**Accounting and Finance**

**Unit 3**

**Accounting and Finance For WA**

**Chapter 5 – Cost-Volume-Profit Analysis and Relevant Costing**

**Test Your Knowledge**

**Question 1**

**Define each of the following terms and provide examples of the types of costs that would be included:**

**a fixed costs –** costs that do not change with the level of business activity are called fixed costs and would include the rent of business premises, insurance, salaries of supervisory staff, etc.

**b variable costs –** costs that change in proportion to the level of production are variable costs and would include the cost of materials used in the manufacturing process to make each unit, the wages of factory workers per unit, the amount of energy used in production (such as oil, gas or electricity), etc.

**c mixed costs –** some costs are a mixture of both fixed and variable costs and would include wages where the fixed element is the normal weekly wages of production staff and the variable component is any overtime required.

**Question 2**

**Fred runs a fast food shop making hamburgers. Identify whether the following expenses are fixed or variable costs.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Type of Costs** | **Variable Costs** | **Fixed Costs** | **Mixed Costs** |
| **Electricity** |  |  | **✓** |
| **Packaging** | **✓** |  |  |
| **Wages – Full Time** |  | **✓** |  |
| **Wages - Casuals** | **✓** |  |  |
| **Water** | **✓** |  |  |
| **Materials Purchased** | **✓** |  |  |
| **Depreciation On Equipment** |  | **✓** |  |
| **Depreciation On Office Furniture** |  | **✓** |  |

**Question 3**

**How is the break-even point calculated and why is it necessary for it to be calculated?**

To calculate the break-even point the profit is set at zero (0) and the number of units required are calculated. The break-even point can be expressed as a number of units or as a total dollar value of sales. If a business owner knows the break-even point, they can make informed decisions about pricing, production levels, and other factors that impact the bottom line.

**Question 4**

**What is the difference between the contribution margin and the gross profit? What are the relevant expenses that are included in calculating both amounts?**

The contribution margin is the selling price of a unit less the direct variable costs per unit. The amount is the financial contribution each unit makes to cover the fixed costs. When the volume of sales is sufficient, after the fixed costs have been covered, to leave an excess, this is the gross profit.

When calculating the contribution margin the relevant expenses are the variable costs. When calculating gross profit the relevant expenses are the variable costs plus the fixed costs.

**Question 5**

**Explain the concept of margin of safety and why it is important in management decision-making.**

The margin of safety of a product or service is the amount by which expected sales are greater than the break-even point. The higher the safety of margin, the better when comparing alternative products. This calculation is important in management decision-making, as the percentage by which sales might decrease, before the product begins to incur a loss, can be calculated.

**Question 6**

**In a manufacturing business what will be the effect on profit and break-even point of the following changes?**

|  |  |  |
| --- | --- | --- |
|  | **Profit** | **Number of Units to Break-Even** |
| **Selling Price Increases** | Increases | Increases |
| **Fixed Costs Increase** | Decreases | Increases |
| **Variable Costs Decrease** | Increases | Decreases |
| **Units of Production Decrease** | Decreases | Decreases |

**Question 7**

**Apart from the profit contribution, what other factors must a manager consider when making a decision to stop making a product or close a department?**

The contribution margin must be calculated, as well as the fixed costs, in order to correctly assess whether to stop making a product or close a department. However, other qualitative issues need to be considered as well, such as whether these decisions will adversely affect customers, employees, or suppliers, as well as potential retaliation from competitors and legal constraints.

**Question 8**

**A bakery can make both cakes and breads but chooses to make cakes only. What cost factors might influence the bakery to restrict its sales to one product only?**

The variable costs would be the major factor to consider in the short term, however fixed costs might increase over the long term as well. An increase in the price of ingredients, electricity or the wages of workers would impact the variable costs, while an increase in insurance of premises or delivery vehicles or the increase of rent of premises would impact the fixed costs.

**Question 9**

**Major airlines like Qantas often have alliances with other airlines to transport Qantas passengers on some routes. Why would Qantas not use its own aircraft?**

The most likely reason is that Qantas is running at capacity with its current fleet of aircraft and, therefore, does not have enough aircraft to run all routes itself. Additionally, it is probably cheaper to outsource these flights to other airlines, rather than to purchase additional aircraft to cover those routes.

**Question 10**

**Explain what qualitative factors might influence a business to accept or reject a product or service other than profit.**

If accepting the product or service had a negative impact on the business’s customer base, their employees or suppliers, the business might decide against accepting it, even if the figures projected were good (ie. profit). Additionally, they may accept a product or service, even though the figures projected are bad (ie. a loss), in order to stop their competitors from gaining full control of the market.

**Question 11**

**If the contribution margin on a special order is positive, explain what might cause a business not to accept the special order.**

The business might not accept a special order, even though the contribution margin is positive, because they might lose existing customers if they cannot meet normal demand due to taking on the special order, there might be a negative impact on their employees (ie. a huge increase of working hours), there might be legal constraints that have caused a road block to the special order or their suppliers cannot meet the demand for the raw materials required to produce the special order.

**Test Your Understanding**

**Question 5.1**

|  |  |
| --- | --- |
| **Profit =** | **(SP x QS) – [(VC x QS) + TFC]** |

|  |  |
| --- | --- |
| **Profit =** | (4.50 x 4 000) – [(2.00 x 4 000) + 7 000] |

|  |  |
| --- | --- |
| **Profit =** | 18 000 – 15 000 |

|  |  |
| --- | --- |
| **Profit =** | **$3 000** |

**Question 5.2**

|  |  |
| --- | --- |
| **Profit =** | **TR - TC** |

|  |  |
| --- | --- |
| **Profit =** | (**18 000 x 1.10**) – 15 000 |

|  |  |
| --- | --- |
| **Profit =** | 19 800 – 15 000 |

|  |  |
| --- | --- |
| **Profit =** | **$4 800** |

**OR**

|  |  |
| --- | --- |
| **Profit =** | **(SP x QS) – [(VC x QS) + TFC]** |

|  |  |
| --- | --- |
| **Profit =** | (4.95 (**4.50 x 1.10**) x 4 000) – [(2.00 x 4 000) + 7 000] |

|  |  |
| --- | --- |
| **Profit =** | 19 800 – 15 000 |

|  |  |
| --- | --- |
| **Profit =** | **$4 800** |

**Question 5.3**

|  |  |
| --- | --- |
| **Contribution Margin =** | **SP Per Unit – VC Per Unit** |

|  |  |
| --- | --- |
| **Contribution Margin =** | 4.50 – 2.00 |

|  |  |
| --- | --- |
| **Contribution Margin =** | **$2.50** |

|  |  |
| --- | --- |
| **Forecast Target Revenue (In Units)** | **TFC + Profit** |
| **Contribution Margin Per Unit** |

|  |  |
| --- | --- |
| **Forecast Target Revenue (In Units)** | 7 000 + 10 000 |
| 2.50 |

|  |  |
| --- | --- |
| **Forecast Target Revenue (In Units)** | **6 800 Units** |

**OR**

|  |  |
| --- | --- |
| **Profit =** | **(SP x QS) – [(VC x QS) + TFC]** |

|  |  |
| --- | --- |
| 10 000 **=** | (4.50 x **QS**) – [(2.00 x **QS**) + 7 000] |

|  |  |
| --- | --- |
| (4.50 – 2.00) x **QS =** | 10 000 + 7 000 |

|  |  |
| --- | --- |
| **QS =** | 17 000/2.50 |

|  |  |
| --- | --- |
| **QS =** | **6 800 Units** |

**Question 5.4**

|  |  |
| --- | --- |
| **Unit Cost** | **TC + Profit** |
| **Number Of Units** |

|  |  |
| --- | --- |
| **Unit Cost** | (7 000 + 24 000 (**12 000 x 2.00**)) + 21 800 |
| 12 000 |

|  |  |
| --- | --- |
| **Unit Cost** | 7 000 + 24 000 + 21 800 |
| 12 000 |

|  |  |
| --- | --- |
| **Unit Cost** | **$4.40 Per Unit** |

**OR**

|  |  |
| --- | --- |
| **Profit =** | **(SP x QS) – [(VC x QS) + TFC]** |

|  |  |
| --- | --- |
| 21 800 **=** | (**SP** x 12 000) – [(2.00 x 12 000) + 7 000] |

|  |  |
| --- | --- |
| **SP =** | (21 800 + 24 000 + 7 000)/12 000 |

|  |  |
| --- | --- |
| **SP =** | 52 800/12 000 |

|  |  |
| --- | --- |
| **SP =** | **$4.40 Per Unit** |

**Question 5.5**

**Requirement A**

|  |  |
| --- | --- |
| **Contribution Margin =** | **SP Per Unit – VC Per Unit** |

|  |  |
| --- | --- |
| **Contribution Margin =** | 600 – (200 + 150 + 80 + 30) |

|  |  |
| --- | --- |
| **Contribution Margin =** | 600 – 460 |

|  |  |
| --- | --- |
| **Contribution Margin =** | **$140** |

**Requirement B**

|  |  |
| --- | --- |
| **Break-Even Point (Units) =** | **Total Fixed Costs** |
| **Contribution Margin** |

|  |  |
| --- | --- |
| **Break-Even Point (Units) =** | 670 000 |
| 140 |

|  |  |
| --- | --- |
| **Break-Even Point (Units) =** | **4 786 Desks** |

**Requirement C**

|  |  |
| --- | --- |
| **Break-Even Point (Sales Dollars) =** | **Units x Sales Price Per Unit** |

|  |  |
| --- | --- |
| **Break-Even Point (Sales Dollars) =** | 4 786 x 600 |

|  |  |
| --- | --- |
| **Break-Even Point (Sales Dollars) =** | **$2 871 600** |

**Requirement D**

|  |  |
| --- | --- |
| **Profit =** | **(SP x QS) – [(VC x QS) + TFC]** |

|  |  |
| --- | --- |
| **Profit =** | (600 x 7 000) – [(460 x 7 000) + 670 000] |

|  |  |
| --- | --- |
| **Profit =** | 4 200 000 – 3 890 000 |

|  |  |
| --- | --- |
| **Profit =** | **$310 000** |

**Requirement E**

|  |  |
| --- | --- |
| **Profit =** | **(SP x QS) – [(VC x QS) + TFC]** |

|  |  |
| --- | --- |
| $100 000 = | (600x **QS**) – [(460 x **QS**) + 670 000] |

|  |  |
| --- | --- |
| **Number of Desks =** | (670 000 + 100 000)/140 |

|  |  |
| --- | --- |
| **Number of Desks =** | **5 500** |

**Requirement F**

|  |  |
| --- | --- |
| **Break-Even Point (Units) =** | **Total Fixed Costs** |
| **Contribution Margin** |

|  |  |
| --- | --- |
| **Break-Even Point (Units) =** | 710 000 |
| 140 |

|  |  |
| --- | --- |
| **Break-Even Point (Units) =** | **5 072 Desks** |

|  |  |
| --- | --- |
| **Profit =** | **(SP x QS) – [(VC x QS) + TFC]** |

|  |  |
| --- | --- |
| **Profit =** | (600x **(7 000 x 1.05)** – [(460 x **(7 000 x 1.05)** + **710 000**] |

|  |  |
| --- | --- |
| **Profit =** | 4 410 000 – 4 091 000 |

|  |  |
| --- | --- |
| **Profit =** | **$319 000** |

|  |
| --- |
| The break-even point would increase from 4 786 desks to 5 072 desks which is not desirable. However, the profit would increase by $9 000, so the proposal might be accepted based on that figure. |

**Requirement G**

|  |  |
| --- | --- |
| **Direct Labour =** | 150 x 0.90 |

|  |  |
| --- | --- |
| **Direct Labour =** | **$135** |

|  |  |
| --- | --- |
| **Variable Factory Overhead =** | 80 x 0.95 |

|  |  |
| --- | --- |
| **Variable Factory Overhead =** | **$76** |

|  |  |
| --- | --- |
| **Amended Total Variable Costs =** | 200 + 135 + 76 + 30 |

|  |  |
| --- | --- |
| **Amended Total Variable Costs =** | **$441** |

|  |  |
| --- | --- |
| **Contribution Margin =** | **SP Per Unit – VC Per Unit** |

|  |  |
| --- | --- |
| **Contribution Margin =** | 600 – (200 + 135 + 76 + 30) |

|  |  |
| --- | --- |
| **Contribution Margin =** | 600 – 441 |

|  |  |
| --- | --- |
| **Contribution Margin =** | **$159** |

|  |  |
| --- | --- |
| **Break-Even Point (Units) =** | **Total Fixed Costs** |
| **Contribution Margin** |

|  |  |
| --- | --- |
| **Break-Even Point (Units) =** | 670 000 |
| 159 |

|  |  |
| --- | --- |
| **Break-Even Point (Units) =** | **4 214 Desks** |

|  |  |
| --- | --- |
| **Amended Selling Price =** | 600 x 0.92 |

|  |  |
| --- | --- |
| **Amended Selling Price =** | **$552** |

|  |  |
| --- | --- |
| **Amended Sales Volume =** | 7 000 x 1.07 |

|  |  |
| --- | --- |
| **Amended Sales Volume =** | **7 490 Desks** |

|  |  |
| --- | --- |
| **Profit =** | **(SP x QS) – [(VC x QS) + TFC]** |

|  |  |
| --- | --- |
| **Profit =** | (**552** x **7 490**) – [(**441** x **7 490)** + 670 000] |

|  |  |
| --- | --- |
| **Profit =** | 4 134 480 – [3 303 090 + 670 000] |

|  |  |
| --- | --- |
| **Profit =** | 4 134 480 – 3 973 090 |

|  |  |
| --- | --- |
| **Profit =** | **$161 390** |

|  |
| --- |
| The break-even point would decrease from 4 786 desks to 4 214 desks which is desirable. However, the profit would decrease by $148 610, which is a big drop, so the proposal would not be accepted. |

**Requirement H**

|  |  |
| --- | --- |
| **Margin of Safety (In Dollars) =** | **Actual or Budgeted Sales – Break-Even Sales** |

|  |  |
| --- | --- |
| **Margin of Safety (In Dollars) =** | 4 134 480 (7 490 x 552) – 2 341 032 (4 241 x 552) |

|  |  |
| --- | --- |
| **Margin of Safety (In Dollars) =** | **$1 793 448** |

|  |  |  |
| --- | --- | --- |
| **Margin of Safety (%) =** | **Margin of Safety (In Dollars)** | **X 100** |
| **Total Actual/Budgeted Sales** |

|  |  |  |
| --- | --- | --- |
| **Margin of Safety (%) =** | 1 793 448 | X 100 |
| 4 134 480 |

|  |  |  |
| --- | --- | --- |
| **Margin of Safety (%) =** | 0.43377837116 | X 100 |

|  |  |
| --- | --- |
| **Margin of Safety (%) =** | **43.4%** |

**Question 5.7**

**Requirement A**

|  |  |
| --- | --- |
| **Contribution Margin =** | **SP Per Unit – VC Per Unit** |

|  |  |
| --- | --- |
| **Contribution Margin =** | (21.00 x 0.98) – (5 + 8.25 + 1.50) |

|  |  |
| --- | --- |
| **Contribution Margin =** | 20.58 – 14.75 |

|  |  |
| --- | --- |
| **Contribution Margin =** | **$5.83** |

|  |  |
| --- | --- |
| **Break-Even Point (Units) =** | **Total Fixed Costs** |
| **Contribution Margin** |

|  |  |
| --- | --- |
| **Break-Even Point (Units) =** | 16 000 |
| 5.83 |

|  |  |
| --- | --- |
| **Break-Even Point (Units) =** | **2 745 Compost Bins** |

**Requirement B**

|  |  |
| --- | --- |
| **Profit =** | **(SP x QS) – [(VC x QS) + TFC]** |

|  |  |
| --- | --- |
| **Profit =** | (20.58 x 4 000) – [(14.75 x 4 000) + 16 000] |

|  |  |
| --- | --- |
| **Profit =** | 82 320 – 75 000 |

|  |  |
| --- | --- |
| **Profit =** | **$7 320** |

**Requirement C**

|  |
| --- |
| The company would proceed in the investment in the plant to produce the compost bin as it would bring in a profit of $7 320. |

**Question 5.8**

**Requirement A**

|  |
| --- |
| **Standard Calculation** |

|  |  |
| --- | --- |
| **Contribution Margin =** | **SP Per Unit – VC Per Unit** |

|  |  |
| --- | --- |
| **Contribution Margin =** | 1 950 – 980 |

|  |  |
| --- | --- |
| **Contribution Margin =** | **$970** |

|  |  |
| --- | --- |
| **Break-Even Point (Units) =** | **Total Fixed Costs** |
| **Contribution Margin** |

|  |  |
| --- | --- |
| **Break-Even Point (Units) =** | 1 860 000 |
| 970 |

|  |  |
| --- | --- |
| **Break-Even Point (Units) =** | **1 918 Computers** |

|  |  |
| --- | --- |
| **Break-Even Point (Sales) =** | 1 918 x 1 950 |

|  |  |
| --- | --- |
| **Break-Even Point (Sales) =** | **$3 740 100** |

|  |
| --- |
| **Marketing Manager’s Proposal** |

|  |  |
| --- | --- |
| **Contribution Margin =** | **SP Per Unit – VC Per Unit** |

|  |  |
| --- | --- |
| **Contribution Margin =** | 1 853 (**1 950 x 0.95**) – 980 |

|  |  |
| --- | --- |
| **Contribution Margin =** | **$873** |

|  |  |
| --- | --- |
| **Break-Even Point (Units) =** | **Total Fixed Costs** |
| **Contribution Margin** |

|  |  |
| --- | --- |
| **Break-Even Point (Units) =** | 1 930 000 (**1 860 000 + 20 000 + 50 000**) |
| 873 |

|  |  |
| --- | --- |
| **Break-Even Point (Units) =** | **2 211 Computers** |

|  |  |
| --- | --- |
| **Break-Even Point (Sales) =** | 2 211 x 1 853 |

|  |  |
| --- | --- |
| **Break-Even Point (Sales) =** | **$4 096 983** |

|  |
| --- |
| **Production Manager’s Proposal** |

|  |  |
| --- | --- |
| **Contribution Margin =** | **SP Per Unit – VC Per Unit** |

|  |  |
| --- | --- |
| **Contribution Margin =** | 1 853 (**1 950 x 0.95**) – 931 (**980 x 0.95)** |

|  |  |
| --- | --- |
| **Contribution Margin =** | **$922** |

|  |  |
| --- | --- |
| **Break-Even Point (Units) =** | **Total Fixed Costs** |
| **Contribution Margin** |

|  |  |
| --- | --- |
| **Break-Even Point (Units) =** | 1 767 000 (**1 860 000 x 0.95**) |
| 922 |

|  |  |
| --- | --- |
| **Break-Even Point (Units) =** | **1 917 Computers** |

|  |  |
| --- | --- |
| **Break-Even Point (Sales) =** | 1 917 x 1 853 |

|  |  |
| --- | --- |
| **Break-Even Point (Sales) =** | **$3 552 201** |

**Requirement B**

|  |
| --- |
| **Standard Calculation** |

|  |  |
| --- | --- |
| **Margin of Safety (In Dollars) =** | **Actual or Budgeted Sales – Break-Even Point (Sales)** |

|  |  |
| --- | --- |
| **Margin of Safety (In Dollars) =** | 9 750 000 – 3 740 100 |

|  |  |
| --- | --- |
| **Margin of Safety (In Dollars) =** | **$6 009 900** |

|  |  |  |
| --- | --- | --- |
| **Margin of Safety (%) =** | **Margin of Safety (In Dollars)** | **x 100** |
| **Total Actual/Budgeted Sales** |

|  |  |  |
| --- | --- | --- |
| **Margin of Safety (%) =** | 6 009 900 | x 100 |
| 9 750 000 |

|  |  |  |
| --- | --- | --- |
| **Margin of Safety (%) =** | 0.6164 | x 100 |

|  |  |
| --- | --- |
| **Margin of Safety (%) =** | **61.6%** |

|  |
| --- |
| **Marketing Manager’s Proposal** |

|  |  |
| --- | --- |
| **Margin of Safety (In Dollars) =** | **Actual or Budgeted Sales – Break-Even Point (Sales)** |

|  |  |
| --- | --- |
| **Margin of Safety (In Dollars) =** | 10 188 750 **(9 750 000 x 0.95) x 1.1)** – 4 096 983 |

|  |  |
| --- | --- |
| **Margin of Safety (In Dollars) =** | **$6 091 767** |

|  |  |  |
| --- | --- | --- |
| **Margin of Safety (%) =** | **Margin of Safety (In Dollars)** | **x 100** |
| **Total Actual/Budgeted Sales** |

|  |  |  |
| --- | --- | --- |
| **Margin of Safety (%) =** | 6 091 767 | x 100 |
| 10 188 750 |

|  |  |  |
| --- | --- | --- |
| **Margin of Safety (%) =** | 0.59789149797 | x 100 |

|  |  |
| --- | --- |
| **Margin of Safety (%) =** | **59.8%** |

|  |
| --- |
| **Production Manager’s Proposal** |

|  |  |
| --- | --- |
| **Margin of Safety (In Dollars) =** | **Actual or Budgeted Sales – Break-Even Point (Sales)** |

|  |  |
| --- | --- |
| **Margin of Safety (In Dollars) =** | 10 188 750 **(9 750 000 x 0.95) x 1.1)** – 3 552 201 |

|  |  |
| --- | --- |
| **Margin of Safety (In Dollars) =** | **$6 636 549** |

|  |  |  |
| --- | --- | --- |
| **Margin of Safety (%) =** | **Margin of Safety (In Dollars)** | **x 100** |
| **Total Actual/Budgeted Sales** |

|  |  |  |
| --- | --- | --- |
| **Margin of Safety (%) =** | 6 636 549 | x 100 |
| 10 188 750 |

|  |  |  |
| --- | --- | --- |
| **Margin of Safety (%) =** | 0.6513604711 | x 100 |

|  |  |
| --- | --- |
| **Margin of Safety (%) =** | **65.1%** |

|  |
| --- |
| The Marketing Manager’s Proposal is the proposal at most risk, sitting at 59.8%. The Standard Calculation comes next at 61.6%, while the Production Manager’s Proposal has the least amount of risk at 65.1% |

**Requirement C**

|  |
| --- |
| **Standard Calculation** |

|  |  |
| --- | --- |
| **Profit =** | **(SP x QS) – [(VC x QS) + TFC]** |

|  |  |
| --- | --- |
| **Profit =** | (1 950 x 5 000) – [(980 x 5 000) + 1 860 000] |

|  |  |
| --- | --- |
| **Profit =** | 9 750 000 – 6 760 000 |

|  |  |
| --- | --- |
| **Profit =** | **$2 990 000** |

|  |
| --- |
| **Marketing Manager’s Proposal** |

|  |  |
| --- | --- |
| **Profit =** | **(SP x QS) – [(VC x QS) + TFC]** |

|  |  |
| --- | --- |
| **Profit =** | (1 853 **(1 950 x 0.95)** x 5 500 **(5 000 x 1.10)**) – [(980 x 5 500 **(5 000 x 1.10**)) +  1 930 000] |

|  |  |
| --- | --- |
| **Profit =** | 10 191 500 – 7 320 000 |

|  |  |
| --- | --- |
| **Profit =** | **$2 871 500** |

|  |
| --- |
| **Production Manager’s Proposal** |

|  |  |
| --- | --- |
| **Profit =** | **(SP x QS) – [(VC x QS) + TFC]** |

|  |  |
| --- | --- |
| **Profit =** | (1 853 **(1 950 x 0.95)** x 5 500 **(5 000 x 1.10)**) – [(931 **(980 x 0.95)** x 5 500 **(5 000 x 1.10)**) + 1 767 000 **(1 860 000** **x 0.95)**] |

|  |  |
| --- | --- |
| **Profit =** | 10 191 500 – 6 887 500 |

|  |  |
| --- | --- |
| **Profit =** | **$3 304 000** |

|  |
| --- |
| The Managing Directors wish to achieve a 5% increase in profits for the forthcoming financial year, means the profit would have to be sitting at a minimum of $3 139 500. The Marketing Manager’s Proposal does not meet this figure, sitting at $2 868 750, while the Production Manager’s Proposal is above it at $3 304 00. |

**Question 5.9**

**Requirement A**

|  |  |
| --- | --- |
| **Break-Even Point =** | **Total Fixed Costs** |
| **Contribution Margin** |

|  |  |
| --- | --- |
| **0 =** | 200 000 |
| Contribution Margin |

|  |  |
| --- | --- |
| **Contribution Margin =** | 200 000 - 0 |

|  |  |
| --- | --- |
| **Contribution Margin =** | 200 000 |

**Requirement B**

|  |  |
| --- | --- |
| **Contribution Margin =** | **Total Sales – Variable Costs** |

|  |  |
| --- | --- |
| **200 000 =** | 500 000 – Variable Costs |

|  |  |
| --- | --- |
| **Variable Costs =** | 500 000 – 200 000 |

|  |  |
| --- | --- |
| **Variable Costs =** | **$300 000** |

|  |  |
| --- | --- |
| **Number of Units Produced =** | **Variable Costs (In Total)** |
| **Variable Costs (Per Unit)** |

|  |  |
| --- | --- |
| **Number of Units Produced =** | 300 000 |
| 6 |

|  |  |
| --- | --- |
| **Number of Units Produced =** | 50 000 |

|  |  |
| --- | --- |
| **Sales Price Per Unit =** | **Total Sales** |
| **Number of Units Produced** |

|  |  |
| --- | --- |
| **Sales Price Per Unit =** | 500 000 |
| 50 000 |

|  |  |
| --- | --- |
| **Sales Price Per Unit =** | $10.00 |

**Requirement C**

|  |  |
| --- | --- |
| **Profit =** | **(SP x QS) – [(VC x QS) + TFC]** |

|  |  |
| --- | --- |
| **Profit =** | (10 x 55 000) – [(6 x 55 000) + 200 000] |

|  |  |
| --- | --- |
| **Profit =** | 550 000 – 530 000 |

|  |  |
| --- | --- |
| **Profit =** | $20 000 |

**Question 5.11**

**Requirement A**

|  |  |
| --- | --- |
| **Contribution Margin =** | **SP Per Unit – VC Per Unit** |

|  |  |
| --- | --- |
| **Contribution Margin (Per Unit) =** | 2 000 – 1 140 (**400 + 40 + 500 + 200**) |

|  |  |
| --- | --- |
| **Contribution Margin (Per Unit) =** | **$860** |

|  |  |
| --- | --- |
| **Contribution Margin (In Total) =** | 860 x 600 |

|  |  |
| --- | --- |
| **Contribution Margin (In Total) =** | **$516 000** |

**Requirement B**

|  |  |
| --- | --- |
| **Break-Even Point =** | **TFC** |
| **Contribution Margin** |

|  |  |
| --- | --- |
| **Break-Even Point =** | 200 000 |
| 860 |

|  |  |
| --- | --- |
| **Break-Even Point =** | **233 Subscriptions Or 233 x $2 000 = $466 000 Sales Dollars** |

**Requirement C**

|  |  |
| --- | --- |
| **Profit =** | **(SP x QS) – [(VC x QS) + TFC]** |

|  |  |
| --- | --- |
| **Profit =** | (2 000 x 600) – [(1 140 x 600) + 200 000] |

|  |  |
| --- | --- |
| **Profit =** | 1 200 000 – 884 000 |

|  |  |
| --- | --- |
| **Profit =** | **$316 000** |

**Requirement D**

|  |  |
| --- | --- |
| **Contribution Margin Ratio =** | **Contribution Margin Per Unit** |
| **Selling Price Per Unit** |

|  |  |
| --- | --- |
| **Contribution Margin Ratio =** | 860 |
| 2 000 |

|  |  |
| --- | --- |
| **Contribution Margin Ratio =** | 0.43 x 100 |

|  |  |
| --- | --- |
| **Contribution Margin Ratio =** | **43%** |

**Requirement E**

|  |  |
| --- | --- |
| **Number of Units (Using Target Sales Figure) =** | **Target Sales Figure** |
| **Selling Price Per Unit** |

|  |  |
| --- | --- |
| **Number of Units (Using Target Sales Figure) =** | 1 400 000 |
| 2 000 |

|  |  |
| --- | --- |
| **Number of Units (Using Target Sales Figure) =** | **700** |

|  |  |
| --- | --- |
| **Profit =** | **(SP x QS) – [(VC x QS) + TFC]** |

|  |  |
| --- | --- |
| **Profit =** | (2 000 x 700) – [(1 140 x 700) + 200 000] |

|  |  |
| --- | --- |
| **Profit =** | 1 400 000 – 998 000 |

|  |  |
| --- | --- |
| **Profit =** | **$402 000** |

|  |
| --- |
| The profit would increase by $86 000, which is an increase of 27.2% (402 000/316 000). |

**Requirement F**

|  |
| --- |
| **Marketing Manager’s Proposal** |

|  |  |
| --- | --- |
| **Contribution Margin =** | **SP Per Unit – VC Per Unit** |

|  |  |
| --- | --- |
| **Contribution Margin (Per Unit) =** | 1 800 (**2 000 x 0.9**) – 1 140 (**400 + 40 + 500 + 200**) |

|  |  |
| --- | --- |
| **Contribution Margin (Per Unit) =** | **$660** |

|  |  |
| --- | --- |
| **Break-Even Point =** | **TFC** |
| **Contribution Margin** |

|  |  |
| --- | --- |
| **Break-Even Point =** | 250 000 |
| 660 |

|  |  |
| --- | --- |
| **Break-Even Point =** | **379 Subscriptions** |

|  |  |
| --- | --- |
| **Profit =** | **(SP x QS) – [(VC x QS) + TFC]** |

|  |  |
| --- | --- |
| 316 000 **=** | (1 800 x **QS**) – [(1 140 x **QS**) + 250 000] |

|  |  |
| --- | --- |
| **QS =** | (316 000 + 250 000)/(1 800 – 1 140) |

|  |  |
| --- | --- |
| **QS =** | 566 000/660 |

|  |  |
| --- | --- |
| **QS =** | **858 Subscriptions** |

|  |
| --- |
| The Marketing Manager’s proposal would require the business to increase it’s sales by 258 subscriptions, or 43% (858/600), which is a huge jump in the sales of subscriptions, and seems a little unrealistic. |

**Requirement G**

|  |
| --- |
| **Facilities Manager Proposal** |

|  |  |
| --- | --- |
| **Profit (Current) =** | **(SP x QS) – [(VC x QS) + TFC]** |

|  |  |
| --- | --- |
| 316 000 **=** | (**SP** x 660 (**600 x 1.1**) – [(1 120 (**380** (**400 x 0.95**) **+ 40 + 500 + 200**) x 660 (**600 x 1.1**) + 180 000 (**200 000 x 0.9**)) |

|  |  |
| --- | --- |
| 316 000 **=** | (**SP** x 660) – [(1 120 x 660) + 180 000] |

|  |  |
| --- | --- |
| 316 000 **=** | (**SP** x 660) – [739 200 + 180 000] |

|  |  |
| --- | --- |
| 316 000 **=** | (**SP** x 660) – 919 200 |

|  |  |
| --- | --- |
| **SP** **=** | (316 000 + 919 200)/660 |

|  |  |
| --- | --- |
| **SP** **=** | 1 235 200/660 |

|  |  |
| --- | --- |
| **SP** **=** | **$1 872** |

|  |  |
| --- | --- |
| **Profit (Increase by 10%) =** | **(SP x QS) – [(VC x QS) + TFC]** |

|  |  |
| --- | --- |
| 347 600 (**316 000 x 1.1**) **=** | (**SP** x 660 (**600 x 1.1**) – [(1 120 (**380** (**400 x .95**) **+ 40 + 500 + 200**) x 660 (**600 x 1.1**) + 180 000 (**200 000 x 0.9**)) |

|  |  |
| --- | --- |
| 347 600 **=** | (**SP** x 660) – [(1 120 x 660) + 180 000] |

|  |  |
| --- | --- |
| 347 600 **=** | (**SP** x 660) – [739 200 + 180 000] |

|  |  |
| --- | --- |
| 347 600 **=** | (**SP** x 660) – 919 200 |

|  |  |
| --- | --- |
| **SP** **=** | (347 600 + 919 200)/660 |

|  |  |
| --- | --- |
| **SP** **=** | 1 266 800/660 |

|  |  |
| --- | --- |
| **SP** **=** | **$1 920** |

**Requirement H**

|  |  |
| --- | --- |
| **Margin of Safety =** | **Actual or Budgeted Sales – Break-Even Sales** |

|  |  |
| --- | --- |
| **Margin of Safety =** | 1 200 000 (**2 000 x 600**) – 466 000 |

|  |  |
| --- | --- |
| **Margin of Safety =** | **$734 000** |

|  |  |
| --- | --- |
| **Margin of Safety Percentage =** | **Margin of Safety** |
| **Actual or Budgeted Sales** |

|  |  |
| --- | --- |
| **Margin of Safety Percentage =** | 734 000 |
| 1 200 000 |

|  |  |
| --- | --- |
| **Margin of Safety Percentage =** | **61.2%** |

**Question 5.13**

**Requirement A, Part 1**

|  |  |
| --- | --- |
| **Contribution Margin =** | **SP Per Unit – VC Per Unit** |

|  |  |
| --- | --- |
| **Contribution Margin =** | 240 - 120 |

|  |  |
| --- | --- |
| **Contribution Margin =** | **$120** |

|  |  |
| --- | --- |
| **Break-Even Point =** | **TFC** |
| **Contribution Margin** |

|  |  |
| --- | --- |
| **Break-Even Point =** | 36 000 |
| 120 |

|  |  |
| --- | --- |
| **Break-Even Point =** | **300 Washing Machines Or 300 x $240 = $72 000 in Total Sales** |

**Requirement A, Part 2**

|  |  |
| --- | --- |
| **Profit =** | **(SP x QS) – [(VC x QS) + TFC]** |

|  |  |
| --- | --- |
| **Profit =** | (240 x 1 000) – [(120 x 1 000) + 36 000] |

|  |  |
| --- | --- |
| **Profit =** | 240 000 – 156 000 |

|  |  |
| --- | --- |
| **Profit =** | **$84 000** |

**Requirement A, Part 3**

|  |  |
| --- | --- |
| **Profit =** | **(SP x QS) – [(VC x QS) + TFC]** |

|  |  |
| --- | --- |
| **Profit =** | (240 x 800) – [(120 x 800) + 36 000] |

|  |  |
| --- | --- |
| **Profit =** | 192 000 – 132 000 |

|  |  |
| --- | --- |
| **Profit =** | **$60 000** |

**Requirement B**

|  |  |
| --- | --- |
| **Contribution Margin =** | **SP Per Unit – VC Per Unit** |

|  |  |
| --- | --- |
| **Contribution Margin =** | 240 – 148 (**40 x 1.2**) + (**8 + 2**) **x 10**) |

|  |  |
| --- | --- |
| **Contribution Margin =** | **$92** |

|  |  |
| --- | --- |
| **Break-Even Point =** | **TFC** |
| **Contribution Margin** |

|  |  |
| --- | --- |
| **Break-Even Point =** | 24 000 |
| 92 |

|  |  |
| --- | --- |
| **Break-Even Point =** | **261 Washing Machines Or 261 x $240 = $62 640 in Total Sales** |

|  |  |
| --- | --- |
| **Profit =** | **(SP x QS) – [(VC x QS) + TFC]** |

|  |  |
| --- | --- |
| **Profit =** | (240 x 800) – [(148 x 800) + 24 000] |

|  |  |
| --- | --- |
| **Profit =** | 192 000 – 142 400 |

|  |  |
| --- | --- |
| **Profit =** | **$49 600** |

**Requirement C**

|  |  |
| --- | --- |
| **Margin of Safety =** | **Actual or Budgeted Sales – Break-Even Sales** |

|  |  |
| --- | --- |
| **Margin of Safety =** | 240 000 – 72 000 |

|  |  |
| --- | --- |
| **Margin of Safety =** | **$168 000** |

|  |  |
| --- | --- |
| **Margin of Safety Percentage =** | **Margin of Safety** |
| **Actual or Budgeted Sales** |

|  |  |
| --- | --- |
| **Margin of Safety Percentage =** | 168 000 |
| 240 000 |

|  |  |
| --- | --- |
| **Margin of Safety Percentage =** | **70%** |

**Question 5.17**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Make** | **Buy** | **Net Profit Increase/Decrease** |
| **Direct Materials** | 6 000 x 80 = 480 000 | - | 480 000 |
| **Direct Labour** | 6 000 x 30 = 180 000 | - | 180 000 |
| **Variable Overhead** | 6 000 x 55 (**50 + 5**) = 330 000 | - | 330 000 |
| **Fixed Overhead** | 50 000 + 10 000 + 30 000 = 90 000 | - | 90 000 |
| **Purchase Price** | - | 6 000 x 300 = 1 800 000 | (1 800 000) |
| **Total Annual Cost** | **$1 080 000** | **$1 800 000** | **(720 000)** |

**Question 5.18**

|  |  |  |  |
| --- | --- | --- | --- |
| **Details** | **Perth Branch**  **$** | **Hobart Branch**  **$** | **Total**  **$** |
| **Sales** | 600 000 | 800 000 | 1 400 000 |
| **Variable Costs:** |  |  |  |
| **Manufacturing** | (241 000) | (378 500) | (619 500) |
| **Selling** | (47 600) | (56 700) | (104 300) |
| **Fixed Costs** | (251 500) | (249 500) | (501 000) |
| **Profit (Loss)** | **59 900** | **115 300** | **175 200** |

|  |
| --- |
| The business should not close down the Adelaide branch as the profit will drop from $299 300 to $175 200, which is a total of $124 100. |

**Question 5.19**

**Requirement A**

|  |  |
| --- | --- |
| **Total Sales =** | 4 000 Units + 3 000 Units |

|  |  |
| --- | --- |
| **Total Sales =** | **7 000 Units** |

|  |  |  |  |
| --- | --- | --- | --- |
| **Sales Mix** | | | |
| **Bedside Lamp** | **Number of Units Sold of a Given Product** | 4 000 | = **57%** |
| **Total Units Sold of All Products** | 7 000 |
| **Standard Lounge Room Lamp** | **Number of Units Sold of a Given Product** | 3 000 | = **43%** |
| **Total Units Sold of All Products** | 7 000 |

**Requirement B**

|  |  |
| --- | --- |
| **Contribution Margin (Bedside Lamp) =** | **SP Per Unit – VC Per Unit** |

|  |  |
| --- | --- |
| **Contribution Margin (Bedside Lamp) =** | 90 – 60 (30 + 10 + 20) |

|  |  |
| --- | --- |
| **Contribution Margin (Bedside Lamp) =** | **$30** |

|  |  |
| --- | --- |
| **Contribution Margin (Standard Lounge Room Lamp) =** | **SP Per Unit – VC Per Unit** |

|  |  |
| --- | --- |
| **Contribution Margin (Standard Lounge Room Lamp) =** | 120 – 85 (40 + 15 + 30) |

|  |  |
| --- | --- |
| **Contribution Margin (Standard Lounge Room Lamp) =** | **$35** |

|  |  |
| --- | --- |
| **Weighted Contribution Margin (Bedside Lamp) =** | **Contribution Margin x Sales Mix Proportion** |

|  |  |
| --- | --- |
| **Weighted Contribution Margin (Bedside Lamp) =** | 30 x 0.57 |

|  |  |
| --- | --- |
| **Weighted Contribution Margin (Bedside Lamp) =** | **$17** |

|  |  |
| --- | --- |
| **Weighted Contribution Margin (Standard Lounge Room Lamp) =** | **Contribution Margin x Sales Mix Proportion** |

|  |  |
| --- | --- |
| **Weighted Contribution Margin (Standard Lounge Room Lamp) =** | 35 x 0.43 |

|  |  |
| --- | --- |
| **Weighted Contribution Margin (Standard Lounge Room Lamp) =** | **$15** |

|  |  |
| --- | --- |
| **Weighted Average Contribution Margin =** | **Weighted Contribution Margin (Bedside Lamp) + Weighted Contribution Margin (Standard Lounge Room Lamp)** |

|  |  |
| --- | --- |
| **Weighted Average Contribution Margin =** | 17 + 15 |

|  |  |
| --- | --- |
| **Weighted Average Contribution Margin =** | **$32** |

**Requirement C**

|  |  |
| --- | --- |
| **Break-Even Point (In Units) =** | **TFC** |
| **Weighted Average Contribution Margin** |

|  |  |
| --- | --- |
| **Break-Even Point (In Units) =** | 205 000 **(120 000 + 85 000)** |
| 32 |

|  |  |
| --- | --- |
| **Break-Even Point (In Units) =** | **6 407 Units** |

**Requirement D**

|  |  |  |
| --- | --- | --- |
|  | **Bedside Lamp** | **Standard Lounge Room Lamp** |
| **Contribution Margin Per Unit** | 30 | 35 |
| **Hours To Produce One Unit** | 1 | 1.5 |
| **Contribution Margin Per Machine Hour** | **$30** | **$24** |

**Requirement E**

|  |  |  |
| --- | --- | --- |
| **Machine Hours Needed to Produce the Anticipated Sales Volume** | | |
| **Bedside Lamp** | 4 000 Units x 1 Hour | 4 000 Hours |
| **Standard Lounge Room Lamp** | 3 000 Units x 1.5 Hours | 4 500 Hours |
| **Total Machine Hours Needed** | | **8 500 Hours** |

|  |
| --- |
| As the bedside lamp has a higher contribution margin per machine hour, this is the product to be produced. With the anticipated sales volume of the bedside lamp being 4 000, the maximum number of bedside lamps should be produced.  This will leave a balance of 3 000 machine hours being available to produce the standard lounge room lamp. The business will not be able to produce the full anticipated sales volume of standard lounge room lamps as this will require 4 500 hours (as calculated above). However, the business will be able to produce 2 000 standard lounge room lamps with the remaining 3 000 machine hours due to each lamp requiring 1.5 hours to be produced (3 000 divided by 1.5 = 2 000).  Therefore, total production will be 4 000 bedside lamps and 2 000 standard lounge room lamps. |

**Question 5.23**

**Requirement A**

|  |  |
| --- | --- |
| **Capacity of Snowflake Pty Ltd** | |
| **Total Capacity** | 6 000 |
| **Current Production** | 5 000 |
| **Spare Capacity** | **1 000** |
| **Special Order** | 1 000 |

|  |
| --- |
| The business has the capacity to produce the special order. |

|  |  |
| --- | --- |
| **Profit =** | **(SP x QS) – [(VC x QS) + TFC]** |

|  |  |
| --- | --- |
| **Profit (Special Order) =** | (350 x 1 000) – [(190 x 1 000) + 0] |

|  |  |
| --- | --- |
| **Profit (Special Order) =** | 350 000 – 190 000 |

|  |  |
| --- | --- |
| **Profit (Special Order) =** | **$160 000** |

|  |
| --- |
| The business would proceed with the special order as it will make an additional $160 000 profit. |

**Requirement B**

|  |  |
| --- | --- |
| **Profit =** | **(SP x QS) – [(VC x QS) + TFC]** |

|  |  |
| --- | --- |
| **Profit (Current Production Lost) =** | (450 x 1 000) – (210 x 1 000) |

|  |  |
| --- | --- |
| **Profit (Current Production Lost) =** | 450 000 – 210 000 |

|  |  |
| --- | --- |
| **Profit (Current Production Lost) =** | **$240 000** |

|  |  |
| --- | --- |
| **Profit =** | **(SP x QS) – [(VC x QS) + TFC]** |

|  |  |
| --- | --- |
| **Profit (Special Order) =** | (350 x 2 000) – (190 x 2 000) |

|  |  |
| --- | --- |
| **Profit (Special Order) =** | 700 000 – 380 000 |

|  |  |
| --- | --- |
| **Profit (Special Order) =** | **$320 000** |

|  |
| --- |
| If the special order was for 2 000 items, the offer would still be acceptable, as there would be an additional $80 000 profit being made. The other factors that would need to be considered in making this decision would include other qualitative issues, such as whether this decision will adversely affect customers, employees, or suppliers, as well as the potential retaliation from competitors and legal constraints. |

**Question 5.24**

**Requirement A**

|  |  |
| --- | --- |
| **Capacity of Raindrop Ltd** | |
| **Total Capacity** | 10 000 |
| **Current Production** | 9 000 |
| **Spare Capacity** | **1 000** |
| **Special Order** | 800 |

|  |
| --- |
| The business has the capacity to produce the special order. |

|  |  |
| --- | --- |
| **Profit =** | **(SP x QS) – [(VC x QS) + TFC]** |

|  |  |
| --- | --- |
| **Profit (Special Order) =** | (100 x 800) – [(85 (**25 + 20 + 40**) x 800) + 10 000] |

|  |  |
| --- | --- |
| **Profit (Special Order) =** | 80 000 – 78 000 |

|  |  |
| --- | --- |
| **Profit (Special Order) =** | **$2 000** |

|  |
| --- |
| The business should accept the special order, as it will bring in an additional $12 000 profit. |

**Requirement B**

|  |  |
| --- | --- |
| **Profit =** | **(SP x QS) – [(VC x QS) + TFC]** |

|  |  |
| --- | --- |
| **Profit (Current Production Lost) =** | (150 x 1 000) – (90 x 1 000) |

|  |  |
| --- | --- |
| **Profit (Current Production Lost) =** | 150 000 – 90 000 |

|  |  |
| --- | --- |
| **Profit (Current Production Lost) =** | **$60 000** |

|  |  |
| --- | --- |
| **Profit =** | **(SP x QS) – [(VC x QS) + TFC]** |

|  |  |
| --- | --- |
| **Profit (Special Order) =** | (100 x 2 000) – [(85 x 2 000) + 10 000] |

|  |  |
| --- | --- |
| **Profit (Special Order) =** | 200 000 – 180 000 |

|  |  |
| --- | --- |
| **Profit (Special Order) =** | **$20 000** |

|  |
| --- |
| The special order would not be acceptable, as the profit lost from the current production, of $60 000, is higher than the profit gained from the special order, of $20 000. |

**Question 5.25**

**Requirement A**

|  |  |
| --- | --- |
| **Profit =** | **(SP x QS) – [(VC x QS) + TFC]** |

|  |  |
| --- | --- |
| **Profit (Normal Production) =** | (200 x 100 000) – [(100 x 100 000) + 7 500 000] |

|  |  |
| --- | --- |
| **Profit (Normal Production) =** | 20 000 000 – 17 500 000 |

|  |  |
| --- | --- |
| **Profit (Normal Production) =** | **$2 500 000** |

**Requirement B**

|  |  |
| --- | --- |
| **Profit =** | **(SP x QS) – [(VC x QS) + TFC]** |

|  |  |
| --- | --- |
| **Profit (Reduced Selling Price) =** | (185 x 125 000 (**100 000/0.8**) – [(100 x 125 000(**100 000/0.8**) + 7 500 000] |

|  |  |
| --- | --- |
| **Profit (Reduced Selling Price) =** | 23 125 000 – 20 000 000 |

|  |  |
| --- | --- |
| **Profit (Reduced Selling Price) =** | **$3 125 000** |

|  |
| --- |
| The company will earn an extra $625 000 in profit, by reducing the selling price to $185 and increasing its operation to 100% capacity, and should go ahead with the reduced selling price. |

**Requirement C**

|  |  |
| --- | --- |
| **Profit =** | **(SP x QS) – [(VC x QS) + TFC]** |

|  |  |
| --- | --- |
| **Profit (Special Offer) =** | (175 x 20 000) – [(95 x 20 000) |

|  |  |
| --- | --- |
| **Profit (Special Offer) =** | 3 500 000 – 1 900 000 |

|  |  |
| --- | --- |
| **Profit (Special Offer) =** | **$1 600 000** |

|  |
| --- |
| If the company accepted the special offer, with the current production, they would earn a total profit of $4 100 000 ($2 500 000 + $1 600 000). Therefore, accepting the special offer with Low Price Stores would be the best option. |