**Cost Accounting for Decision-making**

**Home Assignment**

Suggested Solutions

**Question 1**

1. A relevant cost is a future cost that differs across options. (1 mark)

(bi) No, not agree. Only those future costs that will differ across options under consideration are relevant. (2 marks)

(bii) For example, if the factory signs a long-term lease agreement with the landlord, then the future rental fee will be an irrelevant cost because the amount of it remains unchanged across production options. (3 marks)

 (Total: 6 marks)

**Question 2**

1. Relevant costs include:

• Purchase price of Hilary’s bicycle (Avoidable cost)

 • Repair cost for Peter’s bicycle (Avoidable cost)

 • Annual operating costs for Hilary’s bicycle (Incremental cost)

 • Annual operating costs for Peter’s bicycle (Incremental cost)

Irrelevant cost:

 • Purchase price of Peter’s bicycle (Sunk cost)

 (1 mark each, total: 5)

1. No matter to repair or to purchase, Peter still needs to pay $300 in either case. Therefore it is more advisable for Peter to buy Hilary’s bicycle as he can save $40 ($160 - $120) operating costs per annum in future. (3 marks)

(c) Other factors that Peter needs to consider include:

1. Number of years that Hilary’s bicycle can ride before disposal.

2. Expected resale values of both bicycles.

3. Personal preference of Peter to ride on his own bike or Hilary’s one.

 (1 mark each, max: 2)

 (Total: 10 marks)

**Question 3**

1. In the view that fixed overheads are unavoidable, Fenny Company should not accept the offer because it can save $3\* per unit if the lenses are manufactured internally instead of making external direct purchase. (5 marks)

*\*Workings:*

|  |  |  |
| --- | --- | --- |
|  | *Make* | *Buy* |
|  | *$* | *$* |
| *Direct materials* | *8* |  |
| *Direct labor* | *9* |  |
| *Variable overhead* | *5* |  |
| *Purchase price* |  | *25* |
| *Total costs* | *22* | *25* |

(b) Since the incremental cost of using the production capacity of other type of lens is approximately $4 per unit (i.e. the fixed overheads), the maximum external acceptable purchase price would be $26 per unit. (3 marks)

 (Total: 8 marks)

**Question 4**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| (a) | **Component** | **A** | **B** | **C** | **Total** |
|  |  | ($000) | ($000) | ($000) | ($000) |
|  | Direct materials (15,000 x $60 / 30,000 x $75 / 60,000 x $30) | 900 | 2,250 | 1,800 | 4,950 |
|  | Direct labor (15,000 x $120 / 30,000 x $135 / 60,000 x $60) | 1,800 | 4,050 | 3,600 | 9,450 |
|  | Variable overhead (15,000 x $30 / 30,000 x $45 / 60,000 x $15) | 450 | 1,350 | 900 | 2,700 |
|  | Specific fixed overhead | 15 | 75 | 90 | 180 |
|  |  | 3,165 | 7,725 | 6,390 | 17,280 |
|  | General fixed overhead |  |  |  | 450 |
|  | Total manufacturing costs |  |  |  | 17,730 |

 (6 marks)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| (b) | **Component** | **A** | **B** | **C** | **Total** |
|  |  | ($000) | ($000) | ($000) | ($000) |
|  | Payment to the supplier (15,000 x $90 / 30,000 x $315 / 60,000 x $150) | 1,350 | 9,450 | 9,000 | 19,800 |
|  | Additional carriage inward(15,000 x $1 / 30,000 x $1 / 60,000 x $1) | 15 | 30 | 60 | 105 |
|  | Additional indirect labor |  |  |  | 38 |
|  | General fixed cost ($450,000 - $280,000) |  |  |  | 170 |
|  | Total outsourcing costs |  |  |  | 20,113 |

 (5 marks)

(c) An extra cost of $2,383,000 ($20,113,000 - $17,730,000) would be incurred if all the components are outsourced, therefore the company should not do so. (3 marks)

(d) The manufacturing costs for A is $3,165,000 {15,000 x $(60 + 120 + 30) + $15,000}, which is greater than the outsourcing costs of $1,365,000 {15,000 x $(90 +1)}, therefore the company should outsource A.

The manufacturing costs for B is $7,725,000 {30,000 x $(75 + 135 + 45) + $75,000}, which is less than the outsourcing costs of $9,480,000 {30,000 x $(315 +1)}, therefore the company should produce B.

The manufacturing costs for C is $6,390,000 {60,000 x $(30 + 60 + 15) + $90,000}, which is less than the outsourcing costs of $9,060,000 {60,000 x $(150 +1)}, therefore the company should produce C.

If the company wants to maximize the profit, the company should outsource A and produce B and C, and the total costs will be $15,968,000 as shown below:

|  |  |
| --- | --- |
|  | $’000 |
| Purchase price for A (15,000 x $90) | 1,350 |
| Manufacturing costs for B and C {30,000 x $(75 + 135 + 45) + 60,000 x $(30 + 60 + 15) + $75,000 +$90,000} | 14,115 |
| General fixed cost | 450 |
| Additional carriage inward (15,000 x $1) | 15 |
| Additional indirect labor | 38 |
| Total costs | 15,968 |

 (6 marks)

(e) Qualitative factors which would influence the decision to make or buy are:

1. Dependability of suppliers: Whether the external supplier can be relied upon for the delivery of goods at a specified time.
2. Availability of resources: Whether there is any limitation on the company to have access to the available resources to make the components intenally.
3. Quality control of purchased goods: Whether it would be difficult for the company to have control over the quality of the goods purchased.
4. Technology and personnel: Whether the company has the required special technology and personnel to produce the components.
5. Trend of future costs of production: Whether the future costs of production of the component from the supplier would increase relative to the cost of production by the company.

 (5 marks)

 (Total: 25 marks)

**Question 5**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  (a) |  | A ($) | B ($) | C ($) | D ($) |
|  | Selling price | 15 | 18 | 10 | 4.5 |
|  | Direct materials | (4.5) | (3.5) | (2.5) | (0.8) |
|  | Direct labor | (6) | (8) | (4) | (1.6) |
|  | Variable manufacturing overheads (VOH) (W1) |   (1.2) | (1.6) | (0.8) | (0.32) |
|  | Contribution margin  | 3.3 | 4.9 | 2.7 | 1.78 |
|  |  |  |  |  |  |
|  | Contribution margin per DLH  | 22 | 24.5 | 27 | 44.5 |
|  | ***Ranking*** | ***4*** | ***3*** | ***2*** | ***1*** |
|  |  |  |  |  | (6 marks)  |
|  |  |  |  |  |  |
|  | (W1)  | Direct labor required for A: $6 / $40 = 0.15 per unit |  |  |  |  |
|  |  | Direct labor required for B: $8 / $40 = 0.2 per unit |  |  |  |  |
|  |  | Direct labor required for C: $4 / $40 = 0.1 per unit |  |  |  |  |
|  |  | Direct labor required for D: $6 / $40 = 0.04 per unit |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  | VOH for A = $8 x 0.15 = $1.2 |  |  |  |  |
|  |  | VOH for B = $8 x 0.2 = $1.6 |  |  |  |  |
|  |  | VOH for C = $8 x 0.1 = $0.8 |  |  |  |  |
|  |  | VOH for D = $8 x 0.04 = $0.32 |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| (b) | Product | Hour required / unit | Units | Hours |
|  | D  | 0.04 | hour | 125,000 | 5,000 |
|  | C  | 0.1 | hour | 24,000 | 2,400 |
|  | B  | 0.2 | hour | 10,000 | 2,000 |
|  | A  | 0.15 | hour | 8,000 |  1,200 |
|  | Total hours required |  |  |  | 10,600 |

The company does not have enough production capacity to fulfil the expected sales since the total number of hours required for producing all the four products is 10,600, while the production capacity of the compant is only 10,000 hours.

To maximize its profits, the company should produce 125,000 units (5,000 hours) of D, 24,000 units (2,400 hours) of C, 10,000 units (2,000 hours) of B, and 4,000 units (10,000 – 5,000 – 2,400 – 2,000 = 600 hours) of A. (4 marks)

(c) Because the additional capacity would be used to produce A, the company should be willing to pay up to $66 per hour ($40 usual rate plus $22 contribution margin per hour for A) for additional labor time. (2 marks)

(d) The company may consider to ask the labor to work overtime; add another shift; expand the workforce; outsource part of the work to external suppliers; and eliminate wasted labor time in the production process etc. (3 marks)

 (Total: 15 marks)

**Question 6**

1. This order will consume 720 {6 x (6000 / 50)} machine hours per month for three months. Since there is excess capacity of 1,000 {5,000 × (100% − 80%)} machine hours per month, Shiny Company can accept this order without expanding its current capacity. (3 marks)
2. The company only has to charge the incremental variable costs per box for this order because it has enough capacity to handle this order.

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  $ |  |
|  | Direct material | 5 |  |
|  | Direct labor | 7 |  |
|  | Variable manufacturing overhead | 4 |  |
|  | Additional cost of repacking |  1 |  |
|  | Minimum price to be charged for this order | 17 |  |

Therefore, the minimum price for this order is $17 per box. (5 marks)

1. Factors that the company should consider before making a final decision:
* The company should determine whether the estimate costs are accurate as they are average costs in the past only.
* The company should also consider how its regular customers might react to the lower price offered to the retail shop.

(2 marks)

 (Total: 10 marks)

**Question 7**

(a) Impact of dropping Model 003 on operating income:

|  |  |  |
| --- | --- | --- |
|  |  | $’000 |
|  | Reduction in contribution margin:  |  |
|  |  Model 003 | (70) |
|  |  Model 002 | (12.5) |
|  | Cost savings: |  |
|  |  Utilities expense | 50 |
|  |  Wages and salaries | 28 |
|  |  Advertising expense | 11 |
|  | Increase in operating income | 6.5 |

Therefore, Model 003 should be dropped because the company can increase the income by $6,500. (6 marks)

(b) Impact of increasing advertising expense on operating income:

|  |  |  |
| --- | --- | --- |
|  |  | $’000 |
|  | Increase in contribution margin ($70,000 x 50%) | 35 |
|  | Increase in advertising expense | (32) |
|  | Increase in operating income | 3 |

From (a), if the company drops Model 003, the operating profit will be increased by $6,500. From (b), if the company increases the advertising expense on Model 003, the operating profit will be increased by $3,000. As a conclusion, the company still should drop Model 003.

($6,500 > $3,000 by $2,500) (6 marks)

 (Total: 12 marks)

**Question 8**

|  |  |  |
| --- | --- | --- |
| (a) | If the company purchases the new machine and disposes the old one: |  |
|  |  |  $ |
|  | Difference in disposal value at the end of 5 years ($60,000 - $3,000) | 57,000 |
|  | Decrease in annual operating costs {5 × $(50,000 – 35,000) | 75,000 |
|  | Decrease in rework cost (160,000 x 0.02 x $0.5 x 5) | 8,000 |
|  | Disposal value of the old machine at present | 40,000 |
|  | Purchase cost for new machine | (170,000) |
|  | Net benefit | 10,000 |

Pleasure Company should replace the old machine with the new one because it can gain a net benefit of $10,000. (7 marks)

1. The purchase cost of the old machine is a sunk cost. (1 mark)
2. Other factors need to consider:
3. Will sales be increased because of a lower defective rate after using the new machine?
4. Does the company have enough cash to purchase the new machine? (2 marks)

 (Total: 10 marks)

**Question 9**

|  |  |
| --- | --- |
|  |  $ |
| Sales value after further procession ($23 x 450) | 10,350 |
| Sales value at present ($15 x 500) | (7,500) |
| Incremental revenue | 2,850 |
| Further processing cost | (2,600) |
| Net benefit  | 250 |
|  |  |

The company should further process C03 into D04 as the net benefit is $250 for each ton of cotton. The allocated cost of $80,000 is not relevant in this decision. (5 marks)

 (Total: 5 marks)

**Question 10**

|  |  |  |  |
| --- | --- | --- | --- |
| (a) |  |  $ |  |
|  | Material X (Irrelevant cost) | 0 |  |
|  | Material Y | 90,000 |  |
|  | Direct labor | 80,000 |  |
|  | Net cost of machinery ($100,000 - $40,000) | 60,000 |  |
|  | Total relevant costs  | 230,000 |  |
|  | Contract price | 350,000 |  |
|  | Contribution | 120,000 | (8 marks) |

1. The sales manager should go ahead to tender this project because the company can earn $120,000 more of profit with the tender price at $350,000. (2 marks)

|  |  |
| --- | --- |
| (c) | The sales manager should not take the advice from the production managers to set the tender price at $350,000 because:1. The costs calculated in (a) do not represent incremental cash flows arising from undertaking the contract.
2. Assume the company has enough capacity, supervision costs and overheads are irrelevant for determining the contribution for the project
3. Any sales revenue in excess of $230,000 will provide an additional contribution which will result in an increase in profits.
4. The competitor is prepared to accept the order at $250,000, then a tender price slightly below $250,000 would be appropriate.
5. If the tender price is set at $250,000, then there is still a profit of $20,000 ($250,000 - $230,000) from the project.
 |
|  |  | (2 marks each, max: 6 marks) |
| (d) | Before accepting the project, the following qualitative factors should be considered. |  |
|  | (i) | Is there sufficient spare capacity to undertake the project? |  |
|  | (ii) | Is the oversea customer credit worthy? |  |
|  | (iii) | Does the workforce have the necessary skills to undertake the project? |  |
|  | (iv)  | Is the contract likely to result in repeat sales from the oversea customer? |  |

 (4 marks)

 (Total: 20 marks)