# Chapter 20 Absorption and marginal costing

## Absorption costing (吸收成本法)

將成本分為，**製造**和**非製造成本** (**manufacturing and non-manufacturing costs**)。所有製造成本，無論是固定還是可變，被視為製造成本(manufacturing costs)。所有非生產成本被視為非製造成本 (non-manufacturing costs)。製造成本被分為**直接**(**direct**)和**間接**(**indirect**)的製造成本(manufacturing costs)。根據吸收成本法，商品的生產成本必須包括所有的製造成本，不論他們是否固定和變動。

## Income Statements under absorption costing (根據吸收成本法編製損益表)

**Income statement for the month ended 31 January 2011**

| | | $ | $ |
|---|---|---|---|
| Sales | | | 88,000 |
| Less: | Cost of goods sold | | |
| | Opening inventory | 10,000 | |
| | Direct material cost | 27,000 | |
| | Direct labour cost | 18,000 | |
| | Variable production overheads | 13,500 | |
| | Fixed production overheads | 11,250 | |
| | | 79,750 | |
| | **Less: Closing inventory [($69,750 / 2,250) x 250]** | **(7,750)** | (72,000) |
| Gross profit | | | 16,000 |
| Less: | Variable non-production overheads | | (8,000) |
| | Fixed non-production overheads | | (3,000) |
| Net profit | | | 5,000 |

**Total production cost $69,750**

**Production unit** **Closing inventory unit**

根據吸收成本法，**存貨的價值必須包括所有的製造成本**，不論他們是否固定和變動。因為要將固定製造費用化為吸收製造成本，我們需要利用數學運算，計出商品的製造成本。

**Classwork 1**

You are given the following information about CD Ltd, a manufacturer, for the years ended 31 December 2016:

| | | |
|---|---|---|
| Opening inventory | 10,000 units | $200,000 |
| Sales | 80,000 units | |
| Production | 100,000 units | |
| Direct materials | $5 per unit | |
| Direct labour | $4 per unit | |
| Selling price | $30 per unit | |
| Manufacturing overheads: Variable | $10 per unit | |
| Fixed | $100,000 per annum | |
| Non-manufacturing overheads: Variable | $1 per unit sold | |
| Fixed | $50,000 per annum | |

***Required:*** Prepare income statements for the years ended 31 December 2016 under absorption costing.

**Income Statement for the year ended 31 December 2016**

| | | | |
|---|---|---|---|
| | $ | | $ |
| Sales (80,000 × $30) | | | 2,400,000 |
| *Less Cost of goods sold:* | | | |
| Opening inventory | 200,000 | | |
| Direct materials (100,000 x $5) | 500,000 | | |
| Direct labour (100,000 x $4) | 400,000 | | |
| Manufacturing overheads: Variable (100,000 x $10) | 1,000,000 | | |
| Manufacturing overheads: fixed | 100,000 | | |
| | 2,200,000 | | |
| *Less* Closing inventory [($2,000,000 / 100,000) x 30,000] | 600,000 | | 1,600,000 |
| Gross profit | | | 800,000 |
| *Less* Variable non-manufacturing overheads (80,000 × $1) | | | 80,000 |
| Fixed non-manufacturing overheads | | | 50,000 |
| Net profit | | | 670,000 |

**HKDSE Sample 2 (Paper 2A, 2)** **(Absorption and marginal Costing)**

Perry Ltd started producing Product A on 1 January 2012. The unit selling price and cost of Product A for the month of January 2012 were as follows:

| | ($/unit) |
|---|---|
| Selling price | 5.90 |
| Direct material | 1.20 |
| Direct labour | 1.40 |
| Variable production overheads | 0.70 |
| Variable selling and administrative expenses | 0.15 |

(i) Fixed production overheads were budgeted at $308,000 per month and were absorbed based on the number of units produced. Actual fixed production overheads of Product A were the same as the absorbed fixed production overheads for the month.

(ii) Budgeted production and budgeted sales were the same at 280,000 units per month.

(iii) Actual production and actual sales of Product A for the month were 250,000 units and 220,000 units respectively.

(iv) Actual fixed selling and administrative expenses were $110,000.

(v) There were no closing direct materials and work-in-progress inventories of Product A as at 31 January 2012.

**REQUIRED:**

Prepare the income statement for the month ended 31 January 2012 using absorption costing.

**Perry Ltd**
**Income Statement for the month ended 31 January 2012 using absorption costing**

| | $ | | $ |
|---|---|---|---|
| Sales (220,000 × $5.90) | | | 1,298,000 |
| Less: Cost of goods sold: | | | |
| Direct materials (250,000 × $1.20) | 300,000 | | |
| Direct labour (250,000 × $1.40) | 350,000 | | |
| Variable production overheads (250,000 × $0.70) | 175,000 | | |
| Fixed production overheads absorbed (250,000 × $1.1) | 275,000 | | |
| | 1,100,000 | | |
| Less: Closing inventory [(250,000 – 220,000) x $4.4] | 132,000 | | 968,000 |
| Gross profit | | | 330,000 |
| Less: Variable selling and administrative expenses (220,000 x $0.15) | 33,000 | | |
| Fixed selling and administrative expenses | 110,000 | | 143,000 |
| Net profit | | | 187,000 |

Unit fixed production overheads absorbed = $308,000 ÷ 280,000 = $1.1

Unit production costs under absorption costing

= ($1.20 + $1.40 + $0.70 + $1.1) or ($1,100,000 ÷ 250,000) = $4.4

## Marginal costing (邊際成本法)

將成本分為，固定和變動成本 **(fixed and variable costs)**。

## Income Statements under marginal costing (根據邊際成本法編製損益表)

**Income statement for the month ended 31 January 2011**

| | | $ | $ |
|---|---|---|---|
| Sales | | | 88,000 |
| Less: Variable cost of goods sold | | | |
| Opening inventory | | 10,000 | |
| Direct material cost | | 27,000 | |
| Direct labour cost | **Total variable production cost $58,500** | 18,000 | |
| Variable production overheads | | 13,500 | |
| | | 68,500 | |
| **Less: Closing inventory [$58,500 / 2,250) x 250]** | | (6,500) | 62,500 |
| Product contribution margin | | | 26,000 |
| Less: Variable non-production overheads | | | (8,000) |
| Contribution | | | 18,000 |
| Less: Fixed production overheads | | 11,250 | |
| Fixed non-production overheads | | 3,000 | 14,250 |
| Net profit | | | 3,750 |

**Production unit** **Closing inventory unit**

- 存貨價值只包括變動製造成本。
- 產品邊際貢獻 **(Product contribution margin)** 是指已售出商品的銷售收入超出已售出商品的變動製造成本。
- 總邊際貢獻 **(Total contribution margin)** 是指已售出商品的銷售收入超出已售出商品的總變動成本。

### Classwork 2

You are given the following information about CD Ltd, a manufacturer, for the years ended 31 December 2016:

| | | |
|---|---|---|
| Opening inventory | 10,000 units | $200,000 |
| Sales | 80,000 units | |
| Production | 100,000 units | |
| Direct materials | $5 per unit | |
| Direct labour | $4 per unit | |
| Selling price | $30 per unit | |
| Manufacturing overheads: Variable | $10 per unit | |
| Fixed | $100,000 per annum | |
| Non-manufacturing overheads: Variable | $1 per unit sold | |
| Fixed | $50,000 per annum | |

***Required:***

Prepare income statements for the years ended 31 December 2016 under marginal costing.

**Income Statement for the year ended 31 December 2016**

| | $ | | $ |
|---|---|---|---|
| Sales (80,000 × $30) | | | 2,400,000 |
| *Less* *Cost of goods sold:* | | | |
| Opening inventory | 200,000 | | |
| Direct materials (100,000 x $5) | 500,000 | | |
| Direct labour (100,000 x $4) | 400,000 | | |
| Manufacturing overheads: Variable (100,000 x $10) | 1,000,000 | | |
| | 2,100,000 | | |
| *Less* Closing inventory [($1,900,000 / 100,000) x 30,000] | 570,000 | | 1,530,000 |
| Product contribution | | | 870,000 |
| *Less* Variable non-manufacturing overheads (80,000 × $1) | | | 80,000 |
| Total contribution | | | 790,000 |
| Less Fixed manufacturing overheads | 100,000 | | |
| Fixed non-manufacturing overheads | 50,000 | | 150,000 |
| Net profit | | | 640,000 |

**HKDSE (2012, 4)** **(Absorption and marginal Costing)**

Magic Company manufactures and sells a single product, Product X. For the purpose of preparing the budget for Product X for the month of November 2012, the following information is provided:

(i) The budgeted production and budgeted sales for the month are 5000 and 4400 units respectively.

(ii) The expected selling price is $300 per unit.

(iii) The direct material cost of the production is $40 per unit. An additional transportation cost of $2 per unit is to be incurred for the purchase of the direct materials.

(iv) Each unit of product requires 2 hours of direct labour. The hourly rate of direct labour is $60.5.

(v) The production overheads of the product comprise a fixed and a variable element. It is the company's policy to apportion variable production overheads in relation to the number of units produced.
Assuming the monthly fixed production overheads of the company remain the same in 2012, the annual budgeted production overheads will be $1 159 000 if 58 000 units are produced each year, and $1 203 000 if 66 000 units are produced each year.

(vi) Selling and distribution expenses consist of a sales commission of $8 per unit sold and a fixed monthly distribution expense of $50 000.

**REQUIRED:**

Magic Company adopts the marginal costing system. Assume it does not keep any inventories as at 31 October 2012, prepare the following for Product X for the month ended 30 November 2012:

(a) the budgeted cost of goods manufactured (manufacturing account),

(b) the budgeted income statements

(a)

**Budgeted Manufacturing Account for the month ended 30 November 2012**

| | $ |
|---|---|
| Direct materials ($40 x 5,000) | 200,000 |
| Transportation cost on direct materials per unit ($2 x 5,000) | 10,000 |
| Direct labour cost per unit ($60.5 x 2 x 5,000) | 605,000 |
| Variable production overheads [($1,203,000 – $1,159,000) / (66,000 – 58,000) x 5,000] | 27,500 |
| Variable manufacturing cost of goods completed | 842,500 |

(b)

**Income Statement for the month ended 30 December 2012**

| | $ | | $ |
|---|---|---|---|
| Sales (4,400 × $300) | | | 1,320,000 |
| *Less* *Cost of goods sold:* | | | |
| *Add* Cost of goods manufactured | 842,500 | | |
| *Less* Closing inventory [($842,500 / 5,000) x 600] | 101,100 | | 741,400 |
| Product contribution margin | | | 578,600 |
| *Less* Variable non-manufacturing overheads (4,400 × $8) | | | 35,200 |
| Total contribution margin | | | 543,400 |
| *Less* Fixed production overhead ($1,159,000 – $5.5 x 58,000)/12 | 70,000 | | |
| Fixed non-manufacturing overheads | 50,000 | | 120,000 |
| Net profit | | | 423,400 |

# Absorption of manufacturing overheads (吸收製造費用)

## Overhead absorption rate (間接費用吸收率)

### Actual overhead absorption rate (實際間接費用吸收率)

Actual costing means that product costs are accounted for on the basis of actual costs incurred.

— This is known as actual manufacturing costing, where costs are accounted for on the basis of actual costs incurred. (這就是所謂的實際製造成本法，成本是以實際使用的基礎上計算。)

**Actual manufacturing overhead absorption rate**
**= Actual total manufacturing overhead ÷ Actual total quantity of the absorption base**
**(實際間接製造費用吸收率) = (實際總間接製造費用) ÷ (該生產部門或產品實際的吸收基礎總數量)**

**Manufacturing overheads absorbed = Actual quantity of the absorption base x Actual overhead absorption rate**
**(某一工作或產品吸收的間接製造費用) = (某一工作或產品的實際吸收基礎數量) x (實際間接製造費用吸收率)**

### Predetermined manufacturing overhead absorption rate (預定間接製造費用吸收率)

— Many businesses do not wait until all the manufacturing overheads are ascertained at the end of a year. (許多企業不能在年底等到所有製造費用確定。)

— They calculate a **predetermined manufacturing overhead absorption rate** at the **beginning** of a year. (他們只能計算預定間接製造費用吸收率)

**Predetermined manufacturing overhead absorption rate**
**= Budgeted total manufacturing overhead ÷ Budgeted total quantity of the absorption base**
**(預定間接製造費用吸收率) = (預算總間接製造費用) ÷ (該生產部門或產品預算的吸收基礎總數量)**

**Manufacturing overheads absorbed = Actual quantity of the absorption base x Predetermined overhead absorption rate**
**(某一工作或產品吸收的間接製造費用) = (某一工作或產品的實際吸收基礎數量) x (預定間接製造費用吸收率)**

**Example 1**

| | |
|---|---|
| Actual manufacturing overheads | $3,360,000 |
| Actual direct labour hours | 120,000 |
| Actual direct material | $2,000,000 |

If the absorption base of the manufacturing overhead is direct labour hours, calculate the overhead absorption rate.

**Answer:**

The manufacturing overhead absorption rate is = $3,360,000 / 120,000 = $28 per direct labour hour

**Classwork 1**

1 Winter Ltd calculates its overhead absorption rate annually on the basis of machine hours. For the year ended 31 December 2012, the total actual manufacturing overheads were $345,000 and the total actual machine hours were 25,000 hours.

(a) Calculate the actual overhead absorption rate for the year ended 31 December 2012.

(b) Calculate the manufacturing overheads absorbed of Job No. 100 for the year ended 31 December 2012 if the machine hours of the job No. 100 are 10,000 hours.

(a) Actual overhead absorption rate = $345,000 ÷ 25,000
= $13.8 per machine hour

(b) Manufacturing overheads absorbed of Job No. 100 = 10,000 × $13.8
= $138,000

2 The following data relate to Job No. QQ23 during a period:

| | |
|---|---|
| Opening work-in-progress | $32,720 |
| Direct materials added | $80,000 |
| Direct labour | $14,000 |
| Direct labour hours | 600 hours |
| Total manufacturing overheads | $123,000 |
| Total direct labour hours | 41,000 hours |

Manufacturing overheads were absorbed on the basis of direct labour hours.

(a) Calculate the manufacturing overhead absorption rate and the manufacturing overheads absorbed of Job No. QQ23.

(b) Determine the selling price of Job No. QQ23, assuming a mark-up of 40% is required.

(a) Manufacturing overhead absorption rate = $123,000 ÷ 41,000 = $3 per direct labour hour

Manufacturing overheads absorbed of QQ 23 = 600 × $3 = $1,800

(b) Total manufacturing costs = $32,720 + $80,000 + $14,000 + $1,800 = $128,520

Selling price for job No. QQ23 = $128,520 x (1 + 40%) = $179,928

3 Creative Ltd prints books, magazine and booklets in accordance with customers' requirements. Job No. 228 has been completed. The costs related to this job are as follows:

Direct materials:

| Type | Quantity | Price |
|---|---|---|
| Paper | 200,000 sheets | $40 per 1,000 sheets |
| Ink | 10 cartridges | $600 per cartridge |

Direct labour:

| Type | Hours | Hourly wage rate |
|---|---|---|
| Editing | 30 | $50 |
| Printing | 20 | $25 |

Production overheads were absorbed on the basis of total direct labour hours. The absorption rate was $8 per labour hour.

Administrative overheads were charged on the basis of 10% of total production costs.
The selling price for this job was quoted at $23,000.

(a) Calculate the total costs and the profit (or loss) for Job No. 228.

(a) Total production costs = (200,000 ÷ 1,000 × $40) + (10 × $600) + (30 × $50) + (20 × $25) + (50 × $8)
= $16,400

Administrative overheads = ($16,400 × 10%) = $1,640

Total costs = $16,400 + $1,640 = $18,040

Profit = $23,000 − $18,040 = $4,960

## Classwork 3

1 Winter Ltd calculates its predetermined overhead absorption rate annually on the basis of machine hours. The total budgeted manufacturing overheads were $345,000 and the total budgeted machine hours were 25,000 hours.

(a) Calculate the predetermined overhead absorption rate for the year ended 31 December 2012.

(b) Calculate the predetermined overheads absorbed of Job No. 100 for the year ended 31 December 2012 if the machine hours of the job No. 100 are 10,000 hours.

(a) Predetermined overhead absorption rate = $345,000 ÷ 25,000 hours = $13.8 per machine hour

(b) Predetermined overheads absorbed of Job No. 100 = 10,000 × $13.8
= $138,000

## Classwork 4

1 Data of a firm for the past period are as follows:

| | |
|---|---|
| Total machine hours | 8,000 |
| Number of material requisitions | 350 |
| Number of purchase orders | 200 |
| Number of production runs | 200 |

| Production overheads: | $ | Absorption base: |
|---|---|---|
| Short run variable costs | 560,000 | Machine hours |
| Production scheduling costs | 600,000 | Production runs |
| Stores receiving costs | 50,000 | Purchase orders executed |
| Materials handling costs | 70,000 | Requisitions raised |

(a) Calculate the production overhead absorption rate for each of the four production overheads activities.

(b) Assume 6,000 machine hours, 50 production runs, 100 purchase orders and 200 material requisitions were incurred on product P1, calculate the production overheads for P1.

(a) Overhead absorption rate for Short run = ($560,000 ÷ 8,000) = $70 per machine hour

Overhead absorption rate for Production scheduling = ($600,000 ÷ 200) = $3,000 per production runs

Overhead absorption rate for Stores receiving = ($50,000 ÷ 200) = $250 per purchase orders

Overhead absorption rate for Materials handling = ($70,000 ÷ 350) = $200 per material requisitions

(b) The production overheads absorbed for P1

= 6,000 x $70 + 50 x $3,000 + 100 x $250 + 200 x $200

= $635,000

## Classwork 6

2 Jessica Ltd makes trousers. The company has two manufacturing departments: X and Y. The following manufacturing overheads were budgeted for the year ended 30 June 2011:

| | X | Y |
|---|---|---|
| Allocated overheads | $120,000 | $140,000 |
| Electricity for machines | $25,000 | $15,000 |
| Salaries of production managers | $45,000 | $55,000 |
| Depreciation on machines | $40,000 | $20,000 |
| Factory rent | $31,250 | $18,750 |

Additional information:

| | X | Y |
|---|---|---|
| Machine hours | 25,000 | 15,000 |
| No. of employees | 180 | 220 |

(c) Calculate (to two decimal places) the predetermined fixed production overhead absorption rate for department X if machine hour is used as the base.

(d) Calculate (to two decimal places) the predetermined fixed production overhead absorption rate for department Y if number of employees is used as the base.

(c) The predetermined manufacturing overhead absorption rate for department X

= $261,250 / 25,000 = $10.45 per machine hour

(d) The predetermined manufacturing overhead absorption rate for department Y

= $248,750 / 220 = $1130.68 per employees

**Example 1**

J Hui operates a plant producing custom-made shoes. There are two manufacturing departments: cutting and assembly. The budgeted manufacturing overheads and levels of activity for the year ended 31 December 2010 were as follows:

| | *Cutting department* | *Assembly department* |
|---|---|---|
| Manufacturing overheads | $250,000 | $320,000 |
| Machine hours | 1,000,000 | 200,000 |
| Direct labour hours | 160,000 | 800,000 |

Job No. 334 was completed during the year. It consumed 5,000 and 850 machine hours in the cutting and assembly departments, respectively, and 760 and 3,600 direct labour hours in the cutting and assembly departments, respectively.

(a) Calculate the manufacturing overheads of Job No. 334, using a **plant-wide (全廠)** predetermined overhead absorption rate based on direct labour hours.

(b) Calculate the manufacturing overheads of Job No. 334, using **departmental (部門)** predetermined overhead absorption rates for each manufacturing department. The absorption base for cutting and assembly department is machine hours and direct labour hours respectively.

(c) During 2010, the record for Job No. 334 showed the following information:

| | *Cutting department* | *Assembly department* |
|---|---|---|
| Direct materials consumed | $18,000 | $1,200 |
| Direct manufacturing labour costs | $2,000 | $800 |

Calculate the total manufacturing cost of Job No. 334.

(a) Plant-wide predetermined overhead absorption rate

= ($250,000 + $320,000) ÷ (160,000 + 800,000)

= $0.59375 per direct labour hour

Manufacturing overheads absorbed into Job No. 334 = $0.59375 × (760 + 3,600) = $2,588.75

(b) **Departmental** predetermined overhead absorption rate for the cutting department

= $250,000 ÷ 1,000,000

= $0.25 per machine hour

**Departmental** predetermined overhead absorption rate for the assembly department

= $320,000 ÷ 800,000

= $0.4 per direct labour hour

Manufacturing overheads absorbed into Job No. 334 = (5,000 × $0.25) + (3,600 × $0.4)

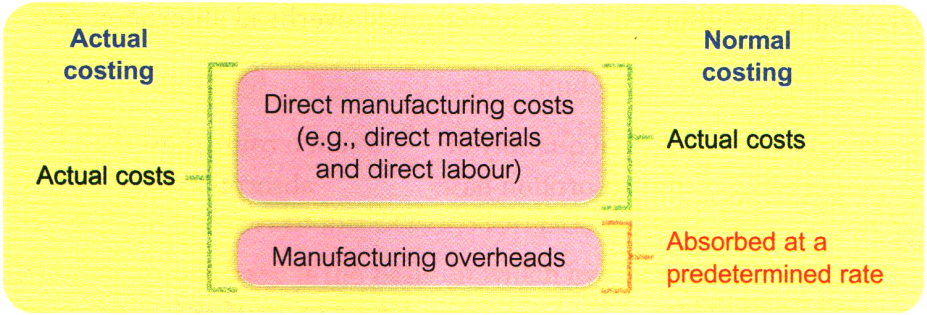
= $2,690

(c) Total manufacturing costs of Job No. 334 = ($18,000 + $2,000) + ($1,200 + $800) + $2,690

= $24,690

## Normal costing (正常成本計算法)

Under normal costing, direct manufacturing costs are charged on an actual basis, while manufacturing overheads are absorbed using a predetermined absorption rate.




In public examinations, it is quite common that only fixed manufacturing overheads are absorbed at a predetermined rate, while variable manufacturing overheads together with all direct manufacturing costs are charged to products on an actual basis.

**Classwork 3**

2 Sunshine Ltd uses two categories of direct manufacturing costs: direct materials and direct labour, and one manufacturing overhead. It absorbs manufacturing overheads into products using direct labour cost. The following information is provided for the year ended 31 December 2010:

| | Budget | Actual |
|---|---|---|
| Direct materials cost | $1,200,000 | $1,400,000 |
| Direct labour cost | $1,000,000 | $900,000 |
| Manufacturing overheads | $1,500,000 | $1,600,000 |

(a) Compute the predetermined manufacturing overhead absorption rate for the year.
(b) In June 2010, the job cost sheet for Job No. 432 contained the following information:
Direct materials used $30,000
Direct labour cost $25,000
Compute the total manufacturing cost of job No. 432 using normal costing.

(a) The predetermined manufacturing overhead absorption rate = $1,500,000 ÷ $1,000,000 = 1.5 per direct labour cost

(b) The total manufacturing costs of Job No. 432 = $30,000 + $25,000 + ($25,000 × 1.5) = $92,500

**Exhibit 20.5**

Given the following data of a manufacturing business budgeted for the year ended 31 December 2015:

| | |
|---|---|
| Fixed manufacturing overheads | $1,200,000 |
| Machine hours | 600,000 |

Suppose the business received a special order of 2,000 units in May 2015. The price charged for this special order should be able to cover the product costs.

Given the following production and cost data:

| | |
|---|---|
| Direct materials | $10 per unit produced |
| Direct labour | $8 per unit produced |
| Machine hours | 3 hours per unit produced |

(a) Calculate the predetermined fixed manufacturing overhead absorption rate on the basis of machine hours.
(b) Calculate the unit product cost and total product costs.

(a) Predetermined manufacturing overhead absorption rate = $1,200,000/$600,000 = 2 per direct labour cost

(b) Unit product cost = 10 + 8 + 3 x $2 = $24

Total product cost = $24 x 2,000 = $48,000

**HKDSE (2012, 6)** **(Absorption and marginal costing)**

Albert Manufacturing Company specialises in the production of mobile phones. It has two products, MP1 and MP2. MP1 only passes through production department A while MP2 only passes through production department B. The following budgeted information for the year ended 31 December 2013 is available:

(i) Total budgeted fixed production overheads for the two production departments for 2013 are $5,548,000:

| | Department A | Department B | |
|---|---|---|---|
| | $ | $ | |
| Departmental production overheads | 96,000 | 32,000 | |
| **Other production overheads:** | | | |
| Air-conditioning and lighting | 410,667 | 645,333 | |
| Insurance for machinery | 197,647 | 82,353 | |
| Rent and rates | 1,197,778 | 1,882,222 | |
| Salaries of supervisors | 288,000 | 192,000 | |
| Machinery depreciation | 355,765 | 148,235 | |
| Total | 2,545,857 | 2,982,143 | $5,548,000 |

(iii) Production and sales information relating to MP1 and MP2 for 2013:

| | MP1 | MP2 |
|---|---|---|
| Annual production and sales level | 80,000 units | 40,000 units |
| Direct material cost per unit | $210 | $250 |
| Direct labour cost per hour | $28 | $40 |
| Direct labour hours per unit – Department A | 2.5 hours | – |
| – Department B | – | 3 hours |
| Machine hours per unit – Department A | 1 hour | – |
| – Department B | – | 15 hours |

The company establishes a predetermined fixed production overheads absorption rate for each production department. Direct labour hour and machine hour are used as the bases for the fixed production overheads for Department A and Department B respectively.

**REQUIRED:**

(a) What are the meanings of direct costs and indirect costs? Explain with an example for each cost from the information provided above.

(b) (2) Calculate (to two decimal places) the predetermined fixed production overhead absorption rate for each production department.

(c) Prepare a statement to calculate (to two decimal places) the respective budgeted unit production costs of MP1 and MP2.

(d) If it is the company's practice to price every product at a mark-up of 25%, calculate (to the nearest dollar) the unit selling price of MP1.

(a) — Direct costs are those costs that can be specifically traced with a particular cost object (e.g. direct materials)

— Indirect costs cannot not be traced specifically with a give cost object (e.g. rent and rates)

(b) (2) Department A: Predetermined fixed production overhead absorption rate = $2,545,857 / (80,000 x 2.5)

= $12.73 per direct labour hour

Department B: Predetermined fixed production overhead absorption rate = $2,982,143 / (40,000 x 15)

= $4.97 per machine hour

(c)

**Statement to calculate the budgeted unit production cost**

| | **MP1** | | **MP2** |
|---|---|---|---|
| | $ | | $ |
| Direct material costs | 210 | | 250 |
| Direct labour cost ($28 x 2.5; $40 x 3) | 70 | | 120 |
| Fixed production overheads (A) ($12.73 x 2.5) | 31.825 | | — |
| Fixed production overheads (B) ($4.97 x 15) | — | | 74.55 |
| Unit production cost | 311.825 | | 444.55 |

(d) Unit selling price of MP1 = $311.825 x (1 + 25%) = $389.78 = $390

**Example 2**

John Wong operates a garment factory. The factory has two manufacturing departments: (1) machining and (2) assembly. The following figures were budgeted for the factory in January 2010 for the year ended 31 December 2010:

1. **Manufacturing overheads:**

| | ***Department*** | |
|---|---|---|
| | *Machining* | *Assembly* |
| Indirect labour salaries | $40,000 | $180,000 |
| Production supervisors' salaries | $25,000 | $75,000 |
| Factory rent | $96,000 | $144,000 |
| Factory utilities | $12,000 | $18,000 |
| Depreciation on machinery | $40,000 | $10,000 |

2. ***Additional information:***

| | ***Department*** | |
|---|---|---|
| | *Machining* | *Assembly* |
| Direct labour hours | 20,000 | 140,000 |
| Machine hours | 200,000 | 50,000 |

The absorption base for the manufacturing overheads of the machining department should be machine hours, while the manufacturing overhead absorption base for the assembly department should be direct labour hours.

(a) Calculate the predetermined manufacturing overhead absorption rates for the machining and assembly departments.

(b) Suppose a job, was completed during the year and its job cost sheet show the following actual results:

| | *Machining department* | *Assembly department* |
|---|---|---|
| Direct materials used | $6,000 | $4,000 |
| Direct labour cost | $5,000 | $36,000 |
| Direct labour hours | 500 | 2,500 |
| Machine hours | 4,000 | 800 |

**Find the total manufacturing costs of the Job.**

(a) Machining department's predetermined manufacturing overhead

= $40,000 + $25,000 + $96,000 + $12,000 + $40,000 = $213,000

Machining department's predetermined manufacturing overhead absorption rate

= $213,000 ÷200,000 = $1.065 per machine hour

Assembly department's predetermined manufacturing overhead

= $180,000 + $75,000 + $144,000 + $18,000 + $10,000 = $427,000

Assembly department's predetermined manufacturing overhead absorption rate

= $427,000 ÷140,000 = $3.05 per direct labour hour

(b)

| | $ |
|---|---|
| Direct materials ($6,000 + $4,000) | 10,000 |
| Direct labour cost ($5,000 + $36,000) | 41,000 |
| Manufacturing overheads absorbed: chining department (4,000 x $1.065) | 4,260 |
| Assembly department (2,500 x $3.05) | 7,625 |
| Total manufacturing costs | 62,885 |

## 20.4.3 Over- or under-absorbed overheads (多吸收與少吸收間接費用)

- Predetermined manufacturing overhead absorption rates may be **inaccurate (預定間接製造費用吸收率可能不準確)**.
- As a result, the overheads absorbed may differ from the **actual overheads** incurred during that period. (**因此，吸收的間接製造費用可能與該期間發生的實際間接製造費用不同**)
- **Under-absorption (少吸收間接製造費用):**
  - The predetermined amount of overheads **absorbed** < The actual amount of overheads **incurred.**
  - (**預定間接製造費用金額 < 實際間接製造費用金額**)
- **Over-absorption (多吸收間接製造費用):**
  - The predetermined amount of overheads absorbed > The actual amount of overheads incurred.
  - (**預定間接製造費用金額 > 實際間接製造費用金額**)
- The amount of over- or under-absorbed overheads should be adjusted in the **cost of goods sold** for the period. (**多吸收或少吸收的間接費用的金額應在銷貨成本內進行調整**)

**Classwork 3**

2 Sunshine Ltd uses two categories of direct manufacturing costs: direct materials and direct labour, and one manufacturing overhead. It absorbs manufacturing overheads into products using direct labour cost. The following information is provided for the year ended 31 December 2010:

| | Budget | Actual |
|---|---|---|
| Direct materials cost | $1,200,000 | $1,400,000 |
| Direct labour cost | $1,000,000 | $900,000 |
| Manufacturing overheads | $1,500,000 | $1,600,000 |

(a) Compute the predetermined manufacturing overhead absorption rate for the year.

(b) In June 2010, the job cost sheet for Job No. 432 contained the following information:

| | |
|---|---|
| Direct materials used | $30,000 |
| Direct labour cost | $25,000 |

Compute the total manufacturing cost of job No. 432 using normal costing.

(c) At the end of 2010, compute the under- or over-absorbed manufacturing overheads for the year under normal costing.

(a) The predetermined manufacturing overhead absorption rate = $1,500,000 ÷ $1,000,000 = 1.5 per direct labour cost

(b) The total manufacturing costs of Job No. 432 = $30,000 + $25,000 + ($25,000 × 150%) = $92,500

(c) Total manufacturing overheads absorbed = $900,000 × 150% = $1,350,000

Total manufacturing overheads incurred = $1,600,000

Under-absorbed manufacturing overheads = $1,600,000 − $1,350,000 = $250,000

**Classwork 3**

1 Winter Ltd calculates its predetermined overhead absorption rate annually on the basis of machine hours. The total budgeted manufacturing overheads were $345,000 and the total budgeted machine hours were 25,000 hours. Total actual manufacturing overheads and machine hours for the year were $356,000 and 26,000 hours, respectively.

(a) Calculate the predetermined overhead absorption rate for the year ended 31 December 2012.

(b) Determine the under- /over-absorbed manufacturing overheads for the year ended 31 December 2012.

(a) Predetermined overhead absorption rate = $345,000 ÷ 25,000 hours = $13.8 per machine hour

(b) Total manufacturing overheads absorbed = 26,000 × $13.8 = $358,800

Total manufacturing overheads incurred = $356,000

The amount of over-absorbed manufacturing overheads = $358,800 − $356,000

= $2,800

**HKDSE (2016, 3)** **(Cost-Volume-profit analysis)**

Thomson Company computes its annual predetermined manufacturing overhead absorption rate on the basis of machine hours. In December 2014, it estimated that 50,000 machine hours would be required for the planned level of production in 2015. The company also estimated that fixed manufacturing overheads would amount to $450,000 and variable manufacturing overheads would be $6 per machine hour for 2015.

The actual manufacturing overheads for 2015 were $717,000 and the actual number of machine hours was 48,000 hours.

**REQUIRED:**

(a) Calculate the predetermined manufacturing overhead absorption rate for 2015.
(b) Calculate the under-absorption or over-absorption of manufacturing overheads for 2015.
(c) For the under-absorbed or over-absorbed manufacturing overheads calculated in (b), state the accounting treatment and its impact on the net profit for 2015.
(d) State one variable manufacturing overhead cost which increases with the usage of machine hour.

(a) Predetermined fixed manufacturing overhead absorption rate = $450,000/50,000 = $9 per machine hour

The predetermined manufacturing overhead absorption rate

= $450,000/50,000 + $6 = $15 per machine hour

(b) The predetermined manufacturing overhead = 48,000 x $15 = $720,000

The actual manufacturing overheads = $717,000

The over-absorbed manufacturing overheads for 2015 = $720,000 – $717,000 = $3,000

(c) — Over-absorbed manufacturing overheads should be credited to the profit and loss account to reduce cost of goods sold.
— This would increase the net profit of 2015.

(d) — The electricity of using machine
— Fuel and power
— Lubricants
— Depreciation of factory machinery

**Classwork 5**

1 Pitt Smith Ltd has a plant in Tai Po. The company has two production departments: the wiring department and the polishing department. The company has selected machine hours as the absorption base for the wiring department and direct manufacturing labour costs as the absorption base for the polishing department.

The 2005 budget for the Tai Po plant was as follows:

| | *Wiring department* | *Polishing department* |
|---|---|---|
| Manufacturing overheads | $13,000,000 | $10,600,000 |
| Direct manufacturing labour costs | $2,080,000 | $5,800,000 |
| Direct manufacturing labour hours | 42,000 hrs | 210,000 hrs |
| Machine hours | 340,000 hrs | 42,500 hrs |

The actual figures at the end of 2005 were as follows:

| | *Wiring department* | *Polishing department* |
|---|---|---|
| Manufacturing overheads | $13,400,000 | $10,800,000 |
| Direct manufacturing labour costs | $2,400,000 | $5,950,000 |
| Machine hours | 365,000 hrs | 40,500 hrs |

(a) Calculate the predetermined overhead recovery rates for the two departments for 2005.

(b) Calculate the under-or over-absorbed manufacturing overhead for each department.

(c) During 2005, the record card for Job T44 showed the following information:

| | *Wiring department* | *Polishing department* |
|---|---|---|
| Direct materials consumed | $124,300 | $15,800 |
| Direct manufacturing labour costs | $60,000 | $4,600 |
| Direct manufacturing labour hours | 3,200 hrs | 150 hrs |
| Machine hours | 250 hrs | 40 hrs |

Calculate the total manufacturing overhead to be absorbed by Job T44.

(d) Calculate the total production cost and unit product cost of Job T44 if there were 500 units of output produced under the job.

(a) Predetermined overhead recovery rates for Wiring department

= $13,000,000 ÷ 340,000 = $38.24 per machine hour

Predetermined overhead recovery rates for Polishing department

= $10,600,000 ÷ $5,800,000 = 1.8276 per direct manufacturing labour costs

(b) Manufacturing overhead incurred for Wiring department = $13,400,000

Manufacturing overhead absorbed for Wiring department = 365,000 x $38.24 = $13,957,600

Over-absorption for Wiring department = $13,957,600 − $13,400,000 = $557,600

Manufacturing overhead incurred for Polishing department = $10,800,000

Manufacturing overhead absorbed for Polishing department = $5,950,000 x 1.8276 = $10,874,220

Over-absorption for Polishing department = $10,874,220 − $10,800,000 = $74,220

(c) Manufacturing overhead absorbed for Wiring department = 250 x $38.24 = $9,560.00

Manufacturing overhead absorbed for Polishing department = $4,600 x 1.8276 = $8,406.96

Total manufacturing overhead absorbed by Job T44 = $9,560.00 + $8,406.96 = 17,966.96

(d) Total job cost = ($124,300 + $15,800) + ($60,000 + $4,600) + 17,966.96 = $222,666.96

Unit product cost = $222,666.96 ÷500 = $445.33

**Classwork 7**

2 Chung Tin Manufacturing Co Ltd Specialises in production and supply of sports for kids. It has two production departments. The data provided below has been extracted from the company's budget for next year.

| | Production department | |
|---|---|---|
| | Cutting | Assembly |
| Total Budgeted overhead | $3,172,000 | $4,068,000 |

Additional data extracted from the next year's budget, and information regarding how the production department work is provided below.

| | Production department | |
|---|---|---|
| | Cutting | Assembly |
| Machine hours | 600,000 | 100,000 |
| Direct labour hours | 10,000 | 800,000 |

(a) Calculate the budgeted overhead absorption rates for each production department using a machine hour rate for the cutting department and a direct labour hour rate for the assembly department. (Correct to 1 decimal places)

(b) The company is going to quote a price for an order to produce and supply 10,000 pairs of sports shoes. The estimated direct costs for the order are direct materials of $330,000 and direct labour of $240,000. The order also requires work of 60,000 machine hours in the cutting department and 30,000 direct labour hours in the assembly department. The quoted prices are calculated to provide a net profit margin of 25% of sales. Calculate the price that should be quoted for the order.

(c) If next year 500,000 machine hours were worked in the cutting department, 900,000 direct labour hours were worked in the assembly department, and the actual overheads for the cutting department and the assembly department were $2,000,000 and $5,600,000. Calculate any under or over absorption of overheads separately for the cutting and the assembly department.

(a) Cutting department's budgeted overhead absorption rate

= 3,172,000 ÷600,000 = $5.3 per machine hour

Assembly department's budgeted overhead absorption rate

= $4,068,000 ÷800,000 = $5.1 per direct labour hour

(b) Quoted price:

| | $ |
|---|---|
| Direct materials | 330,000 |
| Direct labour | 240,000 |
| Manufacturing overheads absorbed: | |
| Cutting department (60,000 x $5.3) | 318,000 |
| Assembly department (30,000 x $5.1) | 153,000 |
| Production costs | 1,041,000 |
| Profit margin (25%) | 347,000 |
| Quoted price (100%) | 1,388,000 |

(c) Under- or over-absorption of overheads:

| | Cutting | Assembly |
|---|---|---|
| Overheads absorbed | 500,000 x $5.3 = $2,650,000 | 900,000 x $5.1 = $4,590,000 |
| Overheads incurred | $2,000,000 | $5,600,000 |
| | Over-absorption $650,000 | Under-absorption $1,010,000 |

**Over- or under-absorption of fixed manufacturing overheads (多吸收或少吸收固定製造費用)**

根據吸收成本法，如果實際固定製造費用不同於吸收製造費用，會出現多吸收或少吸收固定製造費用，因此需要在損益表內調整。而根據邊際成本法，是沒有多吸收或少吸收固定製造費用，因此不需要在損益表內調整。

**在公開考試所需的處理**

在吸收成本法下，少吸收的固定製造費用會加到銷貨成本，而多吸收的固定製造費用會從銷貨成本中扣除。

**Income statement for the month ended 31 January 2011**

| | $ | $ |
|---|---|---|
| Sales | | 98,000 |
| Less: Cost of goods sold | | |
| Opening inventory | 10,000 | |
| Direct material cost | 27,000 | |
| Direct labour cost | 18,000 | |
| Variable production overheads | 13,500 | |
| **Fixed production overheads absorbed** | 11,250 | |
| | 79,750 | |
| Less: Closing inventory [($69,750 / 2,250) x 250] | (7,750) | |
| | 72,000 | |
| **Add Under-absorption of fixed factory overheads** | **1,000** | 71,000 |
| Gross profit | | 27,000 |
| Less: Variable non-production overheads | (8,000) | |
| Fixed non-production overheads | (3,000) | (11,000) |
| Net profit | | 16,000 |

## The advantages and disadvantages of the two costing approaches

| | Absorption costing 吸收成本法 | Marginal costing 邊際成本法 |
|---|---|---|
| **Concept 概念** | **All manufacturing costs, either fixed or variable, are treated as product cots.** | **Only variable manufacturing costs are treated as product costs.** |
| **Advantages 優點** | **— Distinguishing between manufacturing and non-manufacturing costs is easier than distinguishing between fixed and variable costs.**<br>**— Including both fixed and variable manufacturing costs in inventory valuation can better reflect the costs incurred to produce goods.** | **— Marginal costing can classify costs into variable and fixed. This can help managers making better business decisions.**<br>**— Fixed manufacturing costs are sunk costs and are not relevant to decision-making. Thus, excluding fixed manufacturing costs can help make better decisions.**<br>**— Avoid manipulation of profit by changing inventory level.** |
| **Disadvantages 缺點** | **— Fixed manufacturing costs are sunk costs and are not relevant to decision-making.**<br>**— The net profit figure can be manipulated by changing the inventory level.** | **— Extra time and efforts are required to distinguish between fixed and variable costs.** |

## 兩種成本計算法的比較

### 1 Closing inventory valuation (期末存貨價值)

**根據吸收成本法，期末存貨價值包括變動及固定製造成本。根據邊際成本法，只有變動製造成本計入期末存貨價值。因此吸收成本法的期末存貨價值較邊際成本法的期末存貨價值為高。**

### 2 Cost of goods sold (銷貨成本)

**由於吸收成本法的期末存貨價值較邊際成本法的期末存貨價值為高，因此吸收成本法的銷貨成本較邊際成本法的銷貨成本為低。**

### 3 Gross profit and net profit (毛利和純利)

**由於吸收成本法的銷貨成本較邊際成本法的銷貨成本為低，吸收成本法的損益表毛利和純利較邊際成本法的損益表毛利和純利為高。**

## Classwork 3

3 Snowball Ltd produces a single product. Fixed production overheads were absorbed at the rate of $30 per unit, the actual fixed production overheads were $12,000,000 per annum. The company's year-end date is 31 December. The following information was extracted from the books:

| | *2013* |
|---|---|
| Production in units | 380,000 |
| Sales in units | 370,000 |

Cost and price data for 2012 and 2013:

| | $ |
|---|---|
| Direct materials per unit produced | 34 |
| Direct labour per unit produced | 12 |
| Variable production overheads per unit produced | 9 |
| Selling price per unit | 170 |

Non-manufacturing overheads for the past two years are as follows:

| | |
|---|---|
| Variable non-manufacturing overheads | $27 per unit sold |
| Fixed non-manufacturing overheads | $8,000,000 per annum |

As at 31 December 2013, 90,000 units of the product remained unsold.

***Required:***

(a) Calculate the unit production costs for 2013 under absorption costing;
(b) Calculate the opening inventory in units and in value;
(c) Determine the under- /over-absorbed of fixed production overheads;
(d) Prepare an income statement for the year ended 31 December 2013, using absorption costing.

(a) Unit production costs under absorption costing = $34 + $12 + $9 + $30 = $85

(b) Opening inventory in unit + Production unit –Sales in unit = Closing inventory in unit

Opening inventory in unit + 380,000 – 370,000= 90,000

Opening inventory in unit = 370,000 + 90,000 – 380,000 = 80,000 unit

Opening inventory in value = 80,000 × $85 = $6,800,000

(c) Fixed production overheads absorbed = 380,000 x $30 = $11,400,000

Fixed production overheads incurred = $12,000,000

Under-absorption of fixed production overheads = $12,000,000 – $11,400,000 = $600,000

(d)

**Snowball Ltd**
**Income Statement for the year ended 31 December 2013**

| | $ | | $ |
|---|---|---|---|
| Sales (370,000 × $170) | | | 62,900,000 |
| Less Cost of goods sold: | | | |
| Opening inventory | 6,800,000 | | |
| Direct materials (380,000 x $34) | 12,920,000 | | |
| Direct labour (380,000 x $12) | 4,560,000 | | |
| Variable production overheads (380,000 x $9) | 3,420,000 | | |
| Fixed production overheads absorbed | 11,400,000 | | |
| Cost of goods available for sale | 39,100,000 | | |
| Less Closing inventory (32,300,000/380,000 × 90,000) | (7,650,000) | | |
| | 31,450,000 | | |
| Add Under-absorption of fixed factory overheads | 600,000 | | (32,050,000) |
| Gross profit | | | 30,850,000 |
| Less Variable non-manufacturing overheads (370,000 × $27) | 9,990,000 | | |
| Fixed non-manufacturing overheads | 8,000,000 | | (17,990,000) |
| Net profit | | | 12,860,000 |

## 20.7 A more complicated example

Sharon started a small manufacturing business on 1 January 2009. The following figures were extracted from the books for the year ended 31 December 2009:

| | $ | |
|---|---|---|
| Direct materials purchased | 25,800 | |
| Direct labour cost | 12,000 | |
| Fixed manufacturing overheads | 6,000 | |
| Non-manufacturing overheads: | | |
| Variable | 5,000 | |
| Fixed | 14,000 | |
| Selling price | 100 | |
| | | |
| Completed | | 700 units |
| Sold | | 650 units |

Fixed manufacturing overheads were absorbed at the rate of $6 per unit based on the normal level of production.

(a) Prepare an income statement for the year ended 31 December 2009 using absorption costing.

(b) Prepare an income statement for the year ended 31 December 2009 using marginal costing.

(a) Under absorption costing

**Income Statement for the year ended 31 December 2009**

| | $ | | $ |
|---|---|---|---|
| Sales (650 × $100) | | | 65,000 |
| Less Cost of goods sold: | | | |
| Direct materials | 25,800 | | |
| Direct labour cost | 12,000 | | |
| Fixed manufacturing overheads absorbed (700 x $6) | 4,200 | | |
| | 42,000 | | |
| Less Closing inventory ($42,000 x 50/700) | (3,000) | | |
| | 39,000 | | |
| Add Under-absorption of fixed factory overheads (W1) | 1,800 | | (40,800) |
| Gross profit | | | 24,200 |
| Less Variable non-manufacturing overheads | 5,000 | | |
| Fixed non-manufacturing overheads | 14,000 | | (19,000) |
| Net profit | | | 5,200 |

W1: Under-absorption of fixed factory overheads = $6,000 (Incurred) – $4,200 (Absorbed) = $1,800

(b) Under marginal costing

**Income Statement for the year ended 31 December 2009**

| | $ | | $ |
|---|---|---|---|
| Sales (650 × $100) | | | 65,000 |
| Less Variable cost of goods sold: | | | |
| Direct materials | 25,800 | | |
| Direct labour cost | 12,000 | | |
| | 37,800 | | |
| Less Closing inventory (37,800/700 x 50) | (2,700) | | 35,100 |
| Product contribution margin | | | 29,900 |
| Less Variable non-manufacturing overheads | | | (5,000) |
| Total contribution margin | | | 24,900 |
| Less Fixed manufacturing overheads | 6,000 | | |
| Fixed non-manufacturing overheads | 14,000 | | (20,000) |
| Net profit | | | 4,900 |

**HKDSE (2012, 4)** **(Absorption and marginal Costing)**

Magic Company manufactures and sells a single product, Product X. For the purpose of preparing the budget for Product X for the month of November 2012, the following information is provided:

(i) The budgeted production and budgeted sales for the month are 5,000 and 4,400 units respectively.

(ii) The expected selling price is $300 per unit.

(iii) The direct material cost of the production is $40 per unit. An additional transportation cost of $2 per unit is to be incurred for the purchase of the direct materials.

(iv) Each unit of product requires 2 hours of direct labour. The hourly rate of direct labour is $60.5.

(v) The production overheads of the product comprise a fixed and a variable element. It is the company's policy to apportion variable production overheads in relation to the number of units produced.
Assuming the monthly fixed production overheads of the company remain the same in 2012, the annual budgeted production overheads will be $1,159,000 if 58,000 units are produced each year, and $1,203,000 if 66,000 units are produced each year.

(vi) Selling and distribution expenses consist of a sales commission of $8 per unit sold and a fixed monthly distribution expense of $50,000.

**REQUIRED:**

Magic Company adopts the marginal costing system. Assume it does not keep any inventories as at 31 October 2012. Using marginal costing, prepare budgeted income statements for the month ended 30 November 2012.

**Magic Company**
**Income Statement for the month ended 30 November 2012 using marginal costing**

| | $ | | $ |
|---|---|---|---|
| Sales (4,400 × $300) | | | 1,320,000 |
| Less: Variable cost of goods sold: | | | |
| Direct materials ($40 x 5,000) | 200,000 | | |
| Transportation cost on direct materials ($2 x 5,000) | 10,000 | | |
| Direct labour cost ($60.5 x 2 x 5,000) | 605,000 | | |
| Variable production overheads (W1) | 27,500 | | |
| | 842,500 | | |
| Less: Closing inventory [($842,500 / 5,000) x 600] | (101,100) | | 741,400 |
| Product contribution margin | | | 578,600 |
| Less: Sales commissions ($8 x 4,400) | | | (35,200) |
| Contribution | | | 543,400 |
| Less: Fixed production overhead ($1 159 000 – $5.5 x 58 000)/12 | 70,000 | | |
| Fixed monthly distribution expense | 50,000 | | 120,000 |
| Net profit | | | 423,400 |

W1 : Variable production overheads per unit = [($1,203,000 – $1,159,000)/(66,000 – 58,000) = $5.5 per unit

Variable production overheads = 5,000 x $5.5 = $27,500

**HKDSE (2022, 6)** **(Absorption and Marginal Costing)**

6. Ali Company produces a single product, Product Y. It does not keep inventory of finished goods. The production overheads and selling costs are mixed costs. Annual total fixed cost amounted to $2,800,000. The ratio of fixed production cost to fixed non-production cost is 7:3.

The income statement for the year ended 31 March 2022 is drafted as below:

| | $ |
|---|---|
| Sales | 6,000,000 |
| Less: Costs | |
| Direct material costs | 1,700,000 |
| Direct labour costs | 300,000 |
| Production overheads | 2,500,000 |
| Selling costs | 1,000,000 |
| | 5,500,000 |
| Net profit | 500,000 |

Peter, the Sales Manager, estimated that sales will decline by 25% next year. As such, he predicted that the net profit will decrease by 25% from $500,000 to $375,000 next year.

**REQUIRED:**

(a) Based on Peter's estimation on the sales next year, prepare an income statement for the next year using the marginal costing system.

(b) Explain why the prediction made by Peter regarding the net profit next year is wrong.

(a)

**Ali Company**
**Income Statement for the year ended 31 December 2015 using marginal costing**

| | $ | | $ |
|---|---|---|---|
| Sales [$6,000,000 x (1 – 25%)] | | | 4,500,000 |
| Less: Variable cost of goods sold: | | | |
| Direct materials [$1,700,000 x (1 – 25%)] | 1,275,000 | | |
| Direct labour [$300,000 x (1 – 25%)] | 225,000 | | |
| Variable production overheads ($2,500,000 – $2,800,000 x 7/10) | 540,000 | | 2,040,000 |
| Product contribution margin | | | 2,460,000 |
| Less Variable selling costs ($1,000,000 – $2,800,000 x 3/10) | | | 160,000 |
| Total contribution margin | | | 2,300,000 |
| Less: Fixed Production overheads($2,800,000 x 3/10) | 840,000 | | |
| Fixed Selling costs($2,800,000 x 7/10) | 1,960,000 | | 2,800,000 |
| Net loss | | | (500,000) |

(b) 因為他把固定成本當作變動成本減少 25%，但固定成本不會隨著銷貨降低 25%而降低 25%。固定成本會維持不變。所以陳德對下年度成本的預測是錯誤的。也因此陳德對下年度淨利的預測是錯誤的。

**HKDSE (2021, 6)** **(Absorption and Marginal Costing)**

6. Macy Limited manufactures three products: X, Y and Z. The company keeps no inventory of materials and completed goods. The budgeted figures for the coming quarter are as follows:

| **Product** | **Note** | **X** | **Y** | **Z** |
|---|---|---|---|---|
| Sales quantity (units) | | 240 000 | 120 000 | 20 000 |
| Direct labour hours required per unit | | 0.2 hour | 0.15 hour | 0.1 hour |
| Unit contribution margin | | $2.7 | $2.45 | $4.2 |
| | | $ | $ | $ |
| Sales | | 2 400 000 | 1 320 000 | 340 000 |
| Costs: | | | | |
| Direct materials | | 600 000 | 420 000 | 160 000 |
| Direct and indirect labour | (i) | 1 060 000 | 460 000 | 140 000 |
| Fixed and variable manufacturing overheads | (ii) | 480 000 | 390 000 | 80 000 |
| | | 2 140 000 | 1 270 000 | 380 000 |
| Profit / (Loss) | | 260 000 | 50 000 | (40 000) |

Notes:

(i) Direct labour cost is budgeted at $20 per labour hour, whereas indirect labour cost is fixed.

(ii) Budgeted total fixed manufacturing overheads for the coming quarter was $456,000, which would be allocated to products X, Y and Z on the basis of units sold.

**REQUIRED:**

(a) Calculate the following for Macy Limited for the coming quarter:

(1) the total indirect labour cost, showing the amounts to be shared by products X, Y and Z respectively.

(2) the fixed manufacturing overheads to be allocated to products X, Y and Z respectively, basing on the budgeted total amount in note (ii) above.

(3) the unit variable manufacturing overheads for products X, Y and Z respectively.

(a) (1)

| Product | | X | | Y | | Z | | Total |
|---|---|---|---|---|---|---|---|---|
| | | $ | | $ | | $ | | $ |
| Total labour | | 1,060,000 | | 460,000 | | 140,000 | | 1,660,000 |
| Less: Direct labour | W1 | 960,000 | W2 | 360,000 | W3 | 40,000 | | 1,360,000 |
| Indirect labour | | 100,000 | | 100,000 | | 100,000 | | 300,000 |

W1: Direct labour of X = 240,000 x 0.2 x $20 = $960,000

W2: Direct labour of Y = 120,000 x 0.15 x $20 = $360,000

W3: Direct labour of Z = 20,000 x 0.1 x $20 = $40,000

(2)

Total units of sold = 240,000 + 120,000 + 20,000 = 380,000

The fixed manufacturing overheads absorption rate = $456,000/380,000 = $1.2 per unit

The fixed manufacturing overheads to be allocated to products X = 240,000 x $1.2 = $288,000

The fixed manufacturing overheads to be allocated to products Y = 120,000 x $1.2 = $144,000

The fixed manufacturing overheads to be allocated to products Z = 20,000 x $1.2 = $24,000

(3)

Unit variable manufacturing overheads for products X = ($480,000 – $288,000)/240,000 = $0.8 per unit

Unit variable manufacturing overheads for products Y = ($390 000 – $144,000)/120,000 = $2.05 per unit

Unit variable manufacturing overheads for products Z = ($80 000 –$24,000)/20,000 = $2.8 per unit