**SOLUTION 1**

(a) (i) <u>Production mix where material is limited to 596,000kgs</u>

Produce 40,000 dishes of F using 320,000 kgs
Produce 27,600 dishes of J using <u>276,000</u> kgs
<u>596,000</u> kgs

(ii) <u>Production mix where labour is limited to 480,000 hours</u>

Produce 40,000 of J using 320,000 hours
Produce 26,667 of C using <u>160,000</u> hours
<u>480,000</u> hours

<u>Calculation of contribution/unit</u>

| Dishes | J | F | C | P |
|---|---|---|---|---|
| Selling price | 420 | 360 | 300 | 240 |
| Less: Marginal cost | | | | |
| Material | (100) | (80) | (100) | (120) |
| Labour | (40) | (50) | (30) | (20) |
| Contribution | 280 | 230 | 170 | 100 |

<u>Material as a limiting factor</u>

| Contribution/kg | $\frac{280}{10}$ | $\frac{230}{8}$ | $\frac{170}{10}$ | $\frac{100}{12}$ |
|---|---|---|---|---|
| | = 28 | = 28.75 | = 17 | = 8.3 |
| Ranking | 2nd | 1st | 3rd | 4th |

<u>Labour as a limiting factor</u>

| Contribution/hour | $\frac{280}{8}$ | $\frac{230}{10}$ | $\frac{170}{6}$ | $\frac{100}{4}$ |
|---|---|---|---|---|
| | = 35 | = 23 | = 28.33 | = 25 |
| Ranking | 1st | 4th | 2nd | 3rd |

## SOLUTION 2

<u>Workings</u>

1. Sales at 80% capacity = GH¢6,400,000
   at 100%        = 6,400,000 x 100/80
                  = <u>GH¢8,000,000</u>

2. Sales (export) at 50% capacity = ½ x 8, 000, 000
                                   = 4,000,000
                                   = 4,000,000 x (100-15)%
                                   = <u>GH¢3,400,000</u>

3. Direct material cost for option 2 (100% capacity) :
   GH¢2,000,000 x <u>100</u> = <u>GH¢2,500,000</u>
                        80

4. Direct material cost for option 3 (130% capacity) :
   2,000,000 x <u>130</u> = <u>GH¢3,250,000</u>
                    80

5. Direct labour cost for option 2 (100% capacity) :
   800,000 x <u>100</u> = GH¢<u>1,000,000</u>
                    80

6. Variable old for option 2 (100% capacity) :
   400,000 x <u>100</u> = <u>GH¢500,000</u>
                    80

7. Variable old for option 3 (130% capacity) :
   400,000 x <u>130</u> = <u>GH¢650,000</u>
                    80

PROFIT STATEMENT

OPTION (GH¢ )

| | 1 | 2 | 3 |
|---|---|---|---|
| Sales (Local) | 6,400,000 | 4,000,000 | 6,400,000 |
| Sales (Export) | - | 3,400,000 | 3,400,000 |
| Total sales | 6,400,000 | 7,400,000 | 9,800,000 |
| Direct material | 2,000,000 | 2,500,000 | 3,250,000 |
| Direct labour | 800,000 | 1,000,000 | 1,300,000 |
| Variable olds | 400,000 | 500,000 | 650,000 |
| | 3,200,000 | 4,000,000 | 5,200,000 |
| Contribution | 3,200,000 | 3,400,000 | 4,600,000 |
| Less fixed olds | 2,600,000 | 2,600,000 | 2,800,000 |
| Profit | 600,000 | 800,000 | 1,800,000 |

Conclusion:
Option 3 is the best because it results in the highest profit.

**SOLUTION 3**

Relevant Cost Estimate

| | GH¢ |
|---|---|
| Direct materials and components: | |
| 4000 units of Alfa at GH¢20 per unit (1) | 80,000 |
| 400 units of Beta at GH¢20 per unit (2) | 8,000 |
| Other material components | 25,000 |
| | 113,000 |
| Direct labour (3) | - |
| Overhead: | |
| Dept A (250 hours at GH¢30) (4) | 7,500 |
| Dept B (450 hours at GH¢8) (5) | 3,600 |
| | 124,100 |

1.  It is assumed that using material Alfa on the contract will result in the materials being replaced. Therefore additional opportunity costs to the company will be the replacement costs of the material.

    The alternative uses of the materials are to sell them or to use them as substitute materials. The savings are greater when the materials are used as a substitute. Therefore the company will be worse off by GH¢20 per unit of materials use on the contract. Hence the opportunity cost of Beta is GH¢20 per unit.

2. The company appears to have a temporary excess supply of the labour. The total labour cost will be the same whether or not the contract is undertaken. Therefore the opportunity cost is zero.

3. The company will incur GH¢3600 additional costs if the contract is undertaken.

   Acceptance of the contract will result in the department losing the opportunity of charging out 250 hours at GH¢30 per hour.

<u>Relevant Costs</u>

Relevant costs for decision making are those costs which will be affected by the decision

- They are future costs
- They are cash flows
- They differ between various alternatives
- Past and sunk costs are irrelevant

Examples are incremental costs, opportunity cost etc.

**SOLUTION 4**

(a) <u>Standard product cost for one unit of product BM</u>

| | GH¢ |
|---|---|
| Direct materials (8kg @ GH¢1.5) | 12.00 |
| Direct wages (4 @ 2 hours) | 8.00 |
| Variable overhead (2 hours @ GH¢1) | <u>2.00</u> |
| | <u>22.00</u> |

<u>Workings</u>

(w1)　Actual quantity of materials purchased at
　　　Standard price  = actual cost + favourable material price variance
　　　　　　　　　 = GH¢420,000 + GH¢30,000
　　　　　　　　　 = GH¢450,000
　　　Therefore, standard material price = $\frac{450,000}{300,000}$ = GH¢1.5

(w2)   Material usage variance = <u>GH18,000</u> = <u>12,000kg</u>
                                             GH¢1.5

Therefore standard quantity for actual production = 300,000 – 12,000kg = <u>288,000kg</u>

Therefore standard quantity per unit = 288,000 ÷ 3600 = <u>8kg</u>

(w3)   Actual hours worked at standard rate = 272,000 – 16000 = GH¢256,000

Therefore standard rate per hour = <u>GH¢256,000</u>
                                                      64,000 hours
                                         = <u>GH¢4</u>

(w4)   Labour efficiencies variance = GH¢32,000 ÷ 4
                                             = 8,000 hours

Therefore standard hours for actual production = 64,000 + 8,000 = <u>72,000 hours</u>

Standard hour per unit = 72,000 – 36,000 = <u>2hours</u>

(w5)   Actual hours worked at the standard variable
       Overhead rate = (actual variable overheads – favourable  expense variance)
                = 76,000 – 12,000 = 64,000
       Therefore standard variable overhead rate:
                = 64,000 ÷ 64,000 hours = <u>GH¢1.00</u>

(b) Possible Causes:

**(i)      Material usage variances:**
-   Careless handling of materials by production staff
-   The purchase of inferior material
-   Pilferage
-   Changes in quality control requirement
-   Changes in methods of production

**(ii)     Material price variances:**
-   Actual prices may exceed standard prices because of a change in market conditions that causes a general price increase.
-   Adverse variance may reflect a failure by the purchasing department to seek the most advantageous sources of supply.
-   Favourable price variance might be due to the purchase of inferior quality materials.

**(iii)    Wage rate variance:**
-   Negotiated increase in wage rates not yet having been reflected in the standard wage rate.
-   Where a standard is used that represents a single average rate for a given operation performed by workers who are paid at several different rates.

**(iv)    Labour efficiency variance:**
-   Inferior quality materials
-   Different grades of labour
-   Failure to maintain machinery in proper condition
-   The introduction of new equipment or tools
-   Changes in the production processes.

**SOLUTION 5**

(a) (i) <u>Sales quantity and value budget</u>

| Product: | SI | MI | LAR | Total |
|---|---|---|---|---|
| Sales quantities | 1200 | 2400 | 1800 | |
| Selling prices | GH¢80 | GH¢96 | GH¢112 | |
| Sales value | GH¢96,000 | GH¢230,400 | GH¢201,600 | GH¢528,000 |

(ii)    <u>Production Quantities Budget</u>

| Product: | SI | MI | LAR |
|---|---|---|---|
| Sales quantities | 1200 | 2400 | 1800 |
| Add closing stock | 1320 | 1980 | 660 |
| | 2520 | 4380 | 2460 |
| Less: opening stock | 1200 | 1800 | 600 |
| Units to be produced | 1320 | 2580 | 1860 |

(iii)　Material Usage Budget (quantities)

Production quantities                          Materials

| | Unit per product | MA Total | Unit per product | MB Total | Unit per product | MB Total |
|---|---|---|---|---|---|---|
| SI 1320 | 5 | 6,600 | 3 | 3,960 | 1 | 1,320 |
| MI 2580 | 4 | 10,320 | 4 | 10,320 | 3 | 7,740 |
| LAR 1860 | 3 | 5,580 | 2 | 3,720 | 2 | 3,720 |
| Usage in quantities | | 22,500 | | 18,000 | | 12,780 |

(iv)　Material Purchases Budget (quantities and value)

| | MA | MB | MC | Total GH¢ |
|---|---|---|---|---|
| Material usage | 22,500 | 18,000 | 12,780 | |
| Add closing stock | 37,440 | 28,500 | 17,280 | |
| | 59,940 | 46,800 | 30,060 | |
| Less: opening stock | 31,200 | 24,000 | 14,400 | |
| Purchase in quantities | 28,740 | 22,500 | 15,660 | |
| Price per unit | GH¢3 | GH¢5 | GH¢8 | |
| | GH¢86,220 | GH¢114,000 | GH¢125,280 | 325,500 |

(b) The principal budget factor is also known as the limiting factor or key factor. It is defined as the factor which at a particular time, or over a period, will limit the activities of an undertaking. The limiting factor is usually the level of demand for the products or services of the undertaking but it could be a shortage of one of the productive resources. Example, skilled labour, customer base, level of ICT, high interest rate, reserve ratios.