

**Online PGDM**

**Second Year, Trimester V, Sep 2024**

**Course Name : Sustainable Operations Management**

**Max Marks : 70**

**Course Code : 5113**

**Max Time : 2 hrs**

*Instructions for Students:*

*(1) Section A contains 10 questions of 2 marks each. You have to highlight the correct option with yellow*

*(2) Section B will have 2 questions of 5 marks each. You needs to answer in 50 to 60 words*

*(3) Section C will have 2 Case studies, comprising of 4 questions for 10 marks each*

**Section A: Objective Type Questions**

Max. Marks-20

- 1. Which of the following best describes the "Triple Bottom Line" approach in sustainable operations?**
  - a) A strategy that focuses on maximizing shareholder value.
  - b) A framework that emphasizes environmental sustainability only.
  - c) A method that measures a company's social, environmental, and financial performance.
  - d) A policy focused solely on reducing operational costs.
  
- 2. In sustainable supply chain management, which of the following practices is most likely to reduce carbon emissions?**
  - a) Just-in-time inventory management
  - b) Sourcing from multiple global suppliers
  - c) Implementing energy-efficient logistics
  - d) Outsourcing production to lower-cost regions
  
- 3. Which of the following is a key principle of the "circular economy" model in sustainable operations?**
  - a) Linear production and disposal of goods.
  - b) Continuous use of resources through recycling and reusing.
  - c) Maximizing the production of single-use products.
  - d) Prioritizing short-term financial gains over long-term sustainability.
  
- 4. Which of the following is the most effective strategy for reducing water usage in a manufacturing facility?**
  - a) Increasing production speed to reduce water consumption per unit.
  - b) Installing low-flow fixtures and reusing process water.
  - c) Outsourcing production to areas with abundant water resources.
  - d) Reducing workforce size to decrease overall water demand.

**5. Which of the following is a benefit of adopting sustainable operations in a business?**

- a) Increased short-term profits due to reduced operational costs.
- b) Enhanced brand reputation and customer loyalty.
- c) Faster product lifecycle leading to quicker market entry.
- d) Elimination of all regulatory compliance costs.

**6. In sustainable operations, what is "life cycle assessment" primarily used for?**

- a) To evaluate the financial performance of a product over its lifetime.
- b) To assess the environmental impact of a product from cradle to grave.
- c) To determine the potential market demand for a new product.
- d) To identify the most cost-effective production methods.

**7. Which of the following is a key advantage of using renewable energy sources in sustainable operations?**

- a) Immediate reduction in capital costs.
- b) Dependence on non-renewable resources.
- c) Consistent energy prices and reduced greenhouse gas emissions.
- d) Increased complexity in energy management.

**8. Which sustainable practice in operations management is most likely to improve the efficiency of material usage?**

- a) Implementing a lean manufacturing system.
- b) Increasing the production volume.
- c) Centralizing supply chain management.
- d) Extending product lines to meet diverse market demands.

**9. What is the primary focus of sustainable procurement practices?**

- a) Minimizing costs through bulk purchasing.
- b) Selecting suppliers based solely on price.
- c) Ensuring that products and services are sourced responsibly, with consideration for environmental and social impacts.
- d) Reducing the number of suppliers to streamline operations.

**10. What is the purpose of a "carbon footprint analysis" in sustainable operations?**

- a) To calculate the financial cost of environmental initiatives.
- b) To assess the total greenhouse gas emissions associated with a product or operation.
- c) To measure the energy efficiency of a company's facilities.
- d) To determine the market demand for eco-friendly products.

**Section B : Subjective Type Questions (Short Answer Questions)**

Max. Marks-10

**Q1.** Identify what are the key elements of sustainable operations management and how they are relevant for commitment to sustainability goals? Illustrate with 2 examples

**Q2.** How can the results of a life cycle analysis (LCA) be used to improve the sustainability of a product or service?

**Section C : Subjective Type Questions (Long Answer Questions)**

Max.Marks-40

**Case -1: Building Sustainability at the Orlando Magic's Amway Center**

When the Amway Center opened in Orlando in 2011, it became the first LEED (Leadership in Energy and Environmental Design) gold-certified professional basketball arena in the country. It took 10 years for Orlando Magic's management to develop a plan for the new state-of-the-art sports and entertainment center. The community received not only an entertainment centre but an environmentally sustainable building to showcase in its revitalized downtown location. "We wanted to make sure we brought the most sustainable measures to the construction, so in operation, we can be a good partner to our community and our environment," states CEO Alex Martins. The new 875,000-square-foot facility—almost triple the size of the Amway Arena it replaced—is now the benchmark for other sports facilities Here are a few of the elements in the Amway Center project that helped earn the LEED certification:

- ◆ The roof of the building is designed to minimise daytime heat gain by using reflective and insulated materials.
- ◆ Rainwater and air-conditioning condensation are captured and used for irrigation.
- ◆ There is 40% less water usage than in similar arenas (saving 800,000 gallons per year), mostly through the use of high-efficiency restrooms, including low-flow, dual-flush toilets
- ◆ There is 20% energy savings (about \$750,000 per year) with the use of high-efficiency heating and cooling systems.
- ◆ The centre used environmentally friendly building materials and recycled 83% of the wood, steel, and concrete construction waste that would have ended up in a landfill.
- ◆ There is preferred parking for hybrids and other energy-efficient cars.
- ◆ The centre is maintained using green-friendly cleaning products.

LEED certification means five environmental measures and one design measure must be met when a facility is graded by the U.S. Green Building Council, which is a nationally accepted benchmark program. The categories are sustainability of site, water efficiency, energy, materials/resources, indoor environmental quality, and design innovation. Other Amway Center design features include efficient receiving docks, food storage layouts, and venue change-over systems. Massive LED electronic signage controlled from a central control room also contributes to lower operating costs. From an operation management perspective, combining these savings with the significant ongoing savings from reduced water and energy usage will yield a major reduction in annual operating expenses. "We think the LEED certification is not only great for the environment but good business overall," says Martins.

**Q1.** List the components that a facility needs to earn the gold LEED rating. What other ratings exist?

**Q2.** Explain why the Orlando Magic decided to “go green” in its new building

**Case -2: Green Manufacturing and Sustainability at Frito-Lay**

Frito-Lay, the multi-billion-dollar snack food giant, requires vast amounts of water, electricity, natural gas, and fuel to produce its 41 well-known brands. In keeping with growing environmental concerns, Frito-Lay has initiated ambitious plans to produce environmentally friendly snacks. But even environmentally friendly snacks require resources. Recognizing the environmental impact, the firm is an aggressive “green manufacturer,” with major initiatives in resource reduction and sustainability. For instance, the company’s energy management program includes a variety of elements designed to engage employees in reducing energy consumption. These elements include scorecards and customized action plans that empower employees and recognize their achievements. At Frito-Lay’s factory in Casa Grande, Arizona, more than 500,000 pounds of potatoes arrive every day to be washed, sliced, fried, seasoned, and portioned into bags of Lay’s and Ruffles chips. The process consumes enormous amounts of energy and creates vast amounts of wastewater, starch, and potato peelings. Frito-Lay plans to take the plant off the power grid and run it almost entirely on renewable fuels and recycled water. The managers at the Casa Grande plant have also installed skylights in conference rooms, offices, and a finished goods warehouse to reduce the need for artificial light. More fuel-efficient ovens recapture heat from exhaust stacks. Vacuum hoses that pull moisture from potato slices to recapture the water and to reduce the amount of heat needed to cook the potato chips are also being used. Frito-Lay has also built over 50 acres of solar concentrators behind its Modesto, California, plant to generate solar power. The solar power is being converted into heat and used to cook Sun Chips. A biomass boiler, which will burn agricultural waste, is also planned to provide additional renewable fuel. Frito-Lay is installing high-tech filters that recycle most of the water used to rinse and wash potatoes. It also recycles corn byproducts to make Doritos and other snacks; starch is reclaimed and sold, primarily as animal feed, and leftover sludge is burned to create methane gas to run the plant boiler. There are benefits besides the potential energy savings. Like many other large corporations, Frito-Lay is striving to establish its green credentials as consumers become more focused on environmental issues. There are marketing opportunities, too the company, for example, advertises that its popular Sun Chips snacks are made using solar energy. At Frito-Lay’s Florida plant, only 3.5% of the waste goes to landfills, but that is still 1.5 million pounds annually. The goal is zero waste in landfills. The snack food maker earned its spot in the National Environmental Performance Task Program by maintaining a sustained environmental compliance record.

**Q4.** Illustrate the pressures a firm such as Frito-Lay faces to become resource-conscious. Explain with an example

**Q5.** Select any other business organisation and compare its waste management policies with those of Frito-Lay