

MOCK TEST PAPER

FINAL (NEW) COURSE: GROUP – II

PAPER – 5: STRATEGIC COST MANAGEMENT AND PERFORMANCE EVALUATION

SUGGESTED ANSWERS/HINTS

1. (i) Let's acknowledge this fact that CRF is a not-for-profit organisation and every not-for-profit organisation possess the following features:

- It performs non-economic activities
- Required funds to perform such activities
- Wealth creation for shareholders is not among the objectives
- Not expected/allowed to distribute the surplus among the stakeholders

Despite the fact that the not-for-profit organisation need not earn a profit, but it doesn't free them from their fiduciary responsibility towards the contributor of funds. They are responsible to provide reasonable assurance to the contributors of the fund that the fund is applied for the advancement of the stated purposes only and scale up to which such purposes are attained. So, performance measurement and evaluation is essential for Not-for-profit organisations as well, hence CRF should install the performance management system.

- (ii) Due to its not-for-profit nature, the CRF will face the following inherent challenges in the performance measurement:

- **It is difficult to quantify the cost and benefits** because the nature of the benefit can be behavioral and futuristic, whereas cost also includes externalities. There is also a time gap between the cost incurred and the benefit accrued, which makes trade-offs further difficult and complex. The best **way-out** is to use NFPI in addition to FPI, to consider the non-monetary even qualitative factors.
- **Performance and commitment of state** (government) have an impact. Since the health of nationals are crucial for the government of the state or union, hence it may possible country may have any government health program and same is working effectively; then the obvious scope of activities by CRF will be reduced or changed substantially. So the scope of performance depends upon the performance of the government in the health sector, hence not an independent factor. The best **way-out** is to have a flexible performance matrix which is adjustable depending upon the performance of the state.
- **Multiple objectives to be attained that too within a limited set of resources.** Due to diverse stakeholders, a not-for-profit organisation like CRF has multiple objectives, which causes conflict inter-se. The best available **way-out** is to prioritisation among these objectives. Mind it, prioritisation shall be based upon importance (utility) and urgency (time).
- **Measuring the utility of funds is essential but difficult.** Not-for-profit organisations don't earn to spend, they just budget to spend. The utility of funds for the not-for-profit organisation is not the same always if they have less fund to spend then utility may be more and vice versa due to the law of diminishing marginal returns. The **way-out** is the use of the value for money framework to measure the utility of funds spent.

(iii) Key Performance Indicator against each of the Critical Success Factors of CRF

Critical Success Factors	Key Performance Indicators
To reduce the number of people suffering from cancer.	<ul style="list-style-type: none"> <li>Number of people suffering from cancer in the country during a period</li> <li>Improvement in recovery rate</li> </ul>
To develop treatment facilities for cancer patients	<ul style="list-style-type: none"> <li>Number of new# treatments methods and medicines developed to cure cancer during a period*</li> <li>Reduction in mortality rate*</li> </ul>
To fund research programs to study the causes of cancer and prevention therefrom	<ul style="list-style-type: none"> <li>Percentage of money spent on research to the total amount of contributions in a period</li> <li>Number of research projects completed within time and budget during a period</li> </ul>
<p>* for each type of cancer  # only those which proceed beyond the clinical trial to mainstream medical practice  <b>Note</b>– Alternate KPIs, but those which are relevant to the facts of the case may also be provided.</p>	

(iv) Economy, efficiency, and effectiveness (3Es) are three dimensions of the value for money model which ensure the best possible value from available money (usually limited).

- **Effectiveness** (spend wisely) is an output measure, the goal approach to check whether the organisation has achieved its desired mission and objectives?
- **Efficiency** (spend well) is a link between input and output factor, a process approach to check whether the resources and funds available to the organisation have been utilised efficiently i.e., maximum output has been obtained with minimum input?
- **Economy** (spend less) is an input measure, the resource approach to check whether the appropriate quantity and quality of inputs are available at the lowest cost?

To form an **integrated conclusion** based on the non-aligned outcomes of 3Es, the board of trustee may consider the following stepwise guidelines:

**Step 1** – Whether the objective has achieved i.e., is the operations been effective?

**Step 2A** – If the answer to the question asked in step 1 is **yes**. Then ask, are the expenses within budget? Are the operations economical and efficient?

**Principle for the conclusion** – Answer to both the step 1 and 2A is yes, the board of trustee can conclude that value for money served.

**Note** - A cost-over run can also be justified, only if the operations have been effective; provided further that all the expenses incurred are indeed justified and that the resources have been put to the best possible use.

In a given case it is mentioned that CRF has a system of budgetary control and usually meets the budgeted target and hardly overrun the budget, hence above-mentioned note has less worth.

**Step 2B** – If the answer to the question asked in step 1 is **no**. Then ask, is the difference from the target is marginal or huge? If the target is missed marginally then apply the decision principle stated in Step 2A, but if the target missed with a huge difference; then review the strategy.

## 2. (i) Backflush accounting

Back-flush accounting **helps in implementing JIT** system. It reduces the number of accounting entries by **delaying** the recording of cost until event take place, in case of JIT even when goods are moved as finished inventory or sold; **hence save costs and time**.

### (ii) Throughput return per oven hour

(sales - direct material cost)/Usage of bottleneck resource

(₹30 – ₹15) / 0.30 hours i.e., ₹50 per oven hour

#### Operating cost per oven hour

(total operating cost/ bottleneck resource i.e., hrs. available

₹22,500/ 500 hrs. i.e., ₹45 per oven hour

#### Throughput accounting ratio

(Throughput return per hour/cost per hour)

₹50 per oven hour / ₹45 per oven hour i.e., **1.11 times**

#### Interpretation

Throughput accounting ratio is simply a relation between earning revenue and incurring cost in terms of battle-neck, usually per unit of bottleneck activity. Throughput accounting ratio of any product if greater than one, then signify profitable business and in case ratio is less than one it means organisation loses money every time such product is produced.

In case of cup-cake unit of bake studio, throughput accounting ratio is 1.11 times which signifies business of baking cup-cakes is profitable because return is ₹1.11 to every rupee of cost.

At this point it is worth to note, that throughput accounting and limiting factor analysis are different approaches, despite both moves around bottleneck. Throughput accounting is considered as approach to management reporting. Whereas limiting factor analysis is a financial analysis tool that support management, to enhance revenue/contribution.

### (iii) Maximum available time for each of process (in minutes)

Process	Total time*	Downtime#	Available Time
Beating	600	90	510
Preparing	600	150	450

\*10 Hours (morning 10 to evening 8) @ 60 minutes

# 1.5 hours & 2.5 hours @ 60 minutes

Maximum possible units of hot chocolate and latte can be served.

Process\Product	Hot Chocolate	Latte
Beating	510/9.5 Minutes = 53.68	510/7.5 Minutes = 68
Preparing	450/9 Minutes = 50	450/6.8 Minutes = 66.17

In case of both the products number of units are higher in case of beating process in comparison to preparing process. Hence, **time available for beating process is not binding constrain**, the limiting factor or constrain is preparing process. Hence, decision of maximising contribution shall be based upon time available for preparing process.

**Throughput approach** - Maximising the *contribution per minute* in preparing process.

Particulars	Hot Chocolate	Latte
Selling Price	100	80
Material Cost	40	30
Throughput Contribution	60	50
Time required in preparing process (In Minutes)	9 Minutes	6.8 Minutes
Contribution per minute of preparing process	6.66	7.35
Ranking	II	I
Serve	3 Cups (balancing figure)	62 Cups

**Daily Production Plan**

Product	Units	@	Time	@	Amount of Contribution (In ₹)
Hot Chocolate	3	9 minutes	27 (balance fig.)*	60 per unit	180
Latte	62 (maximum consumption)	6.8 minutes	421.6	50 per unit	3,100
Total			<b>448.6 (450)</b>		<b>3,280</b>

\*Balancing figure – after serving 62 cups of latte, 28.4 minutes left and @ 9 minute per cup only 3 cups of hot chocolate can be completely prepared. There will be idle time of 1.4 minute.

**Traditional approach** - Maximising the *contribution per minute* in preparing process

Particulars	Hot Chocolate	Latte
Selling Price	100	80
Total Variable Cost	70	60
Contribution	30	20
Time required in preparing process (In Minutes)	9 Minutes	6.8 Minutes
Contribution per minute of preparing process	3.33	2.94
Ranking	I	II
Serve	50 Cups	Nil

**Daily Production Plan (under traditional system)**

Product	Units	@	Time	@	Amount of Contribution (In ₹)
Hot Chocolate	50 (maximum consumption)	9 minutes	450	30 per unit	1,500
Latte	Nil	6.8 minutes	Nil	20 per unit	Nil
Total			<b>450</b>		<b>1,500</b>

## Discussion

Marginal Costing gained importance in first half of 20<sup>th</sup> century, especially in 1930's and 40's, then labour cost used to be variable largely of completely, because there were casual workers. But circumstance and labour laws has been changed significantly since then, now the labour/workforce is largely permanent, not if the regular in nature, hence **labour cost no longer remain variable cost**. Especially in shorter period let's say decision making for 3-6 months. Labour contracts used to have termination clause, which usually have provision of notice etc. Throughput approach gives importance to this substance and consider only material cost as real variable cost. Hence, rather considering the contribution after deduction of all variable cost, it computes throughput contribution by reducing material cost from revenue. Hence, use of throughput costing can make decision more relevant because it considers the true nature of cost. **Therefore, Critical aspects, which management accountant need to focus are–**

- **Is decision really short term or not? and**
- **True nature of variable overhead.**

At this Point, it is important to note that the marginal costing approach requires only variable costs to be used to calculate contribution. If only material costs are variable, then only those costs should be used in the calculation of contribution. So, there should be **no difference the two systems** in this respect.

**Overall, decision of maximisation of contribution can be taken using either of traditional or throughput contribution. However, appropriateness of selection among these two techniques depends on the variability of labour and variable overheads, which in turn depends on the time horizon of the decision.**

3.

## Report

To: The Directors of TPE

From: Management Accountant

Subject: Warehouse Performance

Date: 05<sup>th</sup> April 2021

- (i) NY has achieved the best performance with (12) points. SG and HK have given a reasonable level of performance with (8) points each. NZ is under performed earning only (4) out of the twelve points.

NY is the only warehouse which has achieved both increased revenue and increased profit over targets.

In the courier delivery services and customer care, NY has achieved all (6) of the target standards, SG (4); HK (3). The data of NZ indicates the need for investigation due to achievement of only (1) out of six targets.

In respect of the credit control and administrative efficiency, HK and NY have achieved all (4) standards and SG has achieved (3) of the four standards. Once again, NZ is the 'bad performer' and achieved only (2) of the four standards.

**(Refer points table)**

- (ii) The terms mentioned in the question might be seen as representative of the dimensions of performance. The analysis of dimensions may be translated into results and determinants.

**Results** are the outcome of decisions and actions taken by management in the past. Measurement of the results may be done by focusing on financial performance and competitiveness. *Financial performance* may be measured in terms of revenue and profit as shown in the points table. The point's system shows which warehouses have achieved or exceeded the target. Besides, liquidity is another criterion for the measurement of financial performance. The total points in table showed that HK and NY warehouses appear to be the best performer in aspects of credit control. *Competitiveness* may be assessed in terms of sales growth or in terms of market share or increase in customers etc.

**The determinants** are the factors which may be seen to contribute to the achievement of the results. In other words, Determinants refer to the forward-looking dimensions of Fitzgerald and Moon model, for example- what areas of future performance are most important for TPE to achieve positive financial and competitive results? Quality, resource utilization, flexibility and innovation are the determinants of future success and they are also the contributors to the achievement of competitiveness and financial performance.

In TPE a main *quality* issue seems to be courier delivery services and customer care. Points table shows that the NZ warehouse has a major problem in this area and achieved only (1) point out of the six available.

*Resource utilisation* for TPE is critical to its financial success and may be measured by effective and efficient use of drivers, vehicles, and financial resources. To some extent, such measurement can be seen in the data relating to courier delivery services and customer care. For example, the reason of late collection of couriers from customers may be a shortage of vehicles and/or drivers. Such shortages might be due to sickness, staff shortage, problems of vehicle availability, vehicle maintenance etc.

*Flexibility* may be an issue like varied range of service as to meet different segment of customer is unavailable. Possibly, a short-term sub-contracting of vehicles or collections or deliveries may help in overcoming late collection problems.

The points table i.e. 'target vs actual' may be considered as an example of *innovation* by TPE. This gives a comprehensive set of measures providing an incentive for improvement at all warehouses. The points table may demonstrate the extent of achievement or non-achievement of TPE strategies for success. For instance – the firm may have a customer care commitment policy which identifies factors that should be achieved on a continual basis. For example, timely collection of couriers, misdirected couriers re-delivered at no extra charge, prompt responses to customer claims and compensation for customers.

- (iii) The performance measurement system used by TPE is simple to use. However, it may be looked upon measuring the right things since the specific measures used in points table encompass a range of dimensions designed to focus the organization on factors essential for TPE's success and not restricted to traditional financial measures.

At TPE, internal benchmarking has been used to provide sets of absolute standards that all warehouses are expected to achieve. This will help to ensure a continuous focus upon the adoption of 'best practice' at all warehouses. Benchmarks on delivery performance give importance to quality of service whereas benchmarks on profitability i.e. target profits focus solely upon profitability.

Incentive schemes have been used at TPE, linking the achievement of firm targets with rewards. It might happen that the profit incentive would act as a booster to each warehouse management team. However, what is required for the prosperity of TPE is a focus of management on the determinants of success rather than the results of success.

## Workings

**Warehouse – Points Table**  
for the year ended .....

	SG	HK	NY	NZ
<b>Revenue and Profit</b>				
Revenue	0	1	1	1
Profit (see note below)	1	0	1	0
Total Points earned ... (A)	1	1	2	1
Ranking	II	II	I	II
<b>Courier Delivery Services and Customer Care</b>				
Late collection of couriers	1	0	1	0
Misdirected couriers	0	1	1	0
Delayed response to complaints	1	1	1	0
Vehicle breakdown delays	0	0	1	0
Lost items	1	1	1	0
Damaged items	1	0	1	1
Total Points earned ... (B)	4	3	6	1
Ranking	II	III	I	IV
<b>Credit Control and Administrative Efficiency</b>				
Average Debtor weeks	0	1	1	0
Debtors more than 60 days	1	1	1	1
Invoice queries (% of total)	1	1	1	1
Credit notes (% of revenue)	1	1	1	0
Total Points earned ... (C)	3	4	4	2
Ranking	II	I	I	III
Total Points ... (A)+(B)+(C)	8	8	12	4

(a) Profit Points Calculation

Actual Results e.g. SG =  $3.45/22.50 = 15.3\%$  (1 point); HK =  $3.60/27.00 = 13.3\%$  (0 point)

(b) Debtors more than 60 days (% of total)

Particulars	SG	HK	NY	NZ
Revenue ('000)	22,500	27,000	21,000	33,000
Debtor weeks	5.80	4.90	5.10	6.20
∴ Debtors ... (A)	2,510	2,544	2,060	3,935
Less than 30 days ... (B)	(1,950)	(2,250)	(1,770)	(3,000)
31–60 Days ... (C)	(481.50)	(199.50)	(229.50)	(828.00)
More than 60 days ... (A) - (B) - (C)	78.50	94.50	60.50	107.00
Debtors in more than 60 days (% of total)	3.13	3.71	2.94	2.72

(c) Value of credit notes raised as a % of revenue e.g. SG =  $₹67,500/₹2,25,00,000 = 0.30\%$

4. (a) "For successful operation of JIT inventory system, the suppliers chosen must be willing to make frequent deliveries in small lots. Rather than deliver a week's or a month's material at one time, suppliers must be willing to make deliveries several times a day and in the exact quantities specified by the buyer."

It is described in the problem that suppliers are not willing to

- make frequent deliveries and
- make supplies in the exact quantities as required.

Accordingly Mr. W's doubt is correct on successful implementation of JIT System.

(b) TEV=

Particulars	₹
Operating Cost	- ₹6,250 2,500 hrs. × (₹5.00 - ₹7.50)
System Crash Savings	₹9,500 ₹1,00,000 × (10.00% - 0.50%)
Price of Next Best Alternative	₹37,500
TEV	₹40,750

OR

Situation	Appropriate Pricing Policy
(i) 'A' is a new product for the company and the market and meant for large scale production and long-term survival in the market. Demand is expected to be elastic.	Penetration Pricing
(ii) 'B' is a new product for the company, but not for the market. B's success is crucial for the company's survival in the long term.	Market Price or Price Just Below Market Price
(iii) 'C' is a new product to the company and the market. It has an inelastic market. There needs to be an assured profit to cover high initial costs and the unusual sources of capital have uncertainties blocking them.	Skimming Pricing
(iv) 'D' is a perishable item, with more than 80% of its shelf life over.	Any Cash Realizable Value*
(v) 'E' is modern patented drug entering the market.	Skimming Pricing

(c) M-DCB has three possible courses of action, including status quo (keeping the features as it is) and making changes as per suggestions of GM-CASA Operations or GM-Customer Relation.

Considering the calculation of annual income shown in annexures (I, II, and III) based upon below mentioned assumptions, it is advisable to the Board of Directors to change the features of account for the business customer and adopt the suggestion of GM - CASA operations, because it results in maximum annual income to M-DCB.

**Assumptions** – While making the calculation it is assumed that:

- Interest @ 14% p.a. will continue to be charged on an overdrawn account with debit balances.
- Change in business customer base corresponding to change in features of the account, will not result in any change in staffing, administration cost, or resource planning.
- Transactions take place throughout the year without the time value of money.
- Customer those who close or open the account, do same on day 1 of the year (at the opening of the year)



**Annexure I - Statement of annual income - status quo** (keeping the feature as it is)

Head	Details	Amount (₹'In Lakhs)
Transaction Charges	(18 lakh business customers – 2.70 lakh lost business customers) × (140 transactions × 12 months) × ₹2 per transactions	51,408.00
Interest Income	50% of (18 lakh business customers – 2.70 lakh lost business customers) × ₹45,000 per customer × 14%	48,195.00
Interest Expenses	50% of (18 lakh business customers – 2.70 lakh lost business customers) × ₹1,20,000 per customer × 2%	(18,360.00)
<b>Annual income</b>		<b>81,243.00</b>

**Annexure II - Statement of annual income - suggestions of GM-CASA Operations**

Head	Details	Amount (₹'In Lakhs)
Transaction Charges	(18 lakh business customers + 1.8 lakh new business customers) × ₹3,000 per customer	59,400.00
Interest Income	50% of (18 lakh business customers + 1.8 lakh new business customers) × ₹45,000 per customer × 14%	62,370.00
Interest Expenses	50% of (18 lakh business customers + 1.8 lakh new business customers) × ₹1,20,000 per customer × 3%	(35,640.00)
<b>Annual income</b>		<b>86,130.00</b>

**Annexure III - Statement of annual income – suggestions of GM-Customer Relation**

Head	Details	Amount (₹'In Lakhs)
Transaction Charges	(18 lakh business customers + 3.6 lakh new business customers) × ₹0 per customer	Nil
Interest Income	50% of (18 lakh business customers + 3.6 lakh new business customers) × ₹45,000 per customer × 14%	68,040.00
Interest Expenses	50% of (18 lakh business customers + 3.6 lakh new business customers) × ₹1,20,000 per customer × 0%	(Nil)
<b>Annual income</b>		<b>68,040.00</b>

5. (a) (i) TPM (Total Productive Maintenance) is the system which, adds value by maintaining and improving the production process and ensuring safety, quality, continuity through man and machines. Productivity is all about the efficient and effective use of all resources. In order **to evaluate the TPM performance** in terms of effective use of PA-C12 at LPS, OEE (Overall Equipment Effectiveness) can be applied. OEE is a “best practices” metric that identifies the percentage of available production time that is productive in the true sense (with quality). OEE measured in terms of percentage. A score of 100% represents “**perfect production**” with zero waste, zero defect, and zero downtime.

OEE can be computed either as–

$(\text{Good Count} \times \text{Ideal Cycle Time}) / \text{Planned Production Time}$

Or

$(\text{Availability}) \times (\text{Performance}) \times (\text{Quality})$

**Availability** measures the run time as a percentage of planned production time. Run time may be less than planned production time due to unplanned downtime. Unplanned downtime arises on account of loss of production time due to abnormal downtime (like breakdown or power failure etc.)

**Performance** measures the speed of work. It measures the relation between ideal cycle time required for actual production and run time (time consumed for actual production).

**Quality** can be defined as conformance to the need of customers. The product which meets the quality criteria (such customer's need) can be said, good count. Quality can be measured as the percentage of good counts to the total counts (product produced or output generated).

Seiichi Nakajima in his book, Introduction to TPM (originally published in 1984 and later in 1988 translated into English) suggested that ideal values (World-Class OEE) for the OEE component measures are:

- Availability rate in excess of 90 percent
- Performance efficiency rate in excess of 95 percent
- Quality rate in excess of 99 percent

Such levels of Availability, Performance and Quality would result an **ideal OEE scores of approximately 85 percent**.

## (ii) Analysis

TPM performance is positive in term of effective use of PA-C12 at LPS because Overall Equipment Effectiveness (OEE) is improved from **84.79% to 86.61%**. There is an absolute increase of 1.82%, the relative increment is 2.15% (1.82% to 84.79%). Now OEE is beyond the ideal rate of 85% suggested by Seiichi Nakajima. Hence, considering OEE only (rather its individual components) it can be said that machine demonstrate the world class performance. It is important to note that both performance and quality rate are still lower than the ideal rate (world class performance), whereas availability rate still persists beyond the ideal rate and upholding the OEE beyond ideal rate of 85%.

## WORKINGS

### OEE before TPM

$$\text{OEE} = \text{Availability} \times \text{Performance} \times \text{Quality}$$

**OEE Factors are calculated as follows–**

1. Availability:  $\text{NOT} / \text{NAT} = (6,480 / 6,840) \times 100 = 94.74 \%$
2. Performance:  $\text{IOT} / \text{NOT} = (6,120 / 6,480) \times 100 = 94.44\%$
3. Quality:  $(\text{IOT} - \text{LOT}) / \text{IOT} = (6,120 - 320) / 6,120 \times 100 = 94.77\%$

Or

$$\left\{ \frac{306 \text{ units} - 16 \text{ units}}{306 \text{ units}} \right\} \times 100$$

$$OEE = A \times P \times Q = 94.74\% \times 94.44\% \times 94.77\% = \mathbf{84.79\%}$$

#### **Alternative Presentation-I**

Good Counts = 290 units

Planned Production Time= 6,480 mins. (or NAT)

$$OEE = (\text{Good Counts} \times \text{Ideal Cycle Time}) / \text{Planned Production Time} \\ \{(290 \times 20 \text{ mins.}) / 6,840\} \times 100 = \mathbf{84.79\%}$$

#### **Alternative Presentation-II**

OEE = (Ideal operating time – loss operating time) / Net Available Time

$$\{(6,120 - 320) / 6,840\} \times 100 = \mathbf{84.79\%}$$

#### **Workings**

1. Scheduled Time (total time) = 8,640 Minutes (6 days × 3 shifts × 8 hrs. × 60 mins.)
2. Planned Down Time = 1,800 minutes (100 minutes\* × 6 days × 3 shifts)  
[2 tea breaks × 15 minutes + 1 lunch break 30 minutes + shift change 30 minutes + preventive maintenance 10 minutes = 100 minutes]
3. Net Available Time (NAT) = 8,640 – 1,800 = 6,840 minutes
4. Unplanned Downtime = 360 minutes\*  
[\*breakdown maintenance (60 minutes × 5 hrs.) + power failure (60 minutes × 1 hr.)]
5. Net Operating Time (NOT) = Net Available Time – Unplanned Downtime  
NOT = 6,840 – 360 = 6,480 minutes
6. Ideal Operating Time (IOT): 306 total units × 20 mins. = 306 × 20 = 6,120 minutes
7. Lost Operating Time (LOT): 16 units × 20 mins. = 16 × 20 = 320 minutes

#### **OEE after TPM**

$$\mathbf{OEE = Availability \times Performance \times Quality}$$

**OEE Factors are calculated as follows–**

1. Availability: NOT / NAT = (6,900 / 7,020) × 100 = 98.29 %
2. Performance: IOT / NOT = (6,400 / 6,900) × 100 = 92.75%
3. Quality: (IOT – LOT) / IOT = (6,400 – 320) / 6,400 × 100 = 95.00%

Or

$$\left\{ \frac{320 \text{ units} - 16 \text{ units}}{320 \text{ units}} \right\} \times 100$$

$$OEE = A \times P \times Q = 98.29\% \times 92.75\% \times 95.00\% = \mathbf{86.61\%}$$

#### **Alternative Presentation-I**

Good Counts = 304 units

Planned Production Time= 7,020 mins. (or NAT)

$$OEE = (\text{Good Counts} \times \text{Ideal Cycle Time}) / \text{Planned Production Time} \\ \{(304 \times 20 \text{ mins.}) / 7,020\} \times 100 = \mathbf{86.61\%}$$

### Alternative Presentation-II

OEE = (Ideal operating time – loss operating time) / Net Available Time

$$\{(6,400 - 320) / 7,020\} \times 100 = 86.61\%$$

### Workings

1. Scheduled Time (total time) = 8,640 Minutes (6 days × 3 shifts × 8 hrs. × 60 mins.)
2. Planned Down Time = 1,620 minutes (90 minutes\* × 6 days × 3 shifts)  
[2 tea breaks × 10 minutes + 1 lunch break 35 minutes + shift change 20 minutes + preventive maintenance 15 minutes = 90 minutes]
3. Net Available Time (NAT) = 8,640 – 1,620 = 7,020 minutes
4. Unplanned Downtime = 120 minutes\*  
[\*breakdown maintenance (60 minutes × 1 hrs.) + power failure (60 minutes × 1 hr.)]
5. Net Operating Time (NOT) = Net Available Time – Unplanned Downtime  
NOT = 7,020 – 120 = 6,900 minutes
6. Ideal Operating Time (IOT): 320 total units × 20 mins. = 320 × 20 = 6,400 minutes
7. Lost Operating Time (LOT): 16 units × 20 mins. = 16 × 20 = 320 minutes

- (b) The performance pyramid covers not just only financial performance but also a broad range of underlying processes of business organization which *drive financial performance*. It facilitates to set financial and non-financial performance measures. Non-financial measures are important indicators which can help to attain *long-term* financial performance. The elements of the pyramid are interconnected, and each level in the pyramid backs the one above it. For example, on-time delivery of pizzas will increase customer satisfaction, which will eventually lead to greater market share, one element of the vision.

The left side of the performance pyramid covers external effectiveness, such as *customer satisfaction*, while the right side of the pyramid covers internal efficiency, such as *flexibility* and *productivity*. Operational performance is signified by the four elements, which are quality, delivery, cycle time and waste, at the bottom level of the performance pyramid. Operational performance measure can help the organization to achieve the vision of the organization. Reduction in pizza delivery time and delivery of fresh hot delicious pizza i.e., quality can help Pizza House to achieve its vision.

**Cycle time** can be reduced by using live tracking system. Live tracking system is a key to improve *productivity* and *profitability*. It can help in taking well-versed decisions and *schedule pizza delivery more efficiently*.

GPS driver tracker will allow real time monitoring of vehicles and offer detailed insights of fuel usage, driver's behavior, engine's idle time, etc. using this data efficiently; money saving areas for pizza delivery can be identified. Through this tracking system idle delivery vehicles can also be identified. This may lead to an increase in the *number of deliveries per day* and more deliveries, translated into more business.

It can also assist Pizza House to reduce the fuel consumption and unnecessary overtime costs. Reducing fuel consumption would lead to an improvement in financial performance. Measuring average fuel consumption per km travelled does not, however, relate directly to activity, for example, to the number of pizzas delivered. Average fuel consumption will vary between type of vehicle used for delivery i.e., scooters or motorcycles and conditions of roads in the areas of delivery. Average fuel consumption per km is not a good measure of waste or any other aspect of operational performance of business organization. To be useful in managing operational performance, this measure should be changed to average fuel consumed per pizza delivered which would be an appropriate measure for **waste**.

A loyal and satisfied client is paramount to success of a food delivery business. With the assistance of tracking system, pizza delivery vehicles will respond to service calls quickly and reach their destination on time. Customers are likely to value on-time pizza delivery very much, this will be one of the main causes, and they will choose pizza from Pizza House. The proportion of on-time **delivery** is a measure of operational performance i.e., key driver for *customer satisfaction*.

Moreover, use of pizza delivery bags to keep the pizza hot and fresh will improve the taste, aroma and flavor of pizzas, which is also related to the **quality** element of the performance pyramid and is key driver of *customer satisfaction*.

## 6. (a) Workings

### Statement Showing Benefit from Prospective Export Contract

	₹
Direct Material	1,500
Direct Labor (2 hrs. × ₹40)	80
Leakage Testing	50
Variable Overheads (including packing)	214
Export Clearance Charges on FOB term	36
Total Relevant Cost	1,880
USD to ₹	₹67
Relevant Cost	\$28.06
Price Offered by Customer	\$28.50
Benefit <i>per extinguisher</i>	\$0.44
No. of Extinguishers	20,000
Total Benefit	\$8,800

### Advise

From financial perspective, it will be profitable for N2 to accept the contract because of gain of \$8,800 (₹5,89,600) along with export incentives of drawback. Besides this, following consideration should also be taken into consideration while exporting fire extinguishers:

### Statutory Compliances

Before exporting to a foreign country or even agreeing to sell to a new customer in a foreign country, N2 should be aware of foreign laws that might affect the sale. Export documentation is important as it plays a significant role in regulating the flow and movement of goods in international markets. Each country has its own prescribed statutory documents to be complied by exporters and importers. Thus, N2 should consider about the documentation and inspection compliances part of new buyer. It may include third party audit, commercial invoice and packaging list requirements, certificate requirements like- no child labour certificate, inspection certificate, reach compliance certificate etc. If any compliance requirement is not met, what will be the consequences? There may be stiff penalty has to be paid owing to non-compliance or failure to accurately comply with the export obligation.

### Buyer Creditworthiness

It is necessary that before shipment the exporter to carry out its own credit check on the importer to determine creditworthiness. Thus, N2 should make a proper assessment of the creditworthiness of the foreign buyer and spend sufficient time in cross checking the credit

worthiness of his counterpart to avoid any kind of unforeseen situation in future. Such information can be easily availed through contracts or through ECGC. Private agencies also provide information on paid service basis. However, this risk can be covered by asking for LC payment terms or 100% advance or opting for post shipment insurance for goods being exported.

### **Industry Analysis**

Industry analysis involves such things as assessing the competition in the industry; the interplay of supply and demand in the industry; how the industry holds up against other industries that are emerging and providing competitions; the likely future of the industry, especially in light of technological developments; how credit works in the industry; and the exact extent of the impact that external factors have on the industry.

For N2, it is worthwhile to know the current and future demand of fire extinguisher and factors influencing the growth of global fire extinguisher market. N2 can perform industry analysis through three main ways i.e. the Competitive Forces Model (also known as Porter's 5 Forces); the broad factors analysis, also known as PEST analysis; and SWOT Analysis. It may also arrange industry report from trusted sources.

### **Additional Terms**

Ensure that all terms are clear and suit the business purpose. For instance, delivery terms should provide date of shipment or means of determining the date. In some circumstances, a late delivery penalty may be incurred where goods are not supplied by a specific delivery date. Therefore, N2 should evaluate whether shipment date is attainable or not. If the target shipment date could not be met, what will be the charges? Further, N2 must also check whether the foreign bank charges are subject to beneficiary account. If yes, then the same must be considered in the quotation.

**Overall**, N2 should accept the proposed contract only after due and careful consideration of above factors.



Conceptually correct brief explanation is sufficient for each point.

- (b) The following table shows Marcus's budget profit and actual profit for the month of September 2020:

Particulars	Budgeted Profit	Actual Profit
Items packed	93,750	1,12,500
Revenue (₹)	4,21,875	5,06,250
Less: Variable Costs	1,40,625	1,80,000
Contribution Margin (₹)	2,81,250	3,26,250
Less: Fixed Costs	58,000	70,000
<b>Profit (₹)</b>	<b>2,23,250</b>	<b>2,56,250</b>

### **Analysis**

Marcus's standard selling (packing) price is ₹4.50 per item and his standard variable cost is ₹1.50 per item. Therefore, Marcus's budgeted revenue =  $93,750 \times ₹4.50 = ₹4,21,875$  and his budgeted variable costs =  $93,750 \times ₹1.50 = ₹1,40,625$ . From the table, we can identify that Marcus's actual profit for September 2020 was ₹33,000 higher than his budgeted profit ( $₹2,56,250 - ₹2,23,250$ ) i.e., Marcus's total profit variance is ₹33,000 (F).

Marcus's **sales contribution volume variance** equals to the difference between his standard contribution and budgeted contribution. Each item is budgeted to contribute ₹3.00 toward profit; since Marcus packed 18,750 more items than budgeted, the increase in volume should have contributed ₹56,250 =  $18,750 \times ₹3.00$  to actual profit. Therefore, Marcus's sales contribution volume variance is ₹56,250 (F).

Marcus's overall **variable cost variance** equals to the difference between his standard variable costs and his actual variable costs, or ₹1,68,750 – ₹1,80,000 = ₹11,250 (A). But there is not adequate data to segregate Marcus's variable cost variance into price and quantity elements. To compute these variances, we would require the amount of resources Marcus budgets to use per item packed and the actual & budgeted price of each resource (i.e., an adverse variable cost variance can arise as Marcus used more resources per item packed and/or he paid more than budgeted for the resources used). While the issue appears to suggest that Marcus's adverse variable cost variance arose due to spending more on tape than planned, it is not sure that the entire ₹11,250 variance is attributable to this. In fact, it is likely that the tape price variance was greater than ₹11,250 (A) and that Marcus had a favorable resource quantity variance to offset this.

Marcus's **fixed cost expenditure variance** equals the difference between budgeted and actual fixed costs, or ₹58,000 – ₹70,000 = ₹12,000 (A).

We can now prepare the following budget reconciliation report:

Item	Amount (₹)
Budgeted Profit	2,23,250
Sales Volume Variance	56,250 (F)
Variable Cost Variance	11,250 (A)
Fixed Cost Expenditure Variance	12,000 (A)
Actual Profit	2,56,250