# Answer Key

## Solution MCQ Question 1(24 marks)

1.B **(1.5 marks)**
2.D **(1.5 marks)**
3.D **(1 mark)**
4.D **(1 mark)**
5. B **(1 mark)**
6. A **(1 mark)**
7. B **(1 mark)**
8. C **(1 mark)**
9. B **(1 mark)**
10. B **(1.5 marks)**
11. C **(1 mark)**
12. B **(1.5 marks)**
13. E **(1 mark)**
14. B **(1 mark)**
15. A **(1 mark)**
16. D **(2 marks)**
17. C **(1.5 marks)**
18. D **(1 mark)**
19. A **(1 mark)**
20.C **(1.5 marks)**

**Question 2 (16 marks)**

**a.** Best Estimate = 8,000 + .0002 (25,000,000)
= 13,000 units
NI (B) = 4(X) – 45,000
Breakeven = 11,250 units

Lower limit = Best – t Value X Se
11,250 = 13,000 – t Value 700
t Value= 2.5

From the table Df = 23, so there is a chance between .5%- 2.5 % that the company will lose money.

**b.** Best Estimate = 8,000 + .0002 (25,000,000)
= 13,000 units

| | | | | |
|---|---|---|---|---|
| Lower limit | | | - | (1.714 X 700) 14,200 units |
| Or | = | 13,000 | OR | |
| Upper limit | | | + | (1.714 X 700) 11,800 units |

**c.** Upper limit = Best + t Value X Se
14,964 = 13,000 + t Value (700)
t Value= 2.806

From the table Df = 23, so there is .5% probability that the company will sell more than 14,964 units.

**d.** **Indifference point**

6X + 20,000 = 4X + 45,000
2X = 25,000
X = 12,500units

**Breakeven point**
8 X – 6 X – 20,000 = 0
2 X = 20,000
X = 10,000 units

Costs (A) = 6X + 20,000
= 6(10,000) + 25,000
= $80,000

Costs (B) = 4X + 45,000
= 4 (10,000) + 65,000
= $85,000

Cost of prediction error = 85,000 – 80,000 = 5,000

NI (B) = 4X - 45,000
= 4(8,000) - 45,000
= ($13,000) loss
Stay out of business = 0

Cost of prediction error = 0 - (-13,000) = 13,000

The cost of prediction error between 10,000 -12,500 is $5,000. The incremental cost of prediction error between 8,000 and 10,000 units will be (13,000 – 5,000) = $8,000

An alternate solution is that if the demand below 10,000 units, then the optional choice is no longer (A). Staying out of business becomes the optimal choice, and accordingly the cost of prediction error is calculated as follows

[8(9,999) - 4 (9,999) - 45,000] = 5,004

If the demand is 9,998 units, the cost of prediction error is

[8(9,998) - 4(9,998) - 45,000] = 5,008

The cost of prediction error is therefore $4 per unit for every unit below 10,000. Over the range of demand from 8,000 to 10,000 the cost of prediction error is (4 X 2,000) = 8,000

| | Average cost of prediction error | | Probability | |
|---|---|---|---|---|
| Expected prediction error costs | = (5,000 + 0) / 2 | X | 12.50%* | = $312.50 |
| | = ( 8,000 + 0)/ 2 | X | 10.00%** | = 400.00 |
| Expected prediction error costs (Expected value of perfect information) | | | | = $712.50 |

*(12,500 – 10,000) / (28,000 - 8,000) = 12.50%
** (10,000 – 8,000) / (28,000 - 8,000) = 10.00%

**Question 3 (30 marks) No partial marks or marks for formulas**

a. **Reconciliation between Budgeted Operating Income and Actual Operating Income ***

| | | |
|---|---|---|
| **Budgeted Net income** | | $632,500.00 |
| **Sales Price Variance:** | | |
| Basic 7,200 (325 – 300) | | + 180,000 F |
| Deluxe 4,800 (700 – 800) | | - 480,000 U |
| **Variable Costs:** | | |
| DM Price Variance – Basic 540,000 (1 - 0.90) | +54,000 F | |
| DM Usage Variance – Basic 1 X (504,000 – 540,000) | -36,000 U | 18,000 F |
| DM Price Variance- Deluxe 912,000 (1- 0.90) | +91,200.F | |
| DM Usage Variance- Deluxe 1 X (912,000 – 912,000) | -0- | 91,200 F |
| DL Rate Variance – Basic 46,800 X (15 – 16) | -46,800 U | |
| DL Efficiency Variance – Basic15 X ([7,200 X 6] – 46,800) | -54,000 U | 100,800 U |
| DL Rate Variance- Deluxe 74,400 X (15-16) | -74,400 U | |
| DL Efficiency Variance- Deluxe 15 X ([4,800 X6] – 74,400) | +36,000 F | 38,400 U |
| VOH Spending Variance - Basic 46,800 X (7.50 – 8.00) | -23,400 U | |
| VOH Efficiency Variance-Basic 7.50 X ([7,200 X 6] – 46,800) | -27,000 U | 50,400 U |
| VOH Spending Variance – Deluxe 74,400 X (7.50 – 8.00) | - 37,200 U | |
| VOH Efficiency Variance-Deluxe 7.50 X ([4,800 X6] – 74,400) | + 18,000 F | 19,200 U |
| Variable Selling and Admin Flexible Budget Variance-Basic | -0- | |
| Variable Selling and Admin Flexible Budget Variance-Deluxe | -0- | -0- |
| **Fixed Costs:** | | |
| Fixed OH Flexible Budget Variance (750,000 – 780,000) | | -30,000 U |
| Fixed S&A Flexible Budget Variance (132,500 – 139,500) | | - 7,000 U |
| **Sales Volume Variances:** | | |
| Sales Mix Variance – Basic (.60 - .45) X12,000 X 80 | + 144,000 F | |
| Sales Quantity Variance – Basic (12,000 – 10,000) X.45 X 80 | + 72,000 F | 216,000 F |
| Sales Mix Variance – Deluxe (.40 - .55) X12,000 X 210 | - 378.000 U | |
| Sales Quantity Variance – Deluxe (12,000 – 10,000)X.55 X 210 | + 231,000 F | 147,000 U |
| **Actual Net income** | | $264,900.00 |

**Other variances**

Market Share Variance = (.090000225 - .10) X 133,333 X 151.50 = 201,994.95 U

Market Size Variance = (133,333 – 100,000) X .10 X 151.50 = = 504,994.95 F

b. The reasons could include the following:

(1). Decrease in market share; 201,994.95 U

(2). Increase in direct labor rate; 46,800 U and 74,400 U.

(3). Increase in the fixed overhead costs; -30,000 U.

(4). Decrease in the selling price of Deluxe; 480,000 U.

(5). Decrease in sales mix of the Deluxe that has higher CM per unit; 378.000 U.

(6). Increase in fixed selling and administrative costs; 7,000 U.

(7). Increase in variable overhead spending; 23,400 U and 37,200 U.

(8). Decline in direct labor efficiency in producing the Basic; 54,000 U, and so VOH 27,000 U.

(9). Decline in the utilization of direct materials during the production of the Basic; 36,000 U

**Question 4 (10 marks)**

**a.**

| | **AQ X AP** | **AQ X SP** | **SQ X SP** |
|---|---|---|---|
| | 123,826 X 11 | 123,826 X 12 | 103,000 X12 |
| **Deet** | 1,362,086.....123,826 F..... | 1,485,912.....249,912 U.... | 1,236,000 |
| | **Deet** Price Variance | **Deet** Usage Variance | |

**SQ = 206,000/10 X 5**

| | **AQ X AP** | **AQ X SP** | **SQ X SP** |
|---|---|---|---|
| | 115,083 X 9 | 115,083 X 6 | 123,600 X6 |
| **Balox** | 1,035,747.....345,249 U..... | 690,498.....51,102 F.... | 741,600 |
| | **Balox** Price Variance | **Balox** Usage Variance | |

**SQ = 206,000/10 X 6**

**b.**

| Actual Quantity of Input, at the Standard Price (AQ × SR) | Total Actual Quantity of Input X Standard Mix, at the Standard Rate (Total AQ XSM × SP) | Standard Quantity Allowed for Output, at the Standard Price (SQ × SP) |
|---|---|---|
| (123,826 X 12) = $1,485,912 | (238,909 X5/11X 12) = $1,303,140 | (103,000 X12) = 1,236,000 |
| (115,083 X 6) = $690,498 | (238,909 X 6/11 X6) = $781,884 | (123,600 X6) = 741,600 |
| $2,176,410 | $2,085,024 | $1,977,600 |

| DM Mix Variance $91,386 U **(1.5 marks)** | DM Yield Variance $107,424 U **(1.5 marks)** |
|---|---|
| DM Usage Variance, $198,810 U | |

Note: there are several acceptable formulae for calculating the yield and mix variances in addition to the above. The variances attributed to the individual input may be different using other formulae, but the total variance is always the same (subject to rounding errors).

**c.** While the price variance maybe beyond our control (i.e., Deet 123,826F and Balox 345,249U), the variances relating to how efficiently we used Deet and Balox (the mix and yield) caused net income to be about 200,000 less than would have been possible. Balox evaporation policy saved about $50,000. If the same care could be devoted to Deet evaporation, exceptional profit levels may be achieved. The excessive use of Deet cost the firm nearly $250,000. Certain unexpected occurrences prevented PML from reaching its true profit potential. Therefore, it would be appropriate to carefully investigate the planned procedures for the use of materials next year.

**Question 5 (20 marks)**

**a. 1 Physical measure method**

| Product | Physical Output At Split off Point | Proportion | X | Joint costs | = | Share of each product |
|---|---|---|---|---|---|---|
| LE-HD | 300 chips | 25% | X | 5,000 | = | 1,250 |
| LE-LD | 900 chips | 75% | X | 5,000 | = | 3,750 |
| Total | 1,200 | 100% | | | | 5,000 |

| | LE-HD | LE-LD |
|---|---|---|
| Joint costs | 1,250 | 3,750 |
| Separate costs | 1,300 | 3,800 |
| Salvage value | (300) | (800) |
| Total | 2,250 | 6,750 |
| # Chips | 200 | 500 |
| Cost per unit | $11.25 | $13.5 |

**a.2 Net Realizable Value (NRV) method**

| Product | NRV* | Proportion | X | Joint costs | = | Share of each product |
|---|---|---|---|---|---|---|
| LE-HD | $5,000 | 45.45% | X | 5,000 | = | 2,272.50 |
| LE-LD | $6,000 | 54.55% | X | 5,000 | = | 2,727.50 |
| Total | 11,000 | 100.00% | | | | 5,000 |

* (200 X 30) – (1,300 -300); (500X18) – (3,800 – 800)

| | LE-HD | LE-LD |
|---|---|---|
| Joint costs | 2,272.50 | 2,727.50 |
| Separate costs | 1,300 | 3,800 |
| Salvage value | (300) | (800) |
| Total | 3,272.50 | 5,727.50 |
| # Chips | 200 | 500 |
| Cost per unit | $16.363 | $11.455 |

**b.** AMC will lose $1,500, if the company accepts Peach's offer as oppose to process the EL-LD further as shown below:

| | LE-LD |
|---|---|
| Sales after processing (500 X 18) | 9,000 |
| Sales before (900 X 5) | (4,500) |
| Increase in sales | 4,500 |
| Salvage value (400 X 2) | 800 |
| Processing further costs | (3,800) |
| Net benefit from processing EL-LD further | 1,500 |