived more as a growth stock or an income stock by investors in NPI shares? Explain why.

The sharp drop in the share price after the announcement indicates that investors were highly sensitive to:

- A large impairment (\$527m)
- A delay reducing 2026 revenue by \$150–200m
- A significant dividend cut

Dividend cuts are especially damaging for income stocks, where dividends are a central part of valuation. The price fall from \$24.92 to \$19.11 suggests investors previously valued NPI partly for income stability. The impairment and project delay also show sensitivity to growth risks, a feature of growth stock investors. **NPI was likely perceived as more of an income stock, because the dividend cut triggered a large negative price reaction, consistent with investor expectations of stable dividends.**

[20%]

(d) Calculate the payout ratios for the nine months to September 30th 2025 and the nine months to September 30th 2024. Explain what the payout ratio indicates about dividend sustainability and the reason why NPI decided to cut its dividend in that context.

[20%]

Formula

$$\text{Payout Ratio} = \frac{\text{Total dividends declared}}{\text{Free Cash Flow}}$$

Using the nine months ended September 30 figures from the Summary of Consolidated Results:

For the nine months to September 30, 2025

- Total dividends declared = \$235,195k
- Free Cash Flow = \$260,696k

$$\text{Payout Ratio}_{2025} = \frac{235,195}{260,696} \approx 0.902$$

$$\text{Payout Ratio}_{2025} = 90.2\%$$

For the nine months to September 30, 2024

- Total dividends declared = \$231,182k
- Free Cash Flow = \$313,771k

$$\text{Payout Ratio}_{2024} = \frac{231,182}{313,771} \approx 0.737$$

$$\text{Payout Ratio}_{2024} = 73.7\%$$

This indicates that the dividend became **less sustainable** in 2025 because a much larger share of cash flow was being distributed to shareholders, leaving less cash available for reinvestment, debt repayment, and funding new projects.

A payout ratio above 100% means the company is **paying more in dividends than it generates in Free Cash Flow**, which is not sustainable. The payout ratio trend for NPI suggests it is likely to exceed that threshold, particularly given the announcement of the delay in revenue from its wind project in Taiwan in 2026.

In that context, NPI's decision to cut its dividend is consistent with a desire to:

- improve dividend sustainability,
- retain more cash within the business,
- preserve financial flexibility, and
- support future investment while maintaining balance sheet strength.

4. Northland Power Inc (NPI) is a global power producer which develops, owns and operates energy infrastructure assets including offshore and onshore wind, solar, and natural gas. Assume that you are a prospective investor that attended the Northland Power Inc (NPI) annual investor day on November 20th 2025 when the price of NPI shares was \$20.00. The management presentation to investors included an estimate of free cash flow per share in 2025 in the range of \$1.15 to \$1.35 per share. NPI also announced that it will invest \$6 billion in equal instalments over the next 5 years in a new wind farm project which will generate a fixed annual return of 12% on the investment over the following 20 years.

(a) Calculate the intrinsic value per share of NPI today (20th November) which incorporates both (i) the no-growth valuation of NPI assuming the mid-point in the free cash flow per share range for 2025; and (ii) the net present value of the wind farm growth

opportunity. Assume the cost of capital is 5% and there are 261.502 million shares issued and outstanding.

[50%]

Step 1 — Calculate the no-growth valuation of NPI

Midpoint of NPI's 2025 free cash flow per share guidance:

$$\frac{1.15 + 1.35}{2} = 1.25 \text{ per share}$$

With no growth and discount rate $r = 5\%$:

$$P_0^{\text{no growth}} = \frac{1.25}{0.05} = \$25.00$$

Step 2 — Calculate the NPV of the Growth Opportunity (Wind Farm Project)

Present value of investment costs (Years 1–5)

Total investment: \$6 billion

Even instalments over 5 years:

$$\text{Annual investment} = \frac{6}{5} = 1.2 \text{ billion per year}$$

Discount each year at 5%:

$$PV_{\text{cost}} = \sum_{t=1}^5 \frac{1.2}{(1.05)^t} \approx 1.143 + 1.089 + 1.037 + 0.987 + 0.940$$
$$PV_{\text{cost}} \approx 5.19 \text{ billion}$$

Present value of returns (Years 6–25)

Annual return from the project:

$$0.12 \times 6 = 0.72 \text{ billion per year}$$

This lasts for 20 years, starting in year 6.

PV at year 5

$$PV_5 = 0.72 \times \frac{1 - (1.05)^{-20}}{0.05}$$

Compute annuity factor:

$$(1.05)^{-20} = 0.3769, 1 - 0.3769 = 0.6231$$
$$\frac{0.6231}{0.05} = 12.462$$
$$PV_5 = 0.72 \times 12.462 \approx 8.97 \text{ billion}$$

Discount back to today

$$PV_0 = \frac{8.97}{(1.05)^5} = \frac{8.97}{1.276} \approx 7.03 \text{ billion}$$

Net Present Value of wind farm project (PV of returns less PV of investment costs)

$$NPV = 7.03 - 5.19 = \mathbf{1.84 \text{ billion}}$$

Step 3: Calculate NPV per share (with 261.234 million shares)

$$NPV \text{ per share} = \frac{1.84 \text{ billion}}{261.502 \text{ million}} \approx \mathbf{7.04 \text{ per share}}$$

Step 4 — Calculate the total intrinsic value per share value of NPI today (sum of the no growth valuation per share and the NPV per share for the wind farm project)

$$P_0 = P_0^{\text{no growth}} + NPV \text{ per share} = 25.00 + 7.04$$

$$P_0 \approx \mathbf{\$32.04 \text{ per share}}$$

(b) Will a future change in the amount of dividend paid to investors affect your intrinsic share value calculation in 4 (a) assuming there is no change in free cash flow? Explain your answer.

[15%]

No. In a discounted cash flow valuation, **intrinsic value depends on free cash flow**, not on how the firm chooses to distribute that cash (dividends vs. retention).

If free cash flow does **not** change then cutting the dividend does not change value unless it signals information or a investment policy which reflects a change in risk.

(c) Assume that an investor is deciding whether to invest in either the shares or the bonds issued by NPI. The bonds have 5 years remaining to maturity, a face value of \$1,000, and an annual coupon rate of 7%.

(i) Calculate the yield to maturity (YTM) of the bond, assuming a market price of \$980. [10%]

Bond data:

- Face value = \$1,000
- Annual coupon rate = 7%
- Annual coupon = \$70
- Maturity = 5 years
- Current price = \$980

Calculation:

$$980 = \frac{70}{(1+r)} + \frac{70}{(1+r)^2} + \frac{70}{(1+r)^3} + \frac{70}{(1+r)^4} + \frac{1070}{(1+r)^5}$$

Using trial and error / calculator:

At $r = 7.5\%$

$$\begin{aligned} PV &\approx 70 \left(\frac{1 - (1.075)^{-5}}{0.075} \right) + \frac{1000}{(1.075)^5} \\ &\approx 70(4.10) + 697 \approx 287 + 697 = 984 \end{aligned}$$

More exact answer is around **7.6%**, but **7.5%** should be treated as correct.

- (ii) Calculate the expected annual return for an investor purchasing the shares today at \$20.00 per share, assuming the price of NPI shares in 5 years will converge to the intrinsic value per share calculated in part (a).

[10%]

Current share price = \$20.00

Intrinsic value from Question 4(a) = \$32.04

Assume convergence in 5 years

Calculation

$$\begin{aligned} r &= \left(\frac{32.04}{20.00} \right)^{1/5} - 1 \\ r &= (1.602)^{\frac{1}{5}} - 1 = 0.099 = 9.9\% \end{aligned}$$

Expected annual return on the shares = **9.9% per year.**

- (iii) Based on your answers to parts (i) and (ii), explain the factors an investor should consider when comparing the risk-adjusted return from investing in NPI shares versus NPI bonds. In your answer, refer to the difference in expected returns and the risks associated with each investment.

[15%]

- Expected return on shares: **~9.9%**
- Bond yield: **~7.5%**

The shares offer the **higher expected return**, but they are also **riskier**.

Relevant factors include:

1. Cash flow certainty

- **Bonds** provide fixed coupon payments and repayment of principal at maturity.
- **Shares** do not provide fixed returns; returns depend on future earnings, dividends, and share price movements.

2. Priority of claims

- Bondholders are paid before shareholders if the company faces distress or liquidation.
- Shareholders are residual claimants and therefore bear more risk.

3. Volatility / valuation risk

- Share returns depend on the assumption that the share price rises from \$20/sh toward intrinsic value.
- This may not happen if forecasts are wrong or market sentiment changes.
- Bond returns are more predictable if held to maturity, assuming no default

4. Compensation for risk

- The extra return on shares can be viewed as compensation for taking on the additional risk of equity ownership.

5. Investor preferences

- A **risk-averse investor** may prefer the bond because it offers more stable and predictable returns.
- A more **risk-tolerant investor** may prefer the shares because they offer higher expected return and upside potential.

END OF PAPER