**Operations Management**

**April 2025 Examination**

**1. Discuss the importance of an effective layout design in operations management and compare the various layout types commonly implemented in manufacturing and service industries, outlining their advantages and disadvantages. Then, evaluate the specific challenges and opportunities related to both electric vehicle (EV) assembly plants and traditional automotive assembly lines. Conclude by recommending the most appropriate layout for each, justifying how the chosen layout optimally addresses the distinct requirements and operational challenges of each format. (10 Marks)**

**Ans 1.**

**Introduction**

Effective layout design is a cornerstone of operations management, directly influencing productivity, cost efficiency, and customer satisfaction. The layout of a facility determines how resources, including equipment, labor, and materials, are organized and utilized. For manufacturing and service industries, layout design optimizes workflows, minimizes waste, and enhances safety. The emergence of electric vehicle (EV) assembly plants has added complexity to layout considerations, given the distinct production processes, components, and technological requirements compared to traditional automotive assembly lines. Each type of

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**2. Amazon Fresh is a prominent online grocery delivery platform that has gained popularity for its seamless operations and timely deliveries. A crucial factor contributing to its success is its advanced inventory management system. Discuss the concept of Amazon Fresh and how it differs from traditional brick-and-mortar grocery stores. Highlight various inventory management techniques commonly used in the e-commerce grocery industry and evaluate the key components and strategies implemented by Amazon Fresh to ensure operational efficiency and enhance customer satisfaction. (10 Marks)**

**Ans 2.**

**Introduction**

Amazon Fresh has emerged as a leading online grocery delivery platform, transforming how customers access daily essentials. Its business model combines convenience, a wide selection of products, and advanced technology to deliver fresh groceries directly to customers' doorsteps. Unlike traditional brick-and-mortar grocery stores, Amazon Fresh leverages e-commerce to provide a seamless shopping experience, offering advantages like personalized recommendations, real-time inventory updates, and flexible delivery options. At the core of Amazon Fresh's operations lies an advanced inventory management system, which ensures product availability, minimizes waste, and streamlines the supply chain. This essay delves

**3. A renowned artisanal coffee shop chain is planning to open a new mid-sized outlet in your locality. Leveraging their expertise in brewing and branding, they are confident about efficiently managing the new coffee shop's operations. The shop’s offerings and the associated requirements are as follows:**

**• Standard single orders (e.g., cappuccinos, lattes): Require 1 barista for 5 minutes per order.**

**• Extended multiple orders (e.g., group orders): Require 2 baristas, each working for 8 minutes per order.**

**• Custom beverages (e.g., personalized drinks): Require 3 baristas, each working for 10 minutes per order.**

**The demand forecast for the next four weeks is as follows:**

|  |  |
| --- | --- |
| **Order Type** | **Anticipated Demand (Next 4 Weeks)** |
| **Standard single orders** | **3000** |
| **Extended multiple orders** | **1500** |
| **Custom beverages** | **500** |

**a. Estimate the aggregate capacity required to fulfill the anticipated demand for the next four weeks. If the coffee shop employs 15 baristas, working 6 days a week for 8 hours per day, calculate the current capacity available. Compare the required capacity with the available capacity to determine if the shop can meet the demand. If not, calculate the additional capacity needed. (5 Marks)**

### **Ans 3a.**

#### **Introduction**

Capacity planning is a critical component of operations management, ensuring that resources are adequately aligned with anticipated demand. For a coffee shop handling various order types, it is vital to calculate the total aggregate capacity required to meet customer demand and compare it with the available capacity. This ensures timely service, operational efficiency, and customer satisfaction. The following analysis estimates the aggregate capacity needed for the coffee shop’s next four weeks and evaluates whether the current staffing levels

**b. Propose strategies to address the issue of underutilization of capacity and calculate the number of baristas required to meet 100% capacity utilization. (5 Marks)**

### **Ans 3b.**

#### **Introduction**

Underutilization of capacity is a common challenge in operations management, leading to inefficiencies and increased costs. By optimizing resource allocation and balancing workloads, the coffee shop can enhance productivity and achieve better utilization. This section discusses strategies to address underutilization and calculates the number of baristas