3(a) **Using the data in Table 1.3, calculate the payback period for PPP's proposed new machine.**

Definition of payback: the amount of time it takes for the initial investment cost to be recovered (1 if no valid calculation)
(1.9) + 0.5 + 0.6 + 0.8 = 0 payback is 3 years or 36 months (2)
0.5 + 0.6 + 0.8 = 1.9 (1)

Correct units needed for full marks – years or months.

3(b) **Using the data in Table 1.3, calculate the accounting rate of return (ARR) for PPP's proposed new machine.**

ARR = average annual profit / average investment × 100 (1 if no valid calculation)

ARR = 0.2 / 0.95 × 100 = 21.05% or 21.1% or 21% (2)

Use of 'old' formula 0.2 / 1.9 × 100 = 10.53% (1)

Correct units required for full marks – %

3(c) **Evaluate whether PPP should invest in the new machine.**

Level	AO1 Knowledge and understanding 2 marks	AO2 Application 2 marks	AO3 Analysis 2 marks	AO4 Evaluation 6 marks
3				**5–6 marks** **Developed evaluation in context** • A developed judgement/conclusion is made in the business context. • Developed evaluative comments which balance some key arguments in the business context.
2	**2 marks** **Developed knowledge** of relevant key term(s) and/or factor(s) is used to answer the question.	**2 marks** **Developed application** of relevant point(s) to the business context.	**2 marks** **Developed analysis** that identifies connections between causes, impacts and/or consequences.	**3–4 marks** **Developed evaluation** • A developed judgement/conclusion is made. • Developed evaluative comments which balance some key arguments.
1	**1 mark** **Limited knowledge** of relevant key term(s) and/or factor(s) is used to answer the question.	**1 mark** **Limited application** of relevant point(s) to the business context.	**1 mark** **Limited analysis** that identifies connections between causes, impacts and/or consequences.	**1–2 marks** **Limited evaluation** • A judgement/conclusion is made with limited supporting comment/evidence. • An attempt is made to balance the arguments.
0	**0 marks** No creditable response.	**0 marks** No creditable response.	**0 marks** No creditable response.	**0 marks** No creditable response.

3(c) Responses may include:

AO1 Knowledge and understanding
Limited knowledge K *will be demonstrated through knowledge of one factor in investment decision / knowledge of impacts of process innovation.*
Developed knowledge K + K *+ will be demonstrated through knowledge of two factors in the investment decision / impacts of process innovation.*

Knowledge of process innovation and its impacts
Definition of process innovation: the move to new methods of production, in this case computer-controlled automation.
Less labour required.
Knowledge of factors in decision
- Investment cost.
- Availability of finance.
- Impact on employees.
- ARR and Payback results.
- Technical economies of scale possible.
- Reduction in average cost of production.
- Impact on quality.

AO2 Application
Limited application, APP *applies knowledge to PPP once.*
Developed application, APP + APP *applies knowledge to PPP twice.*

- Payback of 3 years – within 4 years of estimated life.
- Return of $800 000 over 4 year period.
- ARR of 21.05%
- Cost of machine $1 900 000
- NCL are $6 million and gearing is 45%, total CE is therefore $13.3 million
- Extra borrowing of $1.9 m would make gearing 7.9 / 15.2 = 51.97%
- Pies have a shelf-life, therefore over-stocking inadvisable

3(c) **AO3 Analysis**
Limited analysis AN *– candidate shows one link in the chain of analysis.*
Developed analysis L2 AN *– candidate shows two or more links in the chain of analysis.*

- Machine is costly, but the relatively high gearing of PPP increases risk of further borrowing AN causing cash flow problems for PPP L2 AN especially if sales fail to increase at the same rate as capacity increase.
- Employee training to deal with computer automated system will result in increased cost AN, but PPP has a reputation for good employee training, which could be boosted by this L2 AN
- Automation leads to increased efficiency AN and therefore eventually increased profit L2 AN.
- Introducing automation may cause disruption to operations in the short-term reducing output whilst it is installed AN possible damage to reputation if orders are not fulfilled resulting in lower sales L2 AN
- Automation will help PPP fulfil customer orders more quickly resulting in customer satisfaction AN and therefore an increase in sales L2 AN
- Automation may result in a reduction in the number of employees engaged in production which will reduce operating costs AN but this will also result in redundancy payments being made L2 AN
- If automation leads to excess stocks, waste may increase AN, which could lead to increased production cost L2 AN
- Work may become more boring for employees resulting in a reduction in motivation and therefore an increase in labour turnover AN increasing costs L2 AN

3(c)	**AO4 Evaluation** *Limited evaluation* EVAL *– limited supported judgement and/or a weak attempt at evaluative comment* *Developed evaluation* L2 EVAL *– supported judgement and/or reasonable evaluative comment* *Developed evaluation in contex* L3 EVAL *– supported judgement in context and/or reasonable evaluative comment in context.* • A judgement about whether to invest in automation/process innovation. • Elements that the evaluation/judgement might depend on: If automation is used, then success greatly depends on increased demand. How flexible might the machine be in changing from one type of pie to another? How well does automation fit with the ‘social objectives’ of PPP’s employment practices? How important might the ‘handmade’ aspect of PPP’s pies be in marketing? • Other factors to consider e.g. NPV as this considers time value of money. Depends on availability of finance linked to relatively high gearing and interest rate. How long will it take to install the automated system? Will specialist IT employees be required and how expensive is that? Opportunity cost of this project. • Weighing up of the factors and their relative influence on PPP’s decision whether to invest in the new machine Accept all valid responses