1. Material Variance Calculation

Solution:

- **SQ (Standard Quantity) = 1000 × 4 = 4000 sq. ft**
- **SP = Rs. 5**
- **AQ = 4300 sq. ft**
- **AP = Rs. 5.50**

Calculations:

- **MCV = (4000 × 5) – (4300 × 5.50) = 20,000 – 23,650 = –Rs. 3,650 (Unfavorable)**
- **MUV = (4000 – 4300) × 5 = –300 × 5 = –Rs. 1,500 (Unfavorable)**
- **MPV = (5 – 5.50) × 4300 = –0.50 × 4300 = –Rs. 2,150 (Unfavorable)**

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2. Material Variance Calculation

Solution:

- **SQ = 100 × 3 = 300 lbs**
- **SP = Rs. 2**
- **AQ = 250 lbs**
- **AP = Rs. 5.50**

Calculations:

- **MCV = (300 × 2) – (250 × 5.50) = 600 – 1375 = –Rs. 775 (Unfavorable)**
- **MUV = (300 – 250) × 2 = 50 × 2 = Rs. 100 (Favorable)**
- **MPV = (2 – 5.50) × 250 = –3.50 × 250 = –Rs. 875 (Unfavorable)**

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3. Material Variance Calculation with Opening & Closing Stock

Solution:

- **SQ = 80 × 25 = 2000 units**
- **SP = Rs. 2**
- **AQ (Used) = 3000 – 500 = 2500 units**
- **AP = Rs. 9000 / 3000 = Rs. 3 per unit**

Calculations:

- **MCV = (2000 × 2) – (2500 × 3) = 4000 – 7500 = –Rs. 3,500 (Unfavorable)**

- **MUV = (2000 – 2500) × 2 = –500 × 2 = –Rs. 1,000 (Unfavorable)**
- **MPV = (2 – 3) × 2500 = –1 × 2500 = –Rs. 2,500 (Unfavorable)**

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4. Material Variance Calculation (Alternative Case)

Solution:

- **SQ = 1000 × 1.5 = 1500 sq. ft**
- **SP = Rs. 0.15**
- **AQ = 1020 × 1.3 = 1326 sq. ft**
- **AP = Rs. 0.18**

Calculations:

- **MCV = (1500 × 0.15) – (1326 × 0.18) = 225 – 238.68 = –Rs. 13.68 (Unfavorable)**
- **MUV = (1500 – 1326) × 0.15 = 174 × 0.15 = Rs. 26.10 (Favorable)**
- **MPV = (0.15 – 0.18) × 1326 = –0.03 × 1326 = –Rs. 39.78 (Unfavorable)**

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5. Large-scale Material Variance Calculation

Solution:

- **SQ = 210,000 × (100/70) = 300,000 kg**
- **SP = Rs. 1**
- **AQ = 280,000 kg**
- **AP = Rs. 252,000 / 280,000 = Rs. 0.90 per kg**

Calculations:

- **MCV = (300,000 × 1) – (280,000 × 0.90) = 300,000 – 252,000 = Rs. 48,000 (Favorable)**
- **MUV = (300,000 – 280,000) × 1 = 20,000 × 1 = Rs. 20,000 (Favorable)**
- **MPV = (1 – 0.90) × 280,000 = 0.10 × 280,000 = Rs. 28,000 (Favorable)**

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6. Labour Variance Calculation

Solution:

- **Standard Hours (SH) = 1000 × 2.5 = 2500 hours**
- **Standard Rate (SR) = Rs. 2**
- **Actual Hours (AH) = 2000 hours**

- **Actual Rate (AR) = Rs. 4,500 / 2000 = Rs. 2.25**
- **Idle Time = 2000 × 25% = 500 hours**

Calculations:

- **LCV = (2500 × 2) – (2000 × 2.25) = 5000 – 4500 = Rs. 500 (Favorable)**
- **LUV = (2500 – 2000) × 2 = 500 × 2 = Rs. 1000 (Favorable)**
- **LRV = (2 – 2.25) × 2000 = –0.25 × 2000 = –Rs. 500 (Unfavorable)**
- **ITV = 500 × 2 = Rs. 1000 (Favorable)**

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7. Labour Variance Calculation (Alternative Case)

Solution:

- **SH = 700 × 3 = 2100 hours**
- **SR = Rs. 6**
- **AH = 2000 hours**
- **AR = Rs. 14,000 / 2000 = Rs. 7**
- **Idle Time = 50 hours**

Calculations:

- **LCV = (2100 × 6) – (2000 × 7) = 12,600 – 14,000 = –Rs. 1,400 (Unfavorable)**
- **LUV = (2100 – 2000) × 6 = 100 × 6 = Rs. 600 (Favorable)**
- **LRV = (6 – 7) × 2000 = –1 × 2000 = –Rs. 2,000 (Unfavorable)**
- **ITV = 50 × 6 = Rs. 300 (Unfavorable)**