Question 1

How does the company describe itself or its manufacturing plants from the following perspectives:

Question 1.1

Tesla Incorporated manufactures, designs, develops, sells and rents electric vehicles, energy generation and storage systems to the public. It renders services connected to its energy products. The company's segments are the automobile trade and energy generation and storage, aiming to expedite the world's transition to renewable energy.

Question 1.2

General Motors and Ford Motor Company are Tesla's major business competitors. As of November 2021, Tesla has a market value of $1.1 trillion, compared to $78 billion for Ford and $86 billion for General Motors. However, many companies are adopting electric vehicles, and Tesla wants to maintain its competitive advantage as the leader by making its products extremely difficult to reproduce. Their critical investment in research and development aims to produce more innovative technologies and expertise for their products. This more significant investment in R&D increases the barrier to entry in the battery and electric vehicle markets compared to other automobile firms, which has propelled Tesla to the position of market leader and innovator. Electric vehicle demand is expected to rise in the future years. Tesla continues to command a sizable market share in the United States and is positioned well for future growth compared to its competitors.

Question 1.3

Tesla's objective is to step up the global movement to sustainable energy. The corporation started as a niche differentiator in the vehicle sector and is now moving down with an extensive differentiator marketplace approach. Tesla first targeted high-tech vehicles with sustainable competitive gain to distinguish itself from traditional automobile producers with sustainable, green electric-powered cars. Tesla's powerful differentiation technique is a long-term strategy emphasising electric-powered vehicle automation, battery technology, and environmentally beneficial complementary merchandise like sunroof tiles and supplementary merchandise and services.

Question 1.4

Tesla employs best practices in operations management to increase efficiency while lowering costs. The effectiveness of Tesla's operations management, inventory management, and supply chain management is essential to the company's automotive production success. Tesla's competitive Operational strategy within the vehicle business is broad differentiation to focus on each segment by targeting premium purchasers and moving towards lower-price buyers. Supporting this fundamental strategy, the company discerns itself from the competition by increasing its research and development investment each year to ensure an extremely innovative, distinctive ecosystem for exponential returns. By introducing lithium battery technologies and acquiring corporate SolarCity, the company has evolved from a distinct segment discriminator to a broad differentiator business model. Tesla's investments in automation and research were a liability before 2015, and they turned into an asset in 2018–2019 thanks to its long-run sustainable competitive advantage in product quality and

innovation. Customisable automobiles, regular package upgrades, star panels, supercharging compatibility, and self-driving technologies distinguish their products.

Relationships with material suppliers have resulted in Tesla Lithium reserves that have assisted somewhat in cutting back the costs of their production lines. Tesla can reduce their material prices on batteries through R&D and automation to move downmarket with lower pricing. It's currently able to target customers within the vehicle market more broadly. Tesla' promoting division' sales are innovative, permitting online customisable orders. Elon Musk's Twitter account accounts for many of their unpaid media, with no sponsored advertising.

Tesla's stockpile of chipsets and robust efforts to prop up the supply of battery precursor materials can shield the business from many assembly constraints that several different EV automakers are seemingly facing. Unlike other automakers, Tesla sells to individuals rather than through franchised dealerships. Tesla believes in owning the sales channel. It'll accelerate product development, and it assists in improving the client experience.

Question 1.5

Tesla produces its automobiles in Fremont, California, USA. The company constructed a factory within their Fremont headquarters to support the production of 5,000 Model 3 automobiles per week. Furthermore, they manufacture crucial components of each car, including the battery pack, electric motor, and charger.

Tesla manufactures lithium-ion batteries in a Nevada subassembly factory and its Fremont headquarters. They also purchase critical manufacturing parts in the United States from China, Europe, and other parts of the world. In addition to automation and in-house parts, their production strategy of supply guarantees decreased supplier leverage. Tesla reduces buyer leverage by delivering customisable autos through their manufacturing techniques.

Because its Human Resources department prioritises productivity, Tesla has a strong work ethic culture and a high level of Total Quality Management indicators. Tesla promotes a culture in which employees are recognised and compensated for being creative and innovative to develop the company's technological capabilities.

Question 1.6

Tesla has been criticised previously for quality-control issues ranging from faulty paint, faulty touchscreens, and miss installed seats to unsightly panel gaps. Balancing and enhancing production without compromising quality has been a big challenge for Tesla. Over-promising and under-delivery issues were common in the early phases. Frequent global recalls revealed poor quality control.

Tesla spent money on factories and automation to enhance production and quality. Tesla perfects the staging component by constructing its automated performance efficiently and effectively. Tesla's automation technologies assist in automating entire workflows, learning, and automated adaption. In addition, robots help with assembly line tasks such as painting, welding, automated stamping and even the final assembly. While machines and robots can be advantageous to their assembly line, Tesla also replaces slow and inefficient robots with human personnel. Overall, automation is one of Tesla's many strengths that distinguishes them from other firms and allows them to supply vast quantities of unique automobiles required to meet the high demand.

Instead of relying on third-party vendors for parts, Tesla has become more involved in manufacturing. Tesla owns numerous Gigafactories worldwide; the Shanghai Gigafactory has already produced 150k (thousand) automobiles, and Tesla expects to make 500k+ vehicles in 2022. Instead of employing varied battery sizes in the Model 3, Tesla unified the battery size and streamlined operations in the Model 3. This change raises administrative costs while increasing quality and productivity.

Unlike other automakers, Tesla sells directly to people rather than franchised dealerships. Tesla believes that owning the sales channel will accelerate product development. More importantly, it improves the customer purchasing experience.

Question 1.7

Process design entails determining which types of work processes to include in creating a product in a specific way. The key to process selection is to balance the efficiency, costs, output, and quality of each production alternative to achieve production goals. The focus is on business processes and related investments, resources, and standards.

Tesla, Inc. incorporates automation to address this issue. The company automates production processes while still allowing human participation. This system enables Tesla to attain high productivity in the automotive and energy solutions industries through operational efficiency. This area of operations management also influences and is influenced by Tesla's organisational structure. Some components of the corporate structure, for example, are dependent on the business's related process and capacity requirements.

Layouts are created to enhance the capacity usage of facilities, particularly those utilised to manufacture electric vehicles. In addition, for internal communications, the corporation uses innovative computing and networking technologies. These methods boost productivity in Tesla's operations. In its manufacturing activities, the corporation also minimises distances between intermediary processes. The Nevada Gigafactory is one example of such reduction, which helps lower production costs while promoting vertical integration.

Question 1.8

Tesla assures resource adequacy through regular inventory monitoring that responds quickly to changes in market demand. The company achieves adequate production capacity with a small but significant amount of redundant processes and manufacturing resources. Tesla, for example, has surplus manufacturing capacity in certain of its facilities. This redundancy enables the firm to rapidly raise production in response to increases in market demand for electric vehicles. Tesla's productivity benefits from these operations management practices increase resilience and agility.

Question 1.9

Tesla currently has four fully operational plants. Three plants are in the United States, while one is in China. While Tesla has grown its manufacturing footprint around the world, the Fremont Factory remains the company's headquarters. Tesla manufactures the Model X, Y, S, Model 3 and most of each EV's components in this cutting-edge facility. While the factory receives parts from vendors worldwide, a handful has established themselves locally to be closer to Tesla's activities. Tesla is broadening its global footprint to provide the world with cheaper EVs, solar energy, and better energy storage.

Question 1.10

The overall product quality and price is representative of the companies pricing. Tesla's premium pricing approach entails setting high price points based on the uniqueness and the high worthiness of the company's products due to innovation. Customers are prepared to pay relatively high costs for Tesla autos, deemed technologically and environmentally advanced. As a result, innovation and product design are essential components in successfully implementing the company's approach to this component. Premium price aligns with the generic differentiation strategy, which stresses product uniqueness. Furthermore, through its subsidiary SolarCity, the corporation employs a market-oriented pricing approach for its solar panels and related products (services).

Question 2

Tesla uses a vertical integration approach. An example is not relying on suppliers and cutting the cost of finished goods. Tesla Inc's capacity to design components in-house allows the automaker to be more agile in making changes to parts and dealing with supply chain challenges that other manufacturers face much more impactfully. Tesla creates more hardware and writes more software than many competitors, who rely on car suppliers.

In addition, Tesla could substitute other chips for some in short supply. Most of the complicated software that powers their automobiles is designed in-house by engineers. They develop the electronics used in its driver assistance systems and manufactures components ranging from seats to battery cells in-house. It also has a network of direct sales, service, and charging stations. Tesla's direct relationships with semiconductor vendors moved more quickly than traditional manufacturers, who rely on first-tier suppliers. When they could not obtain the required chips, they took the existing chips from vendors, and the company updated the software to meet their requirements, something that other automakers cannot achieve.

The strategic importance of Tesla's logistical proximity to its resources, customers, and suppliers is essential. Besides the Tesla manufacturing unit in California, the enterprise has manufacturing facilities in Lathrop and the Netherlands, Gigafactories 1 and a couple in Nevada, Buffalo, and New York, which help assemble battery modules. They have their unique Tesla flagship shops without intermediaries, including sellers or marketing and marketing agencies, which depart from the standard revenue model of the auto industry.

Tesla's enterprise structure and approach are unique. It vertically integrates technology and methods throughout the value chain from sourcing to shipping, not utilising sellers to promote its vehicles. Logistics is a mission concerning delivering cars to clients. Tesla released a progressive door-to-door automobile shipping carrier called 'Tesla Direct' (Lambert, 2018). Because they no longer use a third-birthday birthday celebration courier carrier or sellers, that is an inefficient approach to managing car deliveries.

Tesla's collaboration with Toyota has helped lessen stock control expenses because of the deployment of the Just in Time method for incoming stock. However, as it assembles in reaction to purchaser demand, it maintains outgoing inventory to a minimum, lowering the

need for completed product storage space (Tao, 2014). It additionally reduces the danger and cost of holding excess items.

The company's production, procurement, and venture control structures are key supply chain components for optimising system processes and structures. The enterprise has a Requirement Management System for venture planning, ERP structures specifically designed for production operations. In addition, there is a Management System for data to assist with manufacturing and engineering processes. A Facilities System manages the facility to ensure that the facility functions effectively and safely. It is easy to combine electronics and software programs in electric-powered vehicles, resulting in more intelligent automobiles. Tesla is leading connectivity innovation by making all software program adjustments online.

Implementing a triple bottom line and a Sustainable Supply Chain Management practice and strategy, including technological trends in material science, robotics, artificial intelligence, IoT, and sustainable energy sources, addresses the challenges of raw material scarcity, political instability, weather changes, and labour aspects. In a networked economy, the aim is to keep a holistic delivery chain by breaking down partitions among organisation teams and partners.

Question 3

Tesla has amended its systems and process and is committed to lowering emissions upstream of its manufacturing facilities, including the carbon footprint of supply chains. Localising suppliers decreases the distance parts must travel before being assembled into automobiles and the accompanying emissions. Supplier localisation benefits the community and workers while reducing the risk of supply disruptions due to geopolitical dynamics and tensions. Tesla's strategy and localisation strides to produce critical modules like the internal seats and battery pack drive unit. The American index Cars.com ranks cars based on five factors:

- Production Assembly location,
- Local parts content,
- Engine or powertrain origin,
- The Transmission origin,
- And US labour content.

Today's cell manufacture consumes much energy because it includes enormous ovens. Tesla demonstrated a revolutionary technique to build cells utilising a dry electrode process at Tesla's 2020 Battery Day. According to the company's latest analysis, the new dry electrode methodology enables conversion from an anode or cathode powder substance to an electrode film, reducing energy consumption by more than 70% throughout the cell manufacturing phase.
While the conversion to internal cathode materials is expected to take longer than the conversion to internal cells, the cathode materials production technology can reduce energy consumption in this process step, which is performed by suppliers, by 40%.

Building localised industries makes financial sense and gets rid of wastage because the automobile supply chain lacks a presence in the Western region of the United States. Many raw materials are despatched from far distances, necessitating more packaging and causing greater waste than is necessary. Further, present-day industries are greener in terms of

material flow. Trailer entrance factors are strategically located across the facility, permitting components to be offloaded where they are needed. A shorter journey necessitates much less protective packaging, less raw material flow results in less waste.

Question 4

Strengths:

A Leading Employer

An organisation is only as excellent because of the people that work for the organisation. In the case of Tesla, it is one of the number one motives for its exceptional success. Tesla has emerged as an incredible company to work for because of its diverse and innovative culture. It was named one of the quality workplaces, attracting younger job seekers with new talents and drive. The organisation became additionally named an 'America's Best Employer 2019' through Forbes.

The Most Valuable Automobile Firm

Despite its challenges, Tesla's sales increased in the last quarter of 2021, with 90,650 vehicles delivered to consumers. The surge in deliveries increased the company's market capitalisation to reach $208 billion, surpassing Toyota's market capitalisation of $202 to become the world's most valuable carmaker by market value.

Best-in-Class Electric Vehicles

Tesla became the first to set up this revolutionary technology, and it benefited Tesla as it is an established brand. Tesla has surpassed all brands in the battle to supply first-class electric powered motors. According to a recent analysis concerning range, Tesla ranks first, second, and third in range variability. The Tesla Model S will take you the farthest, with a single battery charge permitting you to journey as much as 595 kilometres. The closest competitor is the Opel Ampera, which ranges 520 kilometres. Tesla has placed itself in the new electric-powered vehicle industry with top-rated vehicles and long-range capacity variants. They currently offer electric powered automobile models that cater to a diverse purchaser market to affordability, luxury, and car longevity. Tesla's specific strengths in current years of manufacturing were how they'd constructed models of electric cars that attract the middle-class consumer.

Innovation Company

Tesla has a very high innovation rate. As a result, the market trusts and expects the company to manufacture competitive and profitable products, which will result in significant financial advantages. In terms of direct consumer selling, they have positioned themselves in a blue ocean sector with exponential growth. Tesla's primary strength is eliminating the middleman in selling their electric vehicles. By removing the intermediary from the selling process, Tesla has used their unique business model to save money that would otherwise be spent on periodic maintenance and tune-ups for vehicles that run on gasoline.

Weaknesses:

Manufacturing challenges

Tesla Inc.'s initial shortcoming has to have been the cost of its cars. Tesla saw a gross margin of 25% on the Model S and X at a production pace of 5,000 units per week, reinforcing its position as the leader in EV production. However, as a manufacturer of highly sophisticated electric automobiles, Tesla was faced with the challenge of delivering a model that appealed to middle-class buyers. Tesla also manufactures all models "in-house," resulting in high production per-unit costs. The newly announced Model 3's initial profit margins were questioned due to its high production costs of $28,000 and $35,000 selling price.

Tesla made a loss in the first quarter of Model 3 manufacturing due to the fixed expenses connected with the vehicle while also accounting for depreciation. Until the third quarter, Tesla could balance the production expenses to a similar output level as the Model S and X, which evenly dispersed those costs at a 5,000 unit per week production quota. When creating and manufacturing all units in-house, pricing methods can be challenging to balance. Still, Tesla appears to have overcome this problem through trial and error at various stages of production, maintenance, and tune-ups.

Trial and error phases

The trial and error phases of production have proven difficult for Tesla. In theory, if done right, manufacturing all models from start to finish should be advantageous to any organisation. However, as history has proven, it can also reduce production quality, raising overhead costs due to technological limitations. Tesla Inc. needs to improve various parts of the manufacturing process. They must decide whether to automate the assembly of their electric vehicles entirely or to evenly balance the production process between "man-made" and robotics as considered appropriate. It will be a challenge that Tesla must overcome during the manufacturing process to keep production costs as low as feasible to achieve the maximum possible profit margins.

Opportunities

Environmental Sustainability

Tesla has built a unique product that appeals to younger generations regarding environmental longevity. The unwavering pursuit of a sustainable future in energy efficiency aligns with Tesla Motors' ambition. The push for the development of electric vehicles can cut emissions that contribute to the unavoidable climate change. Regardless of political opinions, we can see that the inspiration for electric cars has trumped all other political goals to provide a cleaner and safer environment for future generations.

Software as a Service(SaaS)

Another untapped option for future expansion that Tesla has is a car manufacturer and distributor and a "software-as-a-service" company. The push toward self-driving automobiles, together with the continued popularity of technology, is the future of the automobile business. When autonomous vehicles become the norm, drivers will convert to passengers and spend their time in the car doing things that interest them rather than

controlling the vehicle itself. Autonomous vehicles will appeal to a consumer base similar to the "green movement," Tesla's critical skills are required.

Expansion of global facilities

The completion of more Giga factories, in which they can create batteries for electric automobiles, is the most critical potential that Tesla has aligned for the future of this company. Tesla's Giga factory enables them to lower costs proportionally and support economies of scale caused by pricing concerns revolving around the Model 3 pricing dilemma. The Giga factory will also help them save costs and move toward a cleaner source of electricity.

Competition

Ford invented the first automobile, while Tesla invented the first electric vehicle. To completely comprehend a competitive analysis, you must compare organisations that compete in the same industry. In comparison, no other company manufactures entirely electric vehicles. Competitors are still developing electric cars to compete with Tesla in the blue ocean. Ford, a well-known and well-established firm in the automobile industry since 1903 is one major competitor. Ford sells the "Focus Electric," which is the company's only fully electric vehicle. Ford's current model lineup includes some hybrids but only one fully electric vehicle. The Focus Electric, which debuted in 2009, was Ford's most significant attempt at a fully electric vehicle to date.

All automakers are now striving to build the most value-added, creative electric vehicle on the market. The main issue for the companies is that Tesla has a head start and has continued to innovate in terms of value in its products. Ford is now attempting to acquire a competitive advantage by developing self-driving cars that use artificial intelligence. According to Medium.com, they invested $1 billion in a startup in 2017 to help them improve this notion. They hope that these automobiles will bring groceries from Walmart to your door. There is competition in a massive industry like vehicles, which Ford deals with daily. We cannot dismiss that Ford faces threats such as intense competition from Tesla.

Question 5

Nearly two years after the world's firsts COVID case, the supply chain is still suffering a series of catastrophic firsts. Unreliability on the carrier is at an all-time high whilst freight rates are at an all-time high and warehouse openings are at an all-time low.

The supply chain is at the top of the priority list. For the first time, corporate CEOs in a McKinsey study identified supply chain disruption as the most significant danger to growth for their companies and their countries' economies in October 2021. More important than the COVID-19 epidemic, labour shortages, geopolitical insecurity, war, and internal conflict. The businesses claim they have implemented new supply-chain management systems, including diversifying to reduce reliance on China.

Automakers have spent decades fine-tuning and refining just-in-time(JIT) systems have begun to abandon them because they do not operate when crucial components are in limited supply. To secure future supplies, Toyota, Volkswagen, Tesla, and others store batteries, chips, and other critical components. Keeping goods and labour to a minimum can help save money unless some unforeseeable event occurs, such as a pandemic.

Because of JIT, many firms were found wanting when lockdowns were implemented, preventing them from ordering raw materials affecting their operations and consumer happiness due to stock-outs. While cost-cutting is crucial, keeping the business functioning and consumers satisfied is even more critical. As a result, many organisations are reconsidering their supply chain priorities.

Buyer-supplier relationships have shifted, the loss of essential supply chain connections has resulted in new partnerships and co-development ventures between OEMs and suppliers. Concerned about the scarcity of semiconductors, Ford and General Motors have forged strategic alliances with chipmakers. More broadly, it is recognised that resilience is hard to achieve unless customers, suppliers, and other parties along the value chain are prepared to share data and collaborate. According to a new Reuters investigation, Where's My Stuff? Corporations might exchange sensitive, closely held data with partners by establishing "cleanrooms" where collaborative teams can undertake analysis without the danger of competitive information leaking. Blockchain technology, which allows for safe, access-controlled data exchange, could potentially be helpful in data sharing.

Aside from diversifying supplier locations, businesses are now focusing on deepening their supplier network, i.e., adding new suppliers. According to a Mckinsey poll, only 2% of organisations currently have more than two levels of suppliers. If alternative suppliers are not immediately available, a corporation should decide how much extra stock to keep on hand, in what form, and where along the value chain. Of course, safety stock, like any inventory, has the danger of obsolescence as well as tying up capital. It contradicts the belief in just-in-time replenishment and lean inventories. However, the savings from these techniques must be balanced against all of the consequences of a disruption, such as lost revenues and higher pricing.

Tesla has a marketplace capitalisation of $888.89 billion as of February 2022. This places Tesla as the world's 6th leading company in marketplace capitalisation. Aside from the immediate changes cited above, the pandemic has triggered numerous minor changes in the supply chain. COVID-19 has established the need for Chief Supply Chain Officers. Supplier relationships have additionally altered dramatically. Companies intend to reinforce resilience by imparting real-time visibility and tracking of the quit-to-quit deliver chain and state of affairs, making plans and simulations. Companies have also resolved to make their delivery chains dynamic, agile, and flexible.

Tesla maintains supply record profits and sales as the call for electric-powered vehicles (EVs) rises. Despite the pandemic, EV income in the United States more than doubled last year. However, supply chain interruptions have plagued the worldwide car sector, along with a semiconductor shortage. In dealing with the semiconductor scarcity, Tesla has been one of the most successful vehicles. The EV manufacturer's competent in-house software program engineers completed this by rewriting the software program with unique processors utilised in Tesla vehicles.

As noted from the quarterly reports, Tesla's car deliveries for the quarter detail that compared to the comparable quarter last year, overall deliveries for Q4 FY 2021 expanded via way of means of 70 percent to 308,600. Tesla has not been the best in response to the worldwide shortage of semiconductors; however, its clients have needed to deal with prolonged waiting periods and delivery times attributable to delivery difficulties. At various points throughout

the year, Tesla has needed to reschedule its claimed delivery dates. In addition, the employer is dealing with growing contention from different EV manufacturers, including Volkswagen AG (VOW3) and General Motors Co. (GM).

The company's robust car deliveries in every one of the four quarters of FY 2021 enabled Tesla to increase overall annual deliveries by 87 percent, which surpassed Tesla's goal of fifty percent growth for the yr and an acceleration of growth in comparison to the previous years. Annual vehicle deliveries accelerated by 49 percent in the financial yr 2019 and by 35 percent in the monetary yr 2020. FY 2021 turned into an excellent start. In the first 1/2 of the yr, quarterly vehicle deliveries accelerated by 108 percent yr on yr in Q1, accelerating to 121 percent in Q2. Growth slowed to 72 percent in Q3 and 70 percent in Q4 FY 2021.

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