

Mark Scheme (Results) January 2010

Principal Learning

Manufacturing and Product Design MP301
Manufacturing Business Principles

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January 2010

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General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

Question Number	Answer	Mark						
1	1 mark for each correct answer	(2)						
	<table border="1"> <thead> <tr> <th>Activity</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td>Ensuring enough products are made to meet the customers orders on time.</td> <td>Production</td> </tr> <tr> <td>Investigating the application of new materials</td> <td>Research and development</td> </tr> </tbody> </table>		Activity	Function	Ensuring enough products are made to meet the customers orders on time.	Production	Investigating the application of new materials	Research and development
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Ensuring enough products are made to meet the customers orders on time.	Production							
Investigating the application of new materials	Research and development							

Question Number	Answer	Mark
2(a)	Micro scale manufacturing businesses employ 1 - 10 people (1)	(1)

Question Number	Answer	Mark
2(b)	Medium scale manufacturing businesses employ around 20 - 80 people (accept +/- 20) (1)	(1)

Question Number	Answer	Mark
2(c)	Large scale manufacturing businesses employ around 80 + people (accept - 20) (1)	(1)

Question Number	Answer	Mark
3(a)	<p>1 mark for each of the following to a maximum of 4 marks;</p> <ul style="list-style-type: none"> • Ensure the goods produced by the company are delivered to customers (1) • Goods delivered on time (1) • Goods delivered undamaged (1) • Keep records of drivers and journeys (1) • Update logistic plans (1) • Ensure goods delivered most cost effective way (1) <p>Any other suitable answer</p> <p>Other general management responsibilities could include;</p> <ul style="list-style-type: none"> • Ensure instructions from Directors/General Manager are followed (1) • Allocate work to other members of the team (1) • Solving day to day problems (1) • Managing departmental people and finance (1) <p>Any other suitable answer</p> <p>2 marks max for general management responsibilities only</p>	(4)

Question Number	Answer	Mark
3(b)	<p>1 mark for each of the following to a maximum of 6 marks;</p> <p>Advantages (up to 4 marks can be awarded)</p> <ul style="list-style-type: none"> • PM can plan maintenance when production is stopped (1) • PM can ensure production is the top priority for the maintenance team (1), advantage for production department, disadvantage for other departments that also use maintenance team (1) • Departmental objectives the same for Maintenance team production team (1) <p>Disadvantages (up to 4 marks can be awarded)</p> <ul style="list-style-type: none"> • Important maintenance may be postponed by PM leading to long term issues(1) • Other departments may be neglected by the maintenance team (1) • Maintenance team may be pressurised into improving aspects of the factory that only the PM feels are important (1) • PM may take a short term 'fire fighting' view (1) <p>Any other suitable answer</p>	(6)

Question Number	Indicative Content	
4	<p>1 mark for each of the following to a maximum of 4 marks;</p> <ul style="list-style-type: none"> • Carry out market research on; what customers want and how much the customers will pay (1) • Works with production team to plan production to fulfil customer requirements (1) • Promote products through advertising and sale promotions (1) • Works with Logistics to ensure delivery in line with customer requirements. (1) <p>Any other suitable answer</p>	(4)

Question Number	Indicative Content	
5	<p>Carbon offsetting is used by companies to reduce emission of greenhouse gases by supporting non-polluting technologies. This can be achieved by:</p> <ul style="list-style-type: none"> Completing a carbon footprint appraisal Calculating the emissions the business produces, this is known as the 'carbon footprint' Choosing to offset some or all of the unavoidable emissions Buying an equivalent amount of 'carbon credits' from projects that have saved carbon dioxide Using Carbon credits to pay for developing renewable energy supplies Supporting non-polluting technologies that would otherwise be financially non-viable. 	
Level	Mark	
	0	No rewardable material
1	1-2	Limited understanding of carbon offsetting demonstrated with one or two carbon offsetting techniques described
2	3-4	Clear understanding of carbon offsetting demonstrated with three or four carbon offsetting techniques described
3	5-6	Comprehensive understanding of carbon offsetting demonstrated with five or more carbon offsetting techniques described

Question Number	Answer	Mark
6(a)	a rise in the general level of prices of goods and services (1) in an economy over a period of time (1)	(2)

Question Number	Indicative Content	
6(b)	<p>Changes in exchange rates affect imports because a weak currency means the price of imported goods is high, which reduces the profitability of the finished goods. A strong currency would reduce the price of imported goods allowing greater profitability.</p> <p>Exchange rate changes affect exports, a strong currency means it will be more expensive to sell the completed product abroad; which makes it less attractive to buyers than competitors' products reducing market share/profits A weak currency would reduce the sale price abroad making a product more attractive to customers and increasing market share.</p>	
Level	Mark	
	0	No rewardable material
1	1-2	Limited knowledge demonstrated of the effects on imports or exports of exchange rate changes
2	3-4	Sound knowledge demonstrated of the effects on imports and exports of exchange rate changes
3	5-6	Comprehensive knowledge demonstrated of the effects on imports and exports of exchange rate changes in terms of strong and weak currencies

Question Number	Answer	Mark
7	<p>1 mark for each of the following to a maximum of 6 marks;</p> <ul style="list-style-type: none"> governments may provide cash payments for production of a given good or service (1) subsidies could include minimum price policies (1) Infrastructure subsidies may be used to help businesses develop in a region. (1) Companies which export may be given tax incentives which form a subsidy. (1) Government purchasing could be a form of subsidy (1) possibly through payment of higher-than-market prices for goods purchased (1) Subsidies could be provided to encourage training (1) particularly in national skill shortage areas (1) <p>Any other suitable answer</p>	(6)

Question Number	Answer	Mark									
8	<p>2 marks for each correct definition and 1 mark for an example of each</p> <table border="1"> <thead> <tr> <th>Term</th> <th>Definition</th> <th>Example</th> </tr> </thead> <tbody> <tr> <td>Direct Cost</td> <td>A cost which can be directly traced to a product (2)</td> <td>Materials (1); labour (1);</td> </tr> <tr> <td>Fixed Cost</td> <td>A cost which does not vary with changes in production volume (2)</td> <td>Rent (1); Insurance (1); Rates (1);</td> </tr> </tbody> </table>	Term	Definition	Example	Direct Cost	A cost which can be directly traced to a product (2)	Materials (1); labour (1);	Fixed Cost	A cost which does not vary with changes in production volume (2)	Rent (1); Insurance (1); Rates (1);	(6)
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Question Number	Answer	Mark
9	<p>Award 1 mark for each valid point identified and 1 mark for a valid description up to a maximum of 9 marks</p> <p>Shortage of local labour (up to 4 marks can be awarded)</p> <ul style="list-style-type: none"> • Increased recruitment costs • Difficulties in recruitment • Increased wages bill • Increased outsourcing • Government subsidies/grants • Increased training costs <p>Globalisation (up to 4 marks can be awarded)</p> <ul style="list-style-type: none"> • Increased competition • Movement of production to countries where labour is cheaper • Increase in multi-national companies • Worldwide markets for goods and services • Worldwide supply chain <p>Environmental legislation (up to 4 marks can be awarded)</p> <ul style="list-style-type: none"> • Control of CO₂ emissions • Control of pollution • Carbon offsetting • Recycling of waste material • Increase in process efficiency • Production of sustainable/recyclable products 	(9)

Question Number	Answer	Mark
10(a)	<p>2 marks for 2 valid points.</p> <ul style="list-style-type: none"> • Items are sent to production in a crate/box etc (1) • When the crate is almost empty a card is sent to stores (1) • A full box is then sent back to replace the empty one (1) • New parts are not made until a Kanban card is received (1) 	(2)

Question Number		Indicative Content
10(b)		<p>Advantages</p> <ul style="list-style-type: none"> • Reduced inventory • Reduced storage costs • Reduced storage space • Reduced storage of unsold stock • "Pull" system • Regular production patterns • Reduced WIP <p>Disadvantages</p> <ul style="list-style-type: none"> • No room for mistakes • Minimal stock is kept • No inventory if unexpected orders arise • Increased reliance on suppliers
Level	Mark	
	0	No rewardable material
1	1-2	Limited understanding of JIT with one or two advantages or disadvantages
2	3-4	Clear understanding of JIT with three or four advantages/disadvantages
3	5-6	Comprehensive understanding of JIT with two or more advantages and two or more disadvantages

Question Number	Answer	Mark
11	<ul style="list-style-type: none"> • research and development is vital for the survival of a company in order to develop value added products(1) • In markets where there is a demand for 'green' products, companies may need to revise existing designs (1)/changing preference of customers (1) • R&D is needed due to continuous technology change (1) • Development of competitors' products needs to be matched (1) • Market research should be used to identify what consumers want (1) this informs the strategic planning of an enterprise and the research and development of new goods and services(1) • New technologies/Sustainable product development may give the company a competitive edge over rivals (1) • Production processes could be developed to be more sustainable/efficient (1) which could save the company money (1) • Some smaller enterprises are less likely to be price competitive (1) investing in R & D enables them to be product competitive (1) • Smaller enterprises don't benefit from economies of scale (1) and investing in R & D enables them to be process/price competitive (1) 	(8)

Question Number	Answer	Mark
12	<p>Cash flow (up to 2 marks can be awarded)</p> <p>A comparison of the money coming into the business from sales(1) and money going out of the business to pay for the cost of production(1)</p> <p>Residual values (up to 2 marks can be awarded)</p> <p>The value of a fixed asset after depreciation(1), the amount a company expects to sell a fixed asset for after its useful life(1) - in terms of percentage of depreciation of its initial value(1)</p>	(4)

Question Number	Answer	Mark
13	<p>Four valid points required for full marks.</p> <p>They help the business to understand the contribution different factors make to sales performance (1) which can then be investigated further (1) and adjustments made where necessary (1)</p> <p>They can be used to calculate the effects of competitors (1) and how this will change demand for the company's products (1) which may cause changes to be made to production output (1)</p> <p>They help the business to develop strategic planning (1) which will influence research and development (1) and recruitment/training needs(1)</p>	(4)

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14(a)	<table border="1"> <thead> <tr> <th colspan="4">PROFIT AND LOSS ACCOUNT</th> </tr> <tr> <th></th> <th>(£000)</th> <th>(£000)</th> <th>(£000)</th> </tr> </thead> <tbody> <tr> <td colspan="4">Income</td> </tr> <tr> <td>Turnover</td> <td></td> <td></td> <td>650</td> </tr> <tr> <td colspan="4">Cost of Sales</td> </tr> <tr> <td>Materials</td> <td>70</td> <td></td> <td></td> </tr> <tr> <td>Wages</td> <td>130</td> <td></td> <td></td> </tr> <tr> <td>Total</td> <td></td> <td>(200)</td> <td></td> </tr> <tr> <td>GROSS PROFIT/LOSS</td> <td></td> <td></td> <td>450</td> </tr> <tr> <td colspan="4">Promotions</td> </tr> <tr> <td>Advertising</td> <td>30</td> <td></td> <td></td> </tr> <tr> <td>Total</td> <td></td> <td>(30)</td> <td></td> </tr> <tr> <td colspan="4">Expenses</td> </tr> <tr> <td>Rent</td> <td>75</td> <td></td> <td></td> </tr> <tr> <td>Utilities</td> <td>45</td> <td></td> <td></td> </tr> <tr> <td>Total</td> <td></td> <td>(120)</td> <td></td> </tr> <tr> <td>NET PROFIT/LOSS BEFORE TAX</td> <td></td> <td></td> <td>300</td> </tr> </tbody> </table>	PROFIT AND LOSS ACCOUNT					(£000)	(£000)	(£000)	Income				Turnover			650	Cost of Sales				Materials	70			Wages	130			Total		(200)		GROSS PROFIT/LOSS			450	Promotions				Advertising	30			Total		(30)		Expenses				Rent	75			Utilities	45			Total		(120)		NET PROFIT/LOSS BEFORE TAX			300	
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	<ul style="list-style-type: none"> • 1 mark for Rent or Utilities under the correct heading. (1) • Advertising under the correct heading (1) • Use of brackets to signify debits in middle column (1) • Correct answer for net profit/loss (allow follow through for '000' errors) (1) 	(4)
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Question Number	Answer	Mark
14(b)	<p>Accept two valid points, 1 mark for identification and 1 mark for description</p> <ul style="list-style-type: none"> • Increase the level of advertising (1) which will raise awareness of the product in the marketplace (1) and should therefore lead to an increase in demand (1) and revenue. • Reduce sales prices (1) which would make the product more attractive to potential customers (1) which although reduces income per item sold, the overall increase in volume should increase total sales income (1) <p>Accept similar, appropriate responses.</p>	(2)

Question Number	Answer	Mark
15	<p>NB: Calculations could be of any form.</p> <p>(i) $ROI = (\text{benefits}/\text{costs}) \times 100$</p> <p>Product A $= (86770/120740) \times 100 = 71.8\% (1)$</p> <p>Product B $= (63700/69250) \times 100 = 92.0\% (1)$</p> <p>Product B should be developed as it has the higher ROI(1)</p> <p>ii) $\text{payback periods} = \text{costs}/\text{monthly benefits}$</p> <p>Product A: Monthly benefits = $86770/24 = 3615$ Payback period = $120740/3615 = 33.3 \text{ months} (1)$</p> <p>Product B: Monthly benefits = $63700/12 = 5308$ Payback period = $69250/5308 = 13 \text{ months} (1)$</p> <p>Product B should be selected since it has the lower payback period (1)</p>	(6)

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