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SUGGESTED SOLUTION

FINAL EXAM

SUBJECT- SCM AND PE

Test Code - FNJ 7414

BRANCH - () (Date :)

Head Office : Shraddha, 3rd Floor, Near Chinai College, Andheri (E), Mumbai – 69.

Tel : (022) 26836666

Answer 1:

- (i) **HAL's Control System** HAL's current control system is 'focused exclusively' on the manufacturing process and its efficiency even though HAL is also a retailer and installer of industrial ACs. It is suitable for HAL's control system to monitor manufacturing efficiency with the help of the three variances: material usage, material price and manufacturing labour efficiency. No reasons have been given for focusing on these three variances and there may be other variances which can provide useful control information that are not currently computed for example, labour rate and material yield. Although HAL uses standard costing, it is unclear whether it calculates product costs. A lack of product costs computation may be the reason that it was shocked about its 2017 profit margin. Standard costing could be in criticism for misdirecting management's attention. Thus, in the case of a 'Summer – Cool' AC where the highest standards of materials are used, it is pertinent that the quality of the finished product is not compromised. Therefore, it might be proper to accept an unfavourable material price variance to maintain the product's standards. Variance analysis should not be done in isolation but a holistic view needs to be taken about HAL's operations and the current control system may not lead to this. HAL is not currently controlling and monitoring aspects which are important for competitive success. HAL's Critical Success Factors have not been identified yet. There is monthly reporting of variances but in addition to this, there should also be follow – up actions for outcome resulting from these reports. However, a month is not inevitably the relevant reporting period for all aspects of HAL's business. If there is a production problem leading to excessive materials wastages, a month is too long time to wait before remedial action are taken. Therefore, real time or coexistent reporting may be more relevant for manufacturing operations. A major deficiency of HAL's control systems is that they do not extend to retailing and installation activities. The 'Summer' installation teams are incentivized to complete ACs which could be good for their productivity. However, there is a high level of complaints associated with their work. As there is no evident means of monitoring the installation team's work, the reasons of the complaints cannot be identified.
- (ii) **Critical Success Factors (CSF)** are elements tied to the strategy of business and they represent objectives that business is trying to achieve, as a corporation, as a department or as a business unit. Critical success factors may vary over time and may include items like employee attitudes, manufacturing flexibility etc. There are a range of CSF's which could be appropriate for HAL. They include :
- CSF : Installations Quality** There are different quality expectations for the two ACs and there have been different levels of quality achieved, can be seen in the historic pattern of complaints. This strongly implies that the quality of installation should be tracked as a separate CSF for each AC. This CSF is important for HAL due to cost implications of rectifications and guarantee claims. It is also important to consider that because of the effect that poor quality will have on HAL's future business.
- CSF : Customer Satisfaction** Like quality, this CSF will need to be monitored separately for each AC. Customer satisfaction encompass the complete life of a transaction beginning with the initial enquiry about a purchase and continuing after installation for the life of the AC. Customer satisfaction will have an influence on HAL's future business which is dependent, in part, on repeat orders and recommendations. This CSF will also show the market's view of HAL's brand.

CSF: Brand Performance HAL has two distinct brands. They are directed at different market segments and have different associated attributes. 'Summer' ACs offer limited choice to the customer and retail, on average, for Rs. 36,000. HAL would like to maintain this business at its present level (7,000 ACs a year minimum) Rs. 252 million revenue. HAL needs to ascertain where this brand is situated in its life – cycle and what marketing activities may be required to support it. The 'Summer – Cool' brand is aimed at a different market segment and HAL would like to grow this aspect of its business which produces revenue of Rs. 504 million. The success of both brands is important for the continual success of HAL and this CSF indicate a complete view of performance.

CSF : Manufacturing Excellence HAL manufactures all the ACs which it sells and installs. Manufacturing must be a substantial part of HAL's total costs and a significant contributor to profitability. Currently, HAL monitors some limited aspects of manufacturing through its control system. However, there are many other aspects which have not been reported upon, for example – innovation, labour absenteeism, manufacturing flexibility and investment in technology. This CSF is much broader than the current control system. It also assists in searching for competitiveness.

- (iii) **Standard Costing and Reporting System** HAL may be required to abandon or modify its standard costing and reporting system. The rationale behind this is that the current control system might lead to an inappropriate emphasis being placed on certain aspects of performance. It is noteworthy that the installations for 'Summer' AC is causing a substantial level of complaints whereas there has never been a complaint made about a 'Summer Cool' AC. It could be that the different remuneration arrangements for the ACs' installation teams have led to this and as the complaint level is an important aspect of the CSF i.e. Customer Satisfaction, HAL may need to modify its remuneration arrangements. It should also reckon whether it would be benefited from a broader range of variance reporting, for example, it may find reporting useful to report on labour rates and material yield. For all CSFs, HAL will need to determine the appropriate reporting intervals. Although it is useful to synchronize this with the accounting reporting cycle, CSFs and KPIs do not necessarily coexist with accounting period ends. Some KPI's may require to be reported in real – time, for example, material wastage, others may be of a longer duration like Customer Satisfaction. There is a strong argument for disassociation of the CSFs reporting from the financial reporting cycles.

Answer 2:

(A)

- (i) **Identification of Bottleneck** : Installation of cameras is the bottleneck in the operation cycle. The annual capacity for manufacturing and installation are given to be 750 camera units and 500 camera units respectively. Actual capacity utilization is 500 camera units, which is the maximum capacity for the installation process. Although, ZPS can additionally manufacture 250 camera units, it is constrained by the maximum units that can be installed. Therefore, ZPS should focus on improving the installation process.
- (ii) **Improving Capacity of Installation Technique** : Every camera sold increases the through put contribution by Rs. 1,500 per camera unit (sale price Rs. 2,500 per camera unit less direct material cost Rs. 1,000 per camera unit). By improving the current installation technique an additional 50 camera units can be sold and installed. This would involve total additional expenditure of Rs. 40,000. Hence, the incremental benefit would be :

Particulars	Amt. (Rs.)
Increase in throughput contribution (additional 50 camera units Rs. 1,500 per camera unit)	75,000
Less : Increase in total expenditure	40,000
Incremental benefit	35,000

Since the annual incremental benefit is Rs. 35,000 per annum, ZPS should implement this improvement to installation technique, the current bottleneck operation.

- (iii) **Improving Manufacturing Capacity** : Every camera sold increases the throughput contribution by Rs. 1,500 per camera unit (sale price Rs. 2,500 per camera unit less direct material cost Rs. 1,000 per camera unit). By improving the current manufacturing technique an additional 150 camera units can produced. This would involve a cost Rs. 100 per camera unit due to necessary changes to made in direct materials. Therefore, number of units manufactured can increase to 650 camera units. However, production of 150 camera units will not translate into additional sales, because each sale also requires installation by ZPS. In a year only 500 camera installations can be made, leading to an inventory pile up of 150 camera units. This is detrimental to ZPS, since it does not earn any contribution by holding inventory. Therefore, ZPS should not go ahead with the proposal to improve the manufacturing technique.

(B)

(i) ROI

Division 'Y'

Controllable Profit = Rs. 5,290K

Net Assets = Rs. 19,520k + Rs. 4,960k – Rs. 5,920k = Rs. 18,560K

ROI = 28.5%

Division 'D'

Controllable profit = Rs. 3,940K

Net Assets = Rs. 29,960K + Rs. 6,520K – Rs. 2,800K = Rs. 33,680K

ROI = 11.7%

In computation of ROI of both division, controllable profit has been taken into consideration. The reason behind this is that the Head Office costs are not controllable and responsibility accounting considers that managers should only be held responsible for costs over which they have control. The assets figures being used also depend on the same principal. Figures of current assets and the current liabilities have been taken into consideration as they are such items over which managers have complete control.

(ii) Bonus

Bonus to be paid for each percentage point = Rs. 7,20,000 × 3% = Rs. 21,600

Maximum Bonus = Rs. 7,20,000 × 20% = Rs. 1,44,000.

Division 'Y'

ROI = 28.5% (16 whole percentage points above minimum ROI)

16 × Rs. 21,600 = Rs. 3,45,600

Therefore, manager will be paid the bonus of Rs. 1,44,000 (max.)

Division 'D'

ROI = 11.7% (Zero, percentage point above minimum)

Therefore Bonus = NIL

(iii) Discussion

FAI will not receive any bonus since he has not earned any point above minimum percentage. This is due to the large asset base on which the ROI figure has been computed. Total assets of Division 'D' are almost double the total assets of Division 'Y'. The major reason behind this is that Division 'D' invested Rs. 13.6 million in new equipment during the year. If this investment were not made, net assets would have been only Rs. 20.08 million and the ROI for Division 'D' would have been 19.62% resulting in payment of a bonus Rs. 1,44,000 (7 × Rs. 21,600 = Rs. 1,51,200; subject to maximum of Rs. 1,44,000) rather than the nothing. FAI is being penalized for making decisions which are in the best interests of his division. It is very surprising that he decided to invest where he knew that he would receive lesser bonus subsequently. He acted in the best interests of the BYD altogether. On the other hand, HAI has taken benefit from the fact that he has not invested anything even though it was needed for computer system updation. This is an example of sub – optimal decision making.

Further, Division 'Y's trade payables are over double those of Division 'D'. In part, one would expect this due to higher sales (almost 66% more than Division 'D') and low cash levels at Division 'Y'. Higher trade payable leads to reduction in net assets figures. The fact that BYD is rewarding HAI with bonus, even though relationships with suppliers may be badly affected, is again a case of sub – optimal decision making.

If the profit margin (excluding head office cost) as percentage of sales is calculated, it comes to 18.24% for Division 'Y' and 22.64% for Division 'D'. Therefore it can be seen that Division 'D' is performing better if capital employed is ignored. ROI is simply making the division 'D's performance worse.

FAI might feel extremely disappointed by getting nothing and in the future, he may opt to postpone the investment to increase the bonus. Non – investing in new technology and

equipment will mean that the BYD will not be kept updated with industry changes and its overall future competitiveness will be affected.

Briefly, the use of ROI is resulting in sub – optimal decision making and a lack of goal congruence i.e. what is good for the managers is not good for the company and vice versa. Fortunately, Division ‘D’'s manager still seems to be acting for the benefit of the BYD but the other manager is not. The fact that one manager is receiving a much bigger bonus than the other is not justifiable here and may result in conflict in long run. This is disappointing for the company especially in the situation when the divisions need to work in unison.

Answer 3:

(A)

(i) Statement of ‘Expected Quality Costs’

Particulars	Current Situation (Rs.)	Proposed Situation (Rs.)
Prevention Costs	---	4,50,000
Appraisal Costs	---	50,000
External Failure Costs	3,20,000	2,35,120
Internal Failure Costs	7,55,556	3,91,538
Total Quality Costs	10,75,556	11,26,658

Workings

External Failure Cost

Particulars	Current Situation	Proposed Situation
Customer's Demand ... (A)	28,000 units	28,000 units
Number of units Dispatched to Customers ... (B)	32,000 units	30,939 units
(28000 units / 87.5%) , (28000 / 90.5%)		
Number of units Replaced (A) ... (B) –	4,000 units	2,939 units
External Failure Cost {4,000 units × Rs.(35+25+15+5)}; {2,939 units × Rs.(35+25+15+5)}	Rs.3,20,000	Rs.2,35,120

Internal Failure Cost

Particulars	Current Situation	Proposed Situation
Number of units Dispatched to Customers ... (A)	32,000 units	30,939 units
Number of units Produced & Rejected ... (B) ($\frac{32,000 \text{ units}}{80\%}$) ; ($\frac{30,939 \text{ units}}{90\%}$)	40,000 units	34,377 units
Number of units Discovered Faulty ... (B) – (A)	8,000 units	3,438 units
Cost of Faulty Production ... (D) {8,000 units × Rs.(35+25+15)}; {3,438 units × Rs.(35+25+15)}	Rs.6,00,000	Rs.2,57,850

Material Scrapped $\left(\frac{40,000 \text{ units}}{90\%} \times 10\% \right)$; $\left(\frac{34,377 \text{ units}}{90\%} \times 10\% \right)$	4,444.44 units	3,819.67 units
Cost of Material Scrapped ... (E) {4,444.44 units × Rs.35}; {3,819.67 units × Rs.35}	Rs.1,55,556	Rs.1,33,688
Internal Failure Cost ... (D)+(E)	Rs.7,55,556	Rs.3,91,538

(ii) Recommendation

On purely *financial grounds* the company should not accept the proposal because there is an increase of Rs.51,102 in quality costs. However there may be *other factors* to consider as the company may enhance its reputation as a company that cares about quality products and this may increase the company's market share.

On balance the company should accept the proposal to improve its *long-term* performance.

(B)

Appropriate Pricing Policy	
(i)	Penetration Pricing
(ii)	Market Price or Price Just Below Market Price
(iii)	Skimming Pricing
(iv)	Any Cash Realizable Value*

(*) this amount decreases every passing day.

Answer 4:

(A)

(i) Impact of the Proposal by the Japanese Manufacturer to Supply Components for Printers and Scanners to the Indian Subsidiary of the SCI.

On Indian Subsidiary of SCI

Particulars	Amount Rs.
Cost of Purchase from the Chinese Manufacturer :	
Invoiced Amount {(1,50,000 units × ¥ 30) × Rs. 9.80}	4,41,00,000
Add : Total Custom Duty (Rs. 4,41,00,000 × 29.5%)	1,30,09,500
Total Cost of Purchase from the Chinese Manufacturer (A)	5,71,09,500
Cost of Purchase from Japanese Manufacturer in India :	
Invoice Amount (1,50,000 units × Rs. 320)	4,80,00,000
Total Cost of Purchase from Japanese Manufacturer in India (B)	4,80,00,000
Savings on Purchase Cost Before Corporate Taxes (A) – (B)	91,09,500
Less : Corporate Tax @ 34%	30,97,230
Savings after Corporate Taxes	60,12,270

On Chinese Subsidiary of SCI

Particulars	Amount (Rs.)
Loss of Contribution [$\{(1,50,000 - 1,20,000 \text{ units}) \times \text{¥} (30 - 20)\} \times \text{Rs. } 9.80$]	29,40,000
Add : Excise Duty on Local Sale – Chinese Manufacturer [$\{(1,20,000 \text{ units} \times \text{¥} 30) \times 10\% \} \times \text{Rs. } 9.80$]	35,28,000
Total Loss Before Corporate Taxes	64,68,000
Less : Tax Savings on the Losses (Rs. 64,68,000 × 25%)	16,17,000
Net Loss after Corporate taxes	48,51,000

On SCI Group

Particulars	Amount (Rs.)
Saving from Indian Subsidiary	60,12,270
Loss from Chinese Subsidiary	48,17,000
Net Benefit to SCI Group	11,61,270

From the above analysis it can be seen that the proposal from the Japanese manufacturer in India is beneficial for the SCI as it give a net benefit of Rs. 11,61,270.

(ii) The SCI need to consider various other issues before reaching at a final decision of accepting the proposal of the Japanese manufacturer in India. The few suggestive issues that should be considered are as follows :

- The longevity of the proposal of the Japanese manufacturer : Whether Japanese manufacturer will supply the components in the future also. For this purpose a long term agreement between the Indian Subsidiary of SCI and Japanese manufacturer in India needs to be entered.
- Certainty of the fiscal policy in India : The Japanese manufacturer will not be able to supply the component at the present price if the fiscal policy of India will change in the future.
- Repatriation of Profit earned in India : Though the Indian subsidiary is making profit but it depends on the Government policy on the repatriation of profit from Indian to USA.
- Operating conditions in China : The SCI has to make sure that the Chinese subsidiary is operating profitably and able to use the spare capacity in the future as well.
- The fiscal policy in China : If the Government of China liberalize its fiscal policies in China in future then the manufacturing cost will be cheaper than the today's cost.

[Apart from above suggestive points the foreign relations and other tax treaties and accords should also be kept in consideration.]

(B) Workings

Statement Showing 'Inventory Holding Cost' under Current System

Particulars	Jan	Feb	Mar	Apr	May	Jun
Opening Inventory* (A)	-	650	690	430	880	1,030
Add : Production *	3,800	3,800	3,800	3,800	3,800	3,800
Less : Demand *	3,150	3,760	4,060	3,350	3,650	4,830

Closing Inventory* (B)	650	690	430	880	1,030	-
Average Inventory $\left(\frac{A+B}{2}\right)$	325	670	560	655	955	515
Inventory Holding Cost @ Rs.70	22,750	46,900	39,200	45,850	66,850	36,050

(*) in terms of standard labour hours

Inventory Holding Cost for the six months = Rs. 2,57,600

= (Rs. 22,750 + Rs. 46,900 + Rs. 39,200 + Rs. 45,850 + Rs. 66,850 + Rs. 36,050)

Calculation of Relevant Overtime Cost under JIT System

Particulars	Jan	Feb	Mar	Apr	May	Jun
Demand *	3,150	3,760	4,060	3,350	3,650	4,830
Production *	3,150	3,760	4,060	3,350	3,650	4,830
Normal Availability*	3,800	3,800	3,800	3,800	3,800	3,800
Shortage (= Overtime*) (C)	--	---	260	--	---	1,030
Actual Overtime Hours $\left(\frac{C}{0.95}\right)$	---	---	273.68	-----	-----	1,084.21
Overtime Payment @ Rs. 159.50 [110 + 45%]	---	-----	43,652	-----	-----	1,72,931

(*) in terms of standard labour hours

Total Overtime Payment = Rs. 2,16,583

(Rs. 43,652 + Rs. 1,72,931)

Therefore, saving in JIT System = Rs. 2,57,600 – Rs. 2,16,583 = Rs. 41,017

Comments

Though YPL is saving Rs. 41,017 by changing its production system to Just – in – time but it has to consider other factors as well before taking any final call which are as follows :-

- (i) YPL has to ensure that it receives materials from its suppliers on the exact date and at the exact time when they are needed. Credentials and reliability of supplier must be thoroughly checked.
- (ii) To remove any quality issues, the engineering staff must visit supplier's sites and examine their processes, not only to see if they can reliably ship high – quality parts but also to provide them with engineering assistance to bring them up to a higher standard of product.
- (iii) YPL should also aim to improve quality at its process and design levels with the purpose of achieving "Zero Defects" in the production process.
- (iv) YPL should also keep in mind the efficiency of its work force. YPL must ensure that labour's learning curve has reached at steady rate so that they are capable of performing a variety of operations at effective and efficient manner. The workforce must be completely retained and focused on a wide range of activities.

Answer 5:

(A)

(i) **Product Wise Profitability as per Original Allocation Methodology**

(Figures in Rs. per kilogram of fertilizer produced)

Particulars	Grade A	Grade B	Total
Selling price	280	400	680
Direct Material (Refer Table 1)	114	186	300
Direct Labour (Refer Table 1)	76	124	200
Overheads (allocated equally)	75	75	150
Total Expenses	265	385	650
Profit	15	15	30
Profitability	5.36%	3.75%	×

Table 1 Allocation of Direct Materials and Labour as per Cost Centre and Product

Particulars	CC1			CC2			CC3			Total for the company		
	A	B	CC Total	A	B	CC Total	A	B	CC Total	Gr. A	Gr. B	Grand Total
Direct material	27	63	90	60	60	120	27	63	90	114	186	300
Direct Labour	18	42	60	40	40	80	18	42	60	76	124	200

→ Product Wise Profitability (activity based costing using environmental management accounting) requires the following steps :

1. Overhead expenses of Rs. 150 per kilogram of fertilizer produced be first bifurcated into incinerator costs and other overhead costs.
2. Incinerator costs of Rs. 90 per kilogram of fertilizer needs to be allocated first to the cost centres. This is done based on the waste generated at each cost centre. The individual cost allocated to each cost centre is again allocated to products based on the waste generated at each cost centre by each product. Refer part a of table 2 for detailed calculations.
3. As mentioned in the problem, other overhead costs are allocated to each product at each cost centre level equally. Refer part b of table 2 for detailed calculations.
4. The above allocations to each product at a cost centre level is then summed up to get the product wise overhead cost allocation. Refer part c of table 2 for detailed calculations.

Accordingly, the **Revised Product Profitability** would be as follows :

(Figures in Rs. per kilogram of fertilizer produced)

Particulars	Grade A	Grade B	Total
Selling price	280	400	680
Less : Direct Material (Refer table 1)	114	186	300
Less : Direct Labour (refer table 1)	76	124	200
Less : Overheads (refer table 2)	66	84	150
Profit	24	6	30
Profitability	8.57%	1.50%	×

Table 2 Allocation of Overhead Expenses to each Cost Centre and Product

(Figures in Rs. per kilogram of fertilizer produced)

Product Waste Produced (in tonnes per annum)	CC1	CC2	CC3	Total
Grade A	2	3	1	6
Grade B	2	2	5	9
Total Waste (in tonnes)	4	5	6	15
Incinerator Cost Allocated to Cost Centres (based on waste generated)	24	30	36	90
Other Overhead Expenses	20	20	20	60
Total Cost Centre Wise Overhead Cost	44	50	56	150
Part A : Allocation of Incinerator Cost from Cost Centre to each product (based on waste produced at each cost centre by each product)				
Product	CC1	CC2	CC3	Total
Grade A	12	18	6	36
Grade B	12	12	30	54
Total Incinerator Cost	24	30	36	90
Part B : Allocation of Other Overhead Cost from Cost Centre to each product				
Product	CC1	CC2	CC3	Total
Grade A	10	10	10	30
Grade B	10	10	10	30
Total Other Overhead Cost	20	20	20	60
Part C : Total Overhead Cost (Cost centre and product Wise i.e. part a + b)				
Product	CC1	CC2	CC3	Total
Grade A	22	28	16	66
Grade B	22	22	40	84
Total Overhead Cost	44	50	56	150

Summarizing Product profitability as per both methods :

Product	(Profit in Rs. per kg of fertilizer produced)		Profit %	
	Original Method	ABC (as per EMA) Method	Original Method	ABC (as per EMA) Method
Grade A	15	24	5.36%	8.57%
Grade B	15	6	3.75%	1.50%

(B)

Statement showing Reconciliation Between Budgeted [F.Y. 2015 – 16] & Actual Profit [F.Y. 2016 – 17]

Particulars	(Rs. in lacs)	(Rs. in lacs)
Budgeted Profit		200.00
Sales Contribution Variances :		
Price	427.50 (F)	
Volume	25(A)	402.50(F)
Direct Material Variances :		
Price	307.50(A)	

Usage	150.00 (A)	457.50(A)
Variable Overheads Variances :		
Expenditure	25.00 (A)	
Efficiency	25.00 (A)	50.00 (A)
Fixed Overheads Variances :		
Expenditure	67.50 (A)	
Volume	N.A.	67.50 (A)
Actual Profit		27.50

Computation of Variances (Rs. In Lacs)

Sales Variances (W.N.1)

$$\begin{aligned}
 \text{Price Variance} &= \text{Actual Sales} - \text{Standard Sales} \\
 &= \text{Rs. } 3,277.50 - \text{Rs. } 2,850.00 \\
 &= \text{Rs. } 427.50 \text{ (F)}
 \end{aligned}$$

$$\begin{aligned}
 \text{Volume Variance} &= \text{Standard Sales} - \text{Budgeted Sales} \\
 &= \text{Rs. } 2,850.00 - \text{Rs. } 3,000.00 \\
 &= \text{Rs. } 150 \text{ (A)}
 \end{aligned}$$

Sales Contribution Variances

$$\text{Sales Contribution} = \text{Sales Price Variance}$$

$$\text{Price Variance} = \text{Rs. } 427.50 \text{ (F)}$$

$$\text{Sales Contribution} = \text{Sales Volume Variance} \times \text{Budgeted PV Ratio}$$

$$\begin{aligned}
 \text{Volume Variance} &= \text{Rs. } 150 \text{ (A)} \times \left(\frac{\text{Rs. } 200 + \text{Rs. } 300}{\text{Rs. } 3,000} \right) \\
 &= \text{Rs. } 25 \text{ (A)}
 \end{aligned}$$

Material Variance (W.N.2)

$$\begin{aligned}
 \text{Material Price Variance} &= \text{Standard Cost of Actual Quantity} - \text{Actual Cost} \\
 &= \text{Rs. } 2,050.00 - \text{Rs. } 2,357.50 \\
 &= \text{Rs. } 307.50 \text{ (A)}
 \end{aligned}$$

Material Usage Variance

$$\begin{aligned}
 &= \text{Standard Cost of Standard Quantity for Actual Output} - \\
 &\quad \text{Standard Cost of Actual Quantity} \\
 &= \text{Rs. } 1900 - \text{Rs. } 2050 \\
 &= \text{Rs. } 150 \text{ (A)}
 \end{aligned}$$

Variable Overhead Variances (W.N.3)

Expenditure Variance

$$= \text{Budgeted Variable Overheads for Actual Hours} - \text{Actual Variable Overheads}$$

OR

$$= \text{Std. Rate per unit} \times \text{Expected Output for Actual Hours Worked} - \text{Actual Variable Overheads}$$

$$= \text{Rs. 500} - \text{Rs. 525}$$

$$= \text{Rs. 25(A)}$$

Efficiency Variances

$$= \text{Standard Variable Overheads for Production} - \text{Budgeted variable Overheads for Actual hours}$$

OR

$$= \text{Std. Rate per unit} \times \text{Actual Output} - \text{Std. Rate per unit} \times \text{Expected Output for Actual Hours Worked}$$

$$= \text{Rs. 475} - \text{Rs. 500}$$

$$= \text{Rs. 25(A)}$$

Fixed Overhead Variances (W.N. 4)

$$\text{Expenditure Variance} = \text{Budgeted Fixed Overheads} - \text{Actual Fixed Overheads.}$$

$$= \text{Rs. 300.00} - \text{Rs. 367.50}$$

$$= \text{Rs. 67.50 (A)}$$

Working Notes (Rs. in lacs)

Note – 1 :

Sales in F.Y. 2016 – 2017	3,277.50
Less : Increase due to price rise [Rs. 3,277.50 lacs × 15/115]	427.50
Sales in F.Y. 2016 – 2017 at F.Y. 2015 – 2016 Prices [Standard Sales]	2,850.00
Sales in F.Y. 2015 – 2016	3,000.00
Fall in Sales in F.Y. 2016 – 2017 [Rs, 3,000 lacs – Rs. 2,850 lacs]	150.00
Percentage fall	5%

Note – 2 :

Material Cost in F.Y. 2015 – 16	2,000.00
Less : 5% for Decrease in Volume	100.00
'Standard Material Usage' at F.Y. 2015 – 16 Prices (Standard Cost of Standard Quantity for Actual output)	1,900.00
Actual Material Cost F.Y. 2016 – 2017	2,357.50
Less : 15% Increase in Prices [Rs. 2,357.50 lakhs × 15/115]	307.50
Actual Materials Used, at F.Y. 2015 – 2016 Prices (Standard Cost of Actual Quantity)	2,050.0

Note – 3 :

Variable Overheads Cost in F.Y. 2015 – 16	500.00
Less 5% due to fall in Volume of Sales in F.Y. 2016 – 17	25.00
“Standard Overheads for Production” in F.Y. 2016 – 17	475.00
Actual Variable Overheads Incurred in F.Y. 2016 – 17	525.00
Less : 5% for Increase in Price [Rs. 525 lacs × 5 / 105]	25.00
Amount Spent in F.Y. 2016 – 17 at F.Y. 2015 – 16 Prices (Budgeted Variable Overheads for Actual Hours)	500.00

Answer 6:**(A)****Analysis of Issue**

It appears that GBTCL has been badly hit by the weather – high rain in July and August have led to a slump in business. Revenue have seen a fall of 18% over the budgeted figure. Direct Material (most of the fuel) is 21% of the Sales (compared to 12% of budgeted level) because of hike in fuel price. Variable Overheads are almost same. However, interestingly, there is a saving of Rs.1,50,000 in Operating Overheads as compared to the budgeted figure after catering additional Operational Expenses of Rs.22,00,000 (for removal of milky appearance etc.). Furthermore, there is reduction in Marketing & Administration Cost. The ratio of Salary to Sales rose to 40% in 2018 from 36% (as budgeted). This appears to be atypical. Instead, there should be a cut in this ratio due to slump in business.

Award of bonus in case of losses is not justified and managers should be held accountable for their operations. However, they should not be held accountable for the *events beyond their control*. A manager cannot control movements in fuel price, yet he/ she is supposed to have the most information and he/ she is expected to correctly forecast movements in the prices of fuel. Managers shouldn't be penalized for the *uncontrollable events*.

Accordingly, in GBTCL, there should be revision in the budget to account uncontrollable events. Refer Table-3.

Revised Budgeted Income Statement (Rs.'000)

Revenue*	94,833
Less:	
Variable Costs-	
Direct Material** (Fuel, Lubricants, and Sundries)	19,879
Direct Labour	33,750
Variable Overheads	6,417
Fixed Costs-	
Operating Overheads (Buses, Garage, Salaries)	20,300
Marketing and Administration	10,700
Profit/ (Loss) before taxes	3,787

Tabel-3

*10 months revenue; ** at actual price levels

The Revised Profit Margin has come down to 4% as against the Target Profit Margin of 20%. This clearly indicates that the performance was benchmarked against the higher target. If original budget figure is used to measure the performance, it will punish employees for the reason which are beyond their control.

GBTCL is not too far away from Revised Profit Margin. Therefore, at least some bonus may be considered to be awarded to the employees which may create more *employee loyalty* and may be beneficial for long term.

Further, *continuous monitoring* of Budget Performance (achievement/ failure) in GBTCL is essential to overcome this situation. This helps to identify where *revisions* are required in the budget to account changing conditions, errors, modification to company's plan etc. Monitoring of Budget Performance should be the responsibility of the managers in GBTCL. The essence of the effective monitoring of Budget Performance is that the managers should provide *accurate, relevant, actionable* information on time to the appropriate management level so that budget can give a realistic target to measure the performance.

It is also important to note that at the time of revising the budget, the primary budget as well as past information should not be ignored as they are the basis for preparing all budgets.

(B)

Alternative – 1 with No Strike : (Refer W.N. 2, 3)

Cost of Settlement is 15% Increase i.e. Rs. 216 per unit

$$\begin{aligned} \text{Annual Cost of Settlement} &= 54,000 \text{ units} \times \text{Rs. } 216 \\ &= \text{Rs. } 1,16,64,000 \end{aligned}$$

Alternative 2 i.e. if Strike Goes Ahead : (Refer W.N. – 1, 2, 3)

Extra Cost	(Rs.)
Annual Incremental Labour Cost (Ex. Strike Days Production) [$\{54,000 \text{ units} - (25 \text{ Days} \times 180 \text{ units per Day})\} \times \text{Rs. } 144.00$]	71,28,000
Loss of Contribution due to loss of sales [1,300 units \times Rs. 2,200]	28,60,000
Incremental Labour Cost for Balance 3,200 units [$(25 \text{ Days} \times 180 \text{ units per Day}) - 1,300 \text{ units}$] \times Rs. 144.00	4,60,800
Overtime Premium [3,200 units \times 1,584 \times 0.5]	25,34,400
Payment for Efficiency [3,200 units \times 1/9 \times 1,584 \times 1.5]	8,44,800
Additional Fixed Cost	1,00,000
	1,39,28,000

If there is no strike, it will yield a financial benefit of Rs. 22,64,000 (Rs. 1,39,28,000 – Rs. 1,16,64,000). Management should accept union's demand.

Working Note

(1) Statement Showing Contribution per unit of 'DBC'

	Rs.
Selling Price	6,000
Less : Variable Costs :	
Labour Cost	1,440
Production Ex. Wages (Rs. 3,600 – Rs. 1,440)	2,160
Distribution	200
Contribution	2,200

(2) Calculation of Labour Cost

Direct Labour (40% of production costs of Rs. 3,600) = Rs. 1,440 per unit

With 15% Increase, Revised Labour Cost (Rs. 1,440 + Rs. 216)= Rs. 1,656

With 10% Increase, Revised Labour Cost (Rs. 1,440 + Rs. 144)= Rs. 1,584

(3) Statement Showing Budgeted Production

Total Time in a Day : (8 hrs. × 60 minutes)	= 480 minutes
Less : Idle Time	= 48 minutes
Coffee Break	= 20 minutes
Instructions	= 22 minutes
Training	= 30 minutes
Productive Time per day	=360 minutes
Therefore, 'DBC' to be produced per man per day : (360 / 180 × 1)	= 2 units

Since 'DBC' are produced at the rate of 2 "DBC' per man day, so total yearly production will be 54,000 units (2 units× 90 men × 300 days) of 'DBC'

→ This problem has been solved by comparing '**Existing Situation**' with both 'Alternatives (**Strike or Non – Strike**)' independently. However, this problem can also be solved by comparing 'Alternatives (Strike or None – Strike)' only and final answer would be the same. Students may also solve this problem by taking 'Total Approach' instead of 'Incremental Approach'