PAPER – 5: STRATEGIC COST MANAGEMENT AND PERFORMANCE EVALUATION

×××CASE STUDY/ CASE SCENARIO ×××

Ethical and Non- Financial Considerations

Food & Beverage

1. **Nutty Bites** produces many edible snacks that are very popular especially among children. Peanuts, Peanut oil are essential ingredients in many of its products. They are currently facing this ethical issue –

   "Medical studies have indicated peanut allergic reactions are on the rise. The prevalence is more profound among children. Reactions can range from hives around the mouth to potentially life threatening reactions when exposed even to the slightest trace of peanuts. There is growing media campaign to force companies like Nutty Bites to make disclosure about the presence of peanut on its package labelling"

   Nutty Bites is a mid-size company that has a growing market. Risk to peanut exposure can come not just from the presence of peanuts in its products. Some of its bought-in ingredients (raw material input) are cooked in peanut oil. There are risks of "cross-contamination" amongst products. Let us say, an equipment has been used produce cookies that has peanuts. Next, the equipment is used, without being cleaned, to produce chips that does not have peanuts as an ingredient. Some portion of the peanuts / peanut oil could contaminate that specific batch of chips produced. Since labels of chips would not mention "peanuts" as an ingredient, it poses a potential risk of causing allergic reaction to a customer unaware of this contamination.

   Management of Nutty Bites has called for a meeting to discuss this issue. *"The issue need not be addressed at all. After-all Nutty Bites is doing nothing against the law"* is the opinion of many members on the board of the company.

   Required

   (i) EXPLAIN why Nutty Bites should attempt to address this issue.

   (ii) STATE potential benefits that business can garner by addressing this issue.

   (iii) RECOMMEND, with reasons, the avenues available to Nutty Bites to address this ethical issue.

   (iv) EVALUATE the recommended solutions.

Product Life Cycle

2. **Cellwell Technologies Ltd.** is a manufacturer of mobile phones. It has been an established player in the market having launched various cell phone models in the last 10 years. With the preference for usage of cell phones increasing, the company has grown rapidly since inception. During the last two years, sales have been increasing but at a slower rate. Competition has increased and hence sales growth has been slowing down.

Cellwell Technologies plans to introduce a new smart phone model called XXX21. The company's research and development team has come up an additional feature for this cell phone model. This feature will periodically inform the customer using the cell phone regarding any software update required for the model. By installing these updates many existing bugs in the software model and security issues to the software can be fixed. This process can be executed remotely with the help of the new technology that the research and development team has developed. This improves the cell phone performance and keeps it running smoothly. It improves compatibility of the software with that used in other applications and devices. It also enhances customer experience as the software update will bring out new software features (like newest emotions / updated dictionary) that can be used by the customer. Consequently, the general utility of the cell phone life will improve by almost a year. There will be less complaints due to performance / compatibility related issues.

The business development team has come up with a proposal for sales promotion. As per this proposal, customers can trade in older model of their cell phone in order to buy the latest XXX21 model. Due to the trade, customers can buy the latest model XXX21 at a substantial discount.

After discussion with the research and development team, they conclude that this would have an additional advantage. Cellwell Technologies can ***refurbish*** (repair and renovate) these older models and resell them in the market at a substantially lower price. Typically, students or customers in the lower income groups who look for cheaper models may find this offer interesting. This creates a new market space for the company to target.

Those older cell phones traded in, that cannot be refurbished or are beyond repair / use can be ***recycled***. Various parts of these phones can be recycled and fitted into the new cell phone models that are being made. Any cell phone model contains various precious metals like gold, copper, platinum as also rare earth elements like neodymium, terbium to name a few. These are difficult to obtain and need to be mined out of the earth causing huge damage to the environment. With the demand for cell phone slated to increase, the need for these materials is going to increase as well. Therefore, if these materials can be extracted from old cell phones that would otherwise have been disposed-off into a landfill, it would benefit the environment while providing an alternate source of material procurement. Since billions of cell phones are used globally, every small measure makes an impact. With increasing awareness about environment hazards, such a proposal is likely to find support among customers. It is also helpful to improve the company's brand image.

Both proposals to introduce software upgrade feature in the cell phone as well as the trade in sales promotional offer are unique as no other competitor has such features in their products or have made such offers yet.

Required

(i) IDENTIFY the lifecycle phase of Cellwell Technologies Ltd. JUSTIFY your response with reference to the case facts.

(ii) DISCUSS the impact of the decision to allow trade in of the company's older cell phone models on the product lifecycle of such phone models.

×××QUESTIONS×××

Standard Costing

3. **Williams Footwear (WF)** is a shop that focuses on shoes for various sports and activities like jogging, cricket, tennis, and hockey. Budgeted profit for the WF is calculated considering an average selling price of ₹500 per pair of shoes and an average cost of ₹350 per pair of shoes. The supervisor of the WF has discretion in staffing and in setting prices. Usually, the WF is staffed for 650 hrs. per month at a budgeted rate of ₹125 per hr. In addition to this base wages, sales staff gets a payment equal to 5.5% of takings. Moreover, staffing levels are not expected to change in response to "little" changes in shoe sales. For Sep'2021, the WF had budgeted sales of 2,250 pairs of shoes and 650 staffing hrs. Actual results for Sep'2021 were as follows:

Pairs of shoes sold	2,500
Revenue	12,00,000
Less: Cost of shoes	8,25,000
Less: Staff – additional payment	66,000
Less: Staff – base wages @ ₹125 per hour	78,125
Profit	₹2,30,875

Note- "little" changes in shoe sales specified as ± 12%.

Required

(i) PREPARE a reconciliation statement of budgeted profit to actual profit.

(ii) COMMENT on supervisor's performance.

Relevant Costing

4. **Felicity Ltd.** is a chemical manufacturing company. It has received a special project that needs to be completed executed 3 months from the time it is accepted. The management has to communicate its acceptance or rejection of the project within few days. They have approached you, the management accountant to work out the costing for this project. Following is the information available:

1. Financing:

   The company would require a short-term overdraft of ₹5,00,000 immediately in order to execute the project. Bank charges an interest of 10% per annum on this overdraft. This overdraft facility would be needed for the duration of the project, that is 3 months and would be repaid in full at the end of the period.

2. Materials:

   Felicity Ltd. has a stock of inventory of 5,000 kg on hand that is not of immediate use. It can be sold as scrap in the market at ₹250 per kg. The special project requires 3,000 kg of this inventory which can be replaced at the current market price of ₹300 per kg.

3. Labour:

   (a) All skilled workers currently work full time in their respective departments, there are no idle hours. For this special project, 5 workers would be needed from other departments. They would totally devote 2,000 hours of labour time to this project. The cost of labour per hour is ₹300. Since their working hours have been diverted to this project, the production in the other departments cannot be met. Hence, the company would incur a loss of contribution of ₹1,00,000 for these 2,000 hours. Alternatively, the company can outsource the labour for this special project at a total cost of ₹625,000. The management will opt for the more cost-effective option as the quality of both in-house manufacturing and outsourcing is the same.

   (b) Overtime payment to inspection supervisor, who checks the final products would be ₹25,000. This would be incurred irrespective of whether the labour is in-house or outsourced.

4. Machine X-2.1"

   This project would require the use of an existing machine X-2.1". Depreciation of X-2.1" is ₹40,000 per annum. The variable operating cost of X-2.1" for the three-month period would be ₹3,00,000. At present, X-2.1" is operating at full capacity. By diverting it exclusively for the special project would cost the company a loss of contribution of ₹1,00,000 for the three-month period.

5. Administration overheads include apportionment cost of ₹25,000 and an incremental cost (incurred specifically due to the acceptance of the project) of ₹10,000.

6. Total revenue that the company can earn from the project is ₹20,00,000.

Required

COMMENT whether the special project should be accepted or not. Also give a complete ANALYSIS of the special project cost based on the principles of relevant costing.

Special Order Decision

5. **Fire Safety (FS)** is the manufacturer and supplier of firefighting and safety equipment for industrial use and follows the international quality standards and uses the high grade raw material. It is a fast-growing brand that protects millions of people across India, every single day. FS has been offered a bid on a prospective export contract for 30,000 commercial fire extinguishers with following specification from Australian buyer and the delivery terms is FOB.

"two-gallon cylinder holding 10 pounds of multi-purpose dry chemical at 380 PSI"

FS is exporting first time. The price computation per fire extinguisher is as follows:

	₹	₹
Direct Material		
Circle Part Cost	930	
Necking Part	45	
Bottom Part	75	
Fire Extinguisher Powder	885	
Heat Process	75	
Nozzle	90	
Meter	30	
Pipe	75	
Nitrogen	45	2,250
Direct Labor (2 hrs. × ₹60)		120
Leakage Testing		75
Variable Overheads (including packing)		321
Export Clearance Charges on FOB term		54
Fixed Overhead		150
Total		2,970
Add: Markup @ 20%		594
Price		₹3,564
AUD to INR		54.5
Price in AUD		**65.39**

After quotation of AUD 65.39, the buyer is negotiating the price and ready to pay only AUD 52.50.

Required

ADVISE whether it is worth accepting at AUD 52.50 considering other factors.

Life Cycle Costing

6. **Asian Mould Components (AMD)** was established in 2001 and has enormous wealth of experience in the mould manufacturing industry and serves wide range of plastic moulds all over nation. Over the past decade, AMD has developed the reputation for quality products & services for customer focused approach. It deals in injection moulds, blow moulds, die sets, moulds base etc.

With a state-of-the-art infrastructure facility, AMD is able to meet the qualitative and quantitative demands of its clients. Its vision & mission is to provide high class manufactured products by using best quality raw materials.

AMD has developed a new product "M-9" which is about to be launched into the market and anticipates to sell 1,20,000 of these units at a sales price of ₹200 over the product's life cycle of four years. Data pertaining to product "M-9" are as follows:

Costs of Design and Development of Molds, Dies, and Other Tools	₹12,37,500
Manufacturing Costs	₹83 per unit
Selling Costs	₹80,000 per year + ₹32 per unit
Administration Costs	₹1,23,000 per year
Warranty Expenses	4 Replacement Parts per 20 units at ₹8 per part; 2 Visit per 750 units (Cost ₹350 per visit)

Required

(i) COMPUTE the product "M-9"'s 'Life Cycle Cost'.

(ii) SUGGEST two ways to maximize "M-9''s lifecycle return.

Note: Ignore time value of money

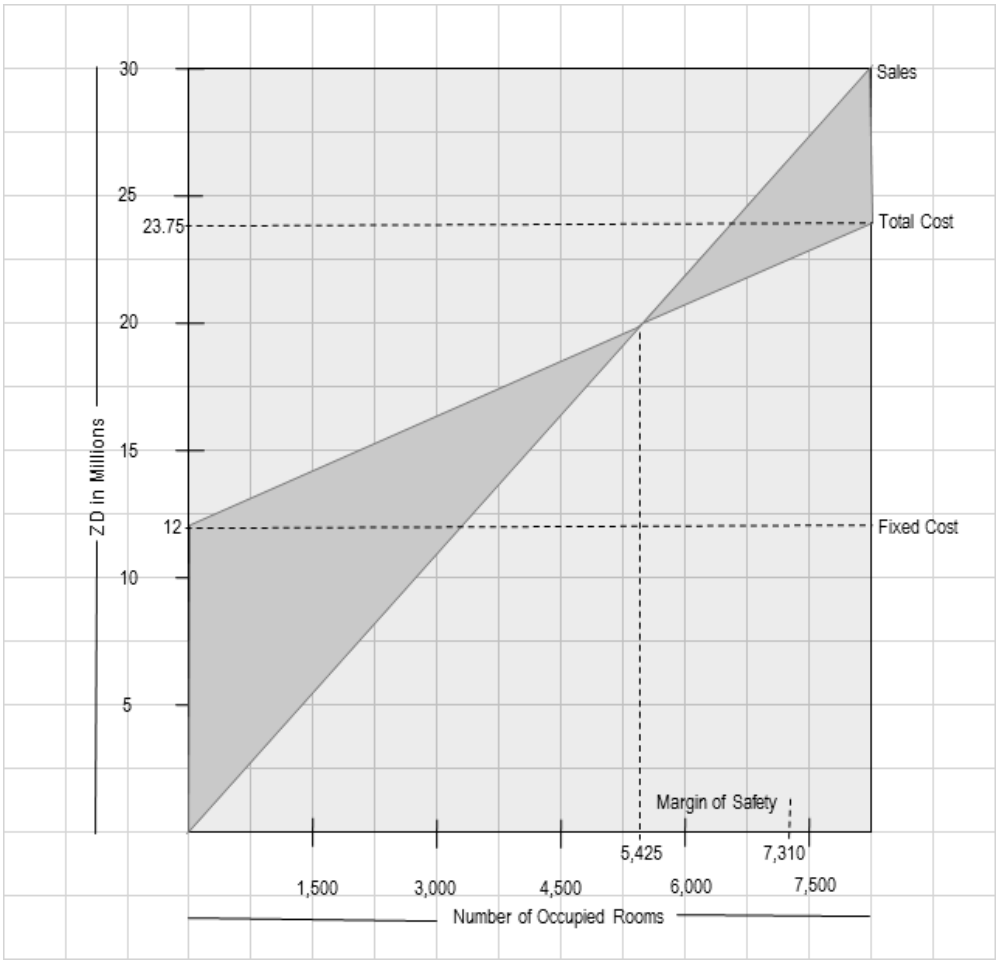
CVP Analysis

7. **Hotel Nauru**, Zeeland, an affordable leisure hotel resort is an ideal retreat to escape, unwind and enjoy peace of mind. Set amid expansive tropical greenery in the enclave of Zeeland, Hotel Nauru is designed for pleasure, where services reign supreme and Italian-style architecture of its 25 classic rooms harmonize with nature. Hotel Nauru, Zeeland is a beachfront resort that features a good choice of swim-up pool bar, gym, and variety of restaurants. A wide array of water sport activities like surfing, sailing, jet skiing etc. are available from beach operators at walking distance. The hotel is synonymous with enjoyment and value for money, with a large choice of very attractive "All Inclusive" packages.

Nauru charges guests ZD 2,700 per room per night, irrespective of single or double occupancy. The variable cost is ZD 900 per occupied room per night. The Nauru is available throughout 365 days a year and has a 75% budgeted occupancy rate. Fixed costs are budgeted at ZD 9 million and are incurred evenly during the year.

During the second quarter (Q2) of the year, usually the room occupancy rates remain substantially below the levels expected at other quarters of the year. Nauru is expecting to sell 900 occupied room nights during Q2. Management is considering strategy to improve profitability, including closing the Nauru for the duration of Q2 or adopting one possible option as follows –

There is scope to extend the Nauru by creating enough space to run a Rustic Chic, Italian Style restaurant to serve its guests. The annual revenues, costs and sales volumes for the combined operations are given in the following graph–



Note

Zeeland's home currency is the ZD.

Required

ANALYZE the profit improvement plan.

Cost of Quality

8. **Star Automobile Group** is among top 20 business houses in India. It has been founded in the year 1940, at the height of India's movement for independence from the British, the group has an illustrious history. Star's footprint stretches over a wide range of industries, spanning automobiles (two wheelers manufacturer and three wheelers manufacturer). Star's headquarter is located at Hyderabad. Bike Production is one of segment of Star Group. Management of Star wants to analyse the following actual information for the April:

Cost Data ₹

Customer Complaints Centre Cost	35 per hr.
Equipment Testing Cost	18 per hr.
Warranty Repair Cost	1,560 per bike
Manufacturing Rework Cost	228 per bike

Volume and Activity Data

Bikes Requiring Manufacturing Rework	3,200 bikes
Bikes Requiring Warranty Repair	2,600 bikes
Production Line Equipment Testing Time	1,600 hrs.
Customer Complaints Centre Time	2,000 hrs.

Additional Information

Due to the quality issues in the month, the bike production line experienced unproductive 'down time' which cost ₹7,70,000. Star carried out a quality review of its existing suppliers to enhance quality levels during the month at a cost of ₹1,25,000.

Required

(i) PREPARE a statement showing 'Total Quality Costs'.

(ii) ADVISE any TWO measures to reduce the non- conformance cost.

9. A company produces and sells a single product. The cost data per unit for the year 2021 is predicted as below:

	₹ per unit
Direct Material	35
Direct Labour	25
Variable Overheads	15
Selling Price	90

The company has forecast that demand for the product during the year 2021 will be 28,000 units. However, to satisfy this level of demand, production quantity will be increased?

There are no opening stock and closing stock of the product.

The stock level of material remains unchanged throughout the period.

The following additional information regarding costs and revenue are given:

- 12.5% of the items delivered to customers will be rejected due to specification failure and will require free replacement. The cost of delivering the replacement item is ₹5 per unit.
- 20% of the items produced will be discovered faulty at the inspection stage before they are delivered to customers.
- 10% of the direct material will be scrapped due to damage while in storage.

Due to above, total quality costs for the year is expected to be ₹ 10,75,556.

The company is now considering the following proposal:

1. To introduce training programmes for the workers which, the management of the company believes, will reduce the level of faulty production to 10%. This training programme will cost ₹4,50,000 per annum.
2. To avail the services of quality control consultant at annual charges of ₹ 50,000 which would reduce the percentage of faulty items delivered to customers to 9.5%.

Required

(i) PREPARE a statement of expected quality costs the company would incur if it accepts the proposal. Costs are to be calculated using the four recognised quality costs heads.

(ii) Would you RECOMMEND the proposal? Give financial and non-financial reasons (in brief).

Balanced Scorecard

10. **Z. Steels** is a leading manufacturer of flat and long products and have state-of the-art plants. These plants manufacture value added products covering entire steel value chain right from coal mining to manufacturing Pig Iron, Billets, HR Coils, Black Pipe/GI Pipe, Cable Tapes etc. conforming to international standards. The rock-solid foundation combined with nonstop upgradation and innovation has enabled the Z. Steels to surpass its goals constantly. Its vision and values for sustainable growth is balancing economic prosperity and social equality while caring for the planet. It is preparing its balanced scorecard for the year 2020-21. It has identified the following specific objectives for the four perspectives.

▪ Improve post-sales service	▪ Improve employee morale	▪ Improve employee job satisfaction
▪ Increase gross margin	▪ Increase number of customers	▪ Increase profitability of core product line
▪ Increase plant safety	▪ Increase customer retention	

Z. Steels has collected Key Performance Indicators (KPIs) to measure progress towards achieving its specific objectives. The KPIs and corresponding data collected for the year 2020-21 are as follows:

Key Performance Indicator	Goal	Actual
Average replacement time (number of days)	2	1.5
Gross margin growth percentage	15%	16%
Number of customers	15,000	15,600
Number of plant accidents	0	2
Percentage of repeat customers	83%	81%
Core product line profit as a percentage of core-product line sales	5%	4.4%
Employee turnover rate (number of employees leaving/ Average number of total employees)	2%	3%
Employees' satisfaction rating (1-5, with 1 being the most satisfied)	1	1.2

For preparation of Balanced Scorecard report, the following format has been developed:

Z. Steels Balanced Scorecard Report For the year ended March 31, 2021					
Perspective	**Objective**	**KPI**	**Goal**	**Actual**	**Goal Achieved (Yes or No)**
Financial	×	×	×	×	×
Customer	×	×	×	×	×
Internal Business Process	×	×	×	×	×
Learning and Growth	×	×	×	×	×

Required

(i) PREPARE a balanced scorecard report using the above-mentioned format. Place objective under the appropriate perspective heading in the report. Select a KPI from the list of KPIs that would be appropriate to measure progress towards each objective.

(ii) Z. Steels desires to integrate sustainability and corporate social responsibility related KPIs in their balance scorecard to adhere vision and values. ADVISE Z. Steels, using TBL framework.

Basic Concepts

11. Identify the correct pair of statement→

A	During _____ stage there is space for all, competitors and firms are focusing on keeping up with customer demand and not looking into the future.	(i)	Diversification
B	When the buyer has more access to information then he/ she can possibly switch products or even perhaps backwards integrate and make the products themselves. _____ power would decrease.	(ii)	Centralised
C	A health insurance firm moving into the operating fitness centre is an example of _____ strategy.	(iii)	Maturity
D	Lower switching costs mean that _____ will have more power.	(iv)	Supplier's
E	Major product differentiation and _____is usually considered a barrier to entry.	(v)	Growth
F	A_____organisation has many levels of management, vests decision-making authority at the top.	(vi)	Buyers
G	The_____is a high-level position and helps capture the organisation's fundamental purpose.	(vii)	Branding
H	A wine producer that uses grapes grown in its own winery is an example of _____.	(viii)	Mission
I	The life cycle stage _____ is characterised by slower growth, increased buyer power, supply meeting demand, and a shift towards efficiency.	(ix)	Vertical Integration
J	_____ helps management to report on the achievement of strategic goals/ objectives.	(x)	KPIs

SUGGESTED ANSWERS/HINTS

1. (i) Modern organizations have a moral duty of care to a *wider range of stakeholders* not just its owners / investors. In this case, it owes a duty of care to anybody who consumes its products. The presence of peanuts or peanut oil makes it a potential "health hazard" to some consumers. Food safety is a fiduciary duty that Nutty Bites owes to the society. Corporate Social Responsibility (CSR) is the duty an organization has towards a wider community.

(ii) Addressing this ethical issue will help Nutty Bites to become a *morally responsible organization*. The long- term benefits to its business could be as follows:

(a) Avoid bad publicity that could potentially damage its *reputation* and *brand image*.

(b) Avoid potential *legal action* for tort, committing a civil wrong.

(c) Operating environment within the business is more ethical, giving a *sense of well-being* to its employees.

(iii) Following could be some of the responses that Nutty Bites could take to address the issue:

(a) A *clear warning in the ingredients box* that the factory uses peanuts while manufacturing some of its products. This should be included even in products that do not contain peanuts, to avoid any harm due to risk of cross-contamination. Customers who suffer this allergy, would then be aware of the potential risk of consuming products of Nutty Bites. Protection from potential lawsuits counters any loss of business for Nutty Bites.

(b) Segregate areas to have *separate processing lines* for products with peanuts / peanut oil and those without it. If possible, have segregated staff for the two production lines in order to avoid the risk of cross-contamination. If this is not possible, staff have to be well trained on the risks of cross-contamination. Gloves need to be provided while handling material during production of food products. This should be changed each time staff handle production changes from "peanut variety" to the "non-peanut variety".

(c) Equipment should be *thoroughly cleaned* while switching production from one variety to another. *Fewer changeovers* in the production cycle, that is producing products in larger batches, reduces the number of switches during production of different varieties of food products.

(d) *Storage of peanut material* should be well segregated *and* monitored to avoid contamination.

(e) If Nutty Bites has the resources, it could *invest in pharma companies* that are finding a medical solution to this problem. The food industry could benefit from research and development of treatments to address this life-threatening allergy. A break-through would address a societal problem, while also having a positive impact for growth of Nutty Bites.

(iv) Risk of product safety is an important issue that needs constant review. Review would be of the production process, storage, material handling as well as ingredient of purchased raw materials. The benefit of constant review is that Nutty Bites can *immediately identify danger of contamination*. For example, is a supplier of raw material changes the production of the ingredients to include peanut / peanut oil, then Nutty Bites can be immediately aware of the change due to its review process. In case of any future litigation, Nutty Bites could defend itself by proving that it had a robust review process in place.

On the other hand, constant review requires *time* and *money*, with an ever-present possibility of contamination. It is not feasible to ensure complete safety. Reviewers / quality inspectors could become negligent once the process is well established. This could lead to instances of contamination, even with a review process in place.

To conclude, Nutty Bites is morally responsible to *spread awareness* that some of its products may contain allergy causing peanuts / peanut oil. It should streamline its storage and production process to avoid risk of cross-contamination.

2. (i) Cellwell Technologies Ltd. is in the **"Maturity" stage** of product lifecycle. It has been an *established player* in the cell phone market. The company has seen rapid sales growth. Over the last 2 years sales have been *increasing at a slower rate* due to increased competition. Therefore, the company has *decided to introduce a new product model* in the form of XXX21.

Retention of existing customers and trying to win over the competitor's customers is the strategy being used by Cellwell Technologies. The XXX21 model that enables customers to upgrade the software of their smartphone *enhances its product features*. This *differentiates the company's product* with that of its competitors. Technology changes at a fast pace. By enabling customers to upgrade their mobiles would definitely *improve performance*, lower customer complaints due to breakdown or compatibility issues due to older software. Improved performance along with longer product life would definitely enhance *customer satisfaction* as well as *attract newer customers*. The add on benefit is that the execution of this update can be managed from remote locations without the need for in person assistance.

The **offer to trade in old cell phones** while buying the latest XXX21 model would appeal to *price sensitive customers*. It will also evince interest of customers who are looking to dispose their cell phones that would otherwise end up in the landfill. The trade in offers monetary benefit in the form of a discount. This sale promotional offer

to trade old phones for a discount in the price of the latest model XXX21 would definitely help Cellwell Techonogies to *effectively compete* with its competitors.

Cellwell Technologies would have the *first mover advantage* by implementing both the product enhancing / differentiating feature in model XXX21 as well as the trade in options to customers. This shows that the management has a ***clear plan on how to effectively beat the competition***. This indicates that the company is now in the "Maturity" stage of product lifecycle.

(ii) Cellwell Techonogies has introduced a sales feature to allow trade in of older cell phone models in exchange for model XXX21 at a substantial discount. These phones would then be used in 2 ways (1) by refurbishing (repairing and renovating) or (2) recycling useful product parts and extracting precious metals and earth elements from the phones.

The ***refurbished phones*** would be sold at a substantially *lower price* to customers like students or lower income groups. Thus, the older cell phone model gets a ***new lease of product life*** after the requisite repairs. This extends its product life cycle by a further time frame until there may be no use of the cell phone model at all.

In the case of phones that are of no use/ completely dead, usable parts are being ***recycled*** into existing products. Thus, this becomes an *alternate source of material procurement* for the company *at a much lower cost*. *Consistent use of this measure would definitely reduce the cost of production by a certain margin*. The product lifecycle of such cell phones (dead phones) is ***not being extended***. However, they continue to provide *value to the company* with the help of the recycling process. The intangible benefit of this measure would be the *positive impact* that recycling would have *on the environment*. A move that would definitely enhance the company's *brand image*.

3. (i) Reconciliation Statement Budgeted and Actual Profit (Sep'2021)

Budgeted profit	1,94,375
Sales volume variance (F)	30,625
Sales price variance (A)	50,000
Shoe cost variance (F)	50,000
Staff cost variance -commission (F)	2,750
Staff cost variance -base wage (F)	3,125
Actual profit	₹2,30,875

(ii) Comment

The performance seems good. It shows that the supervisor of the WF passed on a 5.7% decrease in shoe cost to customers (same is also revealed through the entirely offsetting of the shoe cost variance and price variance), i.e. shoe costs decreased by ₹20 per pair, from a standard cost of ₹350 per pair to an actual cost ₹330 per pair. Additionally, the selling price decreased by ₹20 per pair, from a standard price of ₹500 per pair to an actual price of ₹480 per pair. In turn, the reduction in the selling price appeared to produce a favourable sales volume variance and a reasonable increase in profit.

Since the reduction in the selling price, staff commissions also were lower than budgeted. Moreover, the ₹50,000 reduction in revenue led to 0.055 × ₹50,000 = ₹2,750 less in commission costs.

Lastly, staffing was 25 hours under budget, leading to a savings of 25 × ₹125 = ₹3,125. Therefore, the supervisor attained an increase in sales with lesser staff hours.

Overall, it appears that the manager has done a great job of making revenue and controlling costs.

Workings

Statement Showing Budgeted and Actual Profit (Sep'2021)

	Budgeted Data	**Actual Data**
Units (pairs of shoes)	2,250	2,500
Price per pair of shoes	₹500.00	₹480.00
Cost per pair of shoes	₹350.00	₹330.00
Commission rate	₹27.50 (5.5% of ₹500)	₹26.40 (5.5% ₹480)
Contribution	₹122.50	₹123.60
Revenue	₹11,25,000	₹12,00,000
Less: Cost of shoes	7,87,500	8,25,000
Less: Staff – additional payment (commission)	61,875	66,000
Less: Staff – base wages	81,250	78,125
Profit	**₹1,94,375**	**₹2,30,875**

Computation of variances

Total Profit Variance = ₹2,30,875 – ₹1,94,375

= ₹36,500 (F)

Sales Contribution Volume Variance	= Standard Contribution – Budgeted Contribution
	= ₹122.50 × 2,500 – ₹122.50 × 2,250
	= ₹3,06,250 – ₹2,75,625 = ₹30,625 (F)
Sales Price Variance	= Actual Revenue – Standard Revenue
	= ₹480 × 2,500 – ₹500 × 2,500
	= ₹12,00,000 – ₹12,50,000 = ₹50,000 (A)
Shoe Cost Variance *	= ₹350 × 2,500 – ₹330 × 2,500
	= ₹8,75,000 – ₹8,25,000 = ₹50,000 (F)
Staff Cost Variance-commission*	= ₹27.50 × 2,500 – ₹26.40 × 2,500
	= ₹68,750 – ₹66,000 = ₹2,750 (F)
Staff Cost Variance (base wage)	= ₹81,250 – ₹78,125 = ₹3,125 (F).

(*) Note- *The cost variance (for both shoe and staff-commission) equal to the difference between the standard cost and the actual cost.*

4. Special Project Cost

Item of Cost	Comments / Working	Amount (₹)
Project financing: Interest of overdraft	Interest @10% on overdraft of ₹5,00,000 for 3 months [10% × ₹5,00,000 × (3months / 12 months)] **(Refer note 1)**	12,500
Materials	**(Refer note 2)**	7,50,000
Labour		
Outsourced labour cost	**(Refer note 3)**	6,25,000
Overtime paid to inspection supervisor	**(Refer note 4)**	25,000
Overheads	**(Refer note 5)**	
(a) Operating cost of machinery for special project	3 months	3,00,000
(b) Opportunity cost of diverting X-2.1" machine	Contribution lost ₹1,00,000 for 3 months	1,00,000
Administration overheads	Incremental cost **(Refer note 6)**	10,000
Total cost for accepting the project		**18,22,500**

Comment

Revenue to be earned from the project is ₹20,00,000 while the cost of accepting the project would be ₹18,22,500. The project can yield a surplus of ₹1,77,500. Therefore, the special project can be accepted.

Notes

Note 1: Project financing for 3 months through overdraft of ₹5,00,000 at interest of 10% per annum.

This is a relevant cost since it is an incremental cost to be incurred only if the project is accepted. The incremental cost is the interest to be paid on the overdraft of ₹5,00,000 for 3 months. At the end of three months, the overdraft will be repaid in full, therefore there will be no further incremental cost.

Note 2: Material cost

The company already has material worth 5,000 kg in its inventory. This is a sunk cost that has already been incurred. Materials requirement for this project is 3,000 kg which can be sourced from the current inventory of 5,000 kg. This material could have been sold as scrap at ₹250 per kg. However, since 3,000 kg of this material can be used for this project, the sale proceeds from the scrap sale of 3,000 kg would be the opportunity cost that has to be accounted for. This is the cash inflow forgone if the project is accepted.

Replacement cost of 3,000 kg at ₹300 per kg would be irrelevant since there is no need to buy this material, it is already in inventory. Also the material has no further immediate use, so there is no need to replace it.

Note 3: Labour cost – cost of in-house production vs cost of outsourcing the work for the project

Five skilled workers from other departments would need to devote 2,000 hours for this project. They are paid at ₹300 per hour. They are fully working in their respective departments and are not idle. The cost of labour of these 5 workers for 2,000 hours would be a relevant cost for the project.

Total hours by 5 skilled workers = 2,000 hours

Rate per hour = ₹300 per hour

Labour cost for in house skilled workers= 2,000 hours × ₹300 per hour = ₹6,00,000

To this, the loss of contribution for diverting the skilled workers' hours for the project represents an opportunity cost that is a relevant cost. This is the revenue forgone if the project is undertaken.

Total labour cost for in house production

= cost of skilled workers + contribution lost (opportunity cost)

= ₹6,00,000 + ₹1,00,000 = ₹7,00,000

The cost of outsourcing the work for this project is ₹6,25,000. Since the quality of work is the same under both options it is cost effective to outsource the labour for this special project. Therefore, the relevant cost for the special project is ₹625,000.

Note 4: Overtime paid to inspection supervisor

Overtime paid to inspection supervisor specially for this project is an incremental cost, a relevant cost.

Note 5: Machine X-2.1"

The operating cost of X-2.1" ₹3,00,000 is an incremental cost, therefore a relevant cost.

The depreciation of ₹40,000 per annum on it is a sunk cost and hence not relevant.

This machine X-2.1" works at full capacity, no idle time. Hence the contribution loss of ₹1,00,000 for the three-month period due to this diversion will be an opportunity cost that has to be accounted for. This is revenue forgone if the project is accepted.

Note 6: Administrative overhead

Allocation of administrative overhead of ₹25,000 is not a relevant cost since this is a sunk cost already incurred. Incremental administrative cost of ₹10,000 incurred specifically for the project is a relevant cost and hence has to be accounted for.

5. Workings

Statement Showing Benefit from Prospective Export Contract

	₹
Direct Material	2,250
Direct Labor (2 hrs. × ₹60)	120
Leakage Testing	75
Variable Overheads (including packing)	321
Export Clearance Charges on FOB term	54
Total Relevant Cost	2,820
AUD to INR	54.5
Relevant Cost	AUD 51.74
Price Offered by Customer	AUD 52.50
Benefit *per extinguisher*	AUD 0.76
No. of Extinguishers	30,000
Total Benefit	AUD 22,800

Advise

From financial perspective, it will be profitable for FS to accept the contract because of gain of AUD 22,800 (₹12,42,600) 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, FS 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, FS 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, FS 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 FS, it is worthwhile to know the current and future demand of fire extinguisher and factors influencing the growth of global fire extinguisher market. FS 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, FS should evaluate whether shipment date is attainable or not. If the target shipment date could not be met, what will be the charges? Further, FS 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, FS should accept the proposed contract only after due and careful consideration of above factors.

6. (i) Statement Showing "M-9's Life Cycle Cost (1,20,000 units)"

Particulars	**Amount (₹)**
Costs of Design and Development of Molds, Dies, and Other Tools	12,37,500
Manufacturing Costs (₹83 × 1,20,000 units)	99,60,000
Selling Costs (₹32 × 1,20,000 units + ₹80,000 × 4)	41,60,000
Administration Costs (₹1,23,000 × 4)	4,92,000
Warranty	
(1,20,000 units / 20 units × 4 parts × ₹8)	1,92,000
(1,20,000 units / 750 units × 2 visits × ₹350)	1,12,000
Total Cost	**1,61,53,500**

(ii) Following ways are suggested to maximize "M-9" lifecycle return:

R&D Costs

Often significant part of cost is incurred at the R&D phase of new product, hence AMD should carefully plan and design its new product "M-9" as it will determine the number of parts, production process to be used etc. AMD can apply ***value engineering*** here. It involves improving product quality, reducing product costs, fostering innovation, eliminating unnecessary and costly design elements, ensuring efficient investment in product, and developing implementation procedures. Value engineering is most successful when it is performed early in product development stage. A value engineering study should be performed within the first 25-30% of the design effort prior to selecting the final design alternative. Here, it is also important that R&D team should work as a part of cross functional team i.e. (participate in a group of people from different functional areas), to minimise lifecycle cost and the production cycle time in new development.

Speed up the Product Launch

In cutthroat competitions, it is important for AMD to get new product "M-9" launch into the market as soon as possible since this will give "M-9" a ***long stay*** in the marketplace *without competition* in the market. Competitor always try to launch a rival product as quickly as possible in order to gain 'competitive edge'. AMD may lose overall profitability if it delays in launching of Product "M-9". It is usually worthwhile incurring extra costs to keep the launch on schedule or to speed up the launch.

7. The Present Profit of Hotel Nauru

Total Room Days = 25 Rooms × 365 days × 75% = 6,844

Profit = Total Contribution – Fixed Cost

= 6, 844 room days × (ZD 2,700 – ZD 900) - ZD 90,00,000

= ZD 33,19,200

If Nauru is Shut Down during Q2

Loss of Contribution {900 Room Days × (ZD 2,700 - ZD900)} = ZD 16,20,000

Nauru should not close its hotel during Q2. The fixed costs will still be incurred, and hotel closure would result in lost contribution of ZD16,20,000. This in turn would decrease annual profits by ZD16,20,000. In addition, Nauru could lose guests at other quarters of the year, particularly their regular business customers, who may perceive the Nauru as being *non-reliable*.

Proposal of Opening an Italian Restaurant

Opening a restaurant will increase the fixed costs of the Nauru from ZD 9 million p.a. to ZD 12 million p.a. Thus, annual increment of ZD 3 million.

Average Revenue per occupied room will rise from ZD 2,700 to ZD 3,636.36... (ZD 30 million / 8,250 rooms) because increasing guest expenditure in Italian restaurant.

The total cost predicted at a level of 8,250 occupied rooms is ZD 23.75 million which means the variable costs must be ZD 11.75 million (ZD 23.75 million – ZD 12 million fixed costs). This is a variable cost per occupied room of ZD 1,424.24… which is an increase of ZD 524.24…

Consequently, the breakeven point has gone up from 5,000 to 5,425 (as shown in the diagram) occupied rooms so the Nauru is required to sell more room nights to cover costs. However, budgeted occupancy is now 7,310 occupied room nights which is 80.11% occupancy (7,310/ 9,125). This provides a margin of safety of 1,885 occupied room nights or 25.79%. At 7,310 occupied room nights, Nauru's budgeted profit would be ZD 41,70,597 {7,310 × (ZD 3,636.36 – ZD 1,424.24) – 12 million} which is more than present budgeted profit by ZD 8,51,397. So, it is better for Nauru to go for opening an Italian Restaurant.

8. (i) Statement Showing 'Total Quality Costs'

Particulars of Costs	₹
Prevention Costs	
Supplier Review	1,25,000
Appraisal Costs	
Equipment Testing (₹18 × 1,600 hrs.)	28,800
Internal Failure Costs	
Down Time	7,70,000
Manufacturing Rework (₹228 × 3,200 bikes)	7,29,600
External Failure Costs	
Customer Complaints (₹35 × 2,000 hrs.)	70,000
Warranty Repair (₹1,560 × 2,600 bikes)	40,56,000
Total Quality Costs	**57,79,400**

(ii) The reporting of quality costs highlights the *cost of quality activities* at Star. The total quality costs statement clearly displays the relationship between conformance costs (prevention and appraisal costs) and non-conformance costs (internal failure and external failure costs) and the drivers of a reduction in the overall spending on quality. Statement indicates that only 2.16% of the total quality cost is the cost of preventing quality problems while 0.50% is the cost of appraisal activities. Thus, prevention and appraisal costs make up only 2.66% of total quality costs. In contrast, 97.34% of quality control costs are incurred for internal and external failure costs. Following two measures can be used to reduce non- conformance cost:

Total Productive Maintenance (TPM) is a system of maintaining and improving the integrity of production and quality system through *keeping all equipment in top working condition* so as to avoid breakdowns and delays in manufacturing processes. It involves identifying machines in every division (including planning, manufacturing, maintenance) and then planning & executing a maintenance programme covering their entire useful life.

In this scenario, TPM will help in reducing internal failure cost (i.e., downtime and manufacturing rework cost), which constitutes 25.95% of total quality cost, by keeping all equipment in good working conditions so that there is no downtime or machine breakdown and ensuring that all equipment run smoothly. If machines work properly, the chances of rework will reduce, ultimately will also reduce chances of warranty repair and customer complaints (comprising 71.39% of total quality cost which is major part of total quality cost).

Total Quality Management (TQM) aims at improving the quality of organisational output, including goods and services, through *continual improvement* of internal practices. Its objective is to eradicate waste and increase efficiency without compromising with the quality. It requires that company maintain this quality standards in all aspects of business by ensuring that things are done right the first time so that defects and waste are eliminated from operation.

It appears that Star is not a TQM company at present due to *huge disparity between conformance costs and non-conformance costs*. In order to make Star to be successful, all staff at Star must be engaged in the improvement process and share in the continuous improvement ethos. In order to establish a reputation as a high-quality bike manufacturer Star must ensure staff are focused on quality *and* attitudes changed toward the importance of conformance activities, for instance, Star can conduct third party inspection of raw material at supplier's workplace leading to maintenances of quality standards.

Overall, while applying above two measures, in the Star, consideration must therefore be given to the *optimum balance* between the costs of conformance and the costs of non-conformance.

9. (i) Statement of 'Expected Quality Costs'

Particulars	Current Situation (₹)	Proposed Situation (₹)
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) $\left(\frac{28,000\text{ units}}{87.5\%}\right)$; $\left(\frac{28,000\text{ units}}{90.5\%}\right)$	32,000 units	30,939 units
Number of units Replaced …(B) – (A)	4,000 units	2,939 units
External Failure Cost {4,000 units × ₹(35+25+15+5)}; {2,939 units × ₹(35+25+15+5)}	₹3,20,000	₹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) $\left(\frac{32,000\text{ units}}{80\%}\right)$; $\left(\frac{30,939\text{ units}}{90\%}\right)$	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 × ₹(35+25+15)}; {3,438 units × ₹(35+25+15)}	₹6,00,000	₹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 × ₹35}; {3,819.67 units × ₹35}	₹1,55,556	₹1,33,688
Internal Failure Cost …(D)+(E)	₹7,55,556	₹3,91,538

(ii) Recommendation

On purely *financial grounds* the company should not accept the proposal because there is an increase of ₹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.

☞

This question can also be solved by considering rejections of 3,500 units (12.5% of 28,000) Hence, total 31,500 units are required to be produced.

10. (i) Z. Steels

Balanced Scorecard Report
For the year ended March 31, 2021

Perspective	Objective	KPI	Goal	Actual	Goal Achieved (Yes or No)
Financial	Increase Gross Margin	Gross margin growth percentage	15%	16%	Yes

	Increase Profitability of Core Product Line	Core product line profit as a percentage of core product line sales	5%	4.4%	No
Customer	Increase number of customers	Number of Customers	15,000	15,600	Yes
	Increase customer retention	Percentage of repeat customers	83%	81%	No
Internal Business Process	Improve post sales service	Average replacement time (number of days)	2.0	1.5	Yes
	Increase plant safety	Number of plant accidents	0	2	No
Learning and Growth	Improve employee job satisfaction	Employees' satisfaction rating *(1-5, with 1 being the most satisfied)*	1	1.2	No
	Improve employee morale	Employee turnover rate *(Number of employees leaving/ Average number of total employees)*	2%	3%	No

(ii) "**Triple Bottom Line"** concept encourages companies to measure not only their *financial profits*, but also the impact that its operations have on the *society* and *environment*. Therefore, this framework measures the full cost of doing business by measuring the following bottom lines (i) Profit (ii) People and (iii) Planet.

Diminishing non-renewable resources have forced businesses to focus on *sustainable manufacturing*. This term refers to managing manufacturing processes such that they *minimize any negative impact on the environment* by conserving energy and natural resources. In many instances, improved operational efficiency not only reduces waste (thereby costs) but also improves product safety, it strengthens the *brand's reputation* and builds *public's trust* about the company. As a long- term strategy, this improves *business viability* and provides a *competitive edge* to the company. This concept is the "**Planet Bottom Line**" within the Triple Bottom Line framework. Metrics on the following aspects may be investigated to find out the *environment impact* of business operations:

- Material consumption
- Energy consumption
- Water utilization

- Emissions, treatment of effluents and waste (include emissions affecting air, water, and land)
- Fuel consumption by tracking freight and transportation costs
- Land utilization
- Recyclability and disposal of product

"Corporate Social Responsibility" enables the company to become conscious of the impact its operations has *on the society*. CSR programs, through philanthropy and volunteer efforts can forge a stronger bond between *itself*, *its employees*, and the *wider community*. Again, this improves both the *brand image* as well as builds *public's trust* about the company. This concept is the **"People Bottom Line"** of the Triple Bottom Line framework. Metrics on the following aspects maybe investigated to find out the *social impact* of business operations:

- Workplace environment and labour relations
- Occupational health and safety, accident rates
- Human rights practices – child labour, employee work-place security policies
- Training and education
- Equal opportunity employer – diversity of workforce and opportunities available for employees' growth
- Suppliers – local sourcing versus sourcing from external markets
- Philanthropy and volunteer programs organized
- Product safety in terms of customer health and safety
- Pricing of essential products to enable wider reach within the society
- Transparent and ethical business practices

Z Steels can study these aspects, determine the relevant metrics, and prepare periodic KPI reports that can help in measuring responsibilities towards sustainability and social impact.

11. Correct Pair

A	B	C	D	E	F	G	H	I	J
(v)	(iv)	(i)	(vi)	(vii)	(ii)	(viii)	(ix)	(iii)	(x)