**JAIPURIA INSTITUTE OF MANAGEMENT, NOIDA**

**PGDM / PGDM (M) / PGDM (SM)**

**FIFTH TRIMESTER (Batch 2023-25)**

**END TERM EXAMINATIONS, JANUARY 2025**

**Reappear EXAM**

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| --- | --- | --- | --- |
| Course Name | Materials and inventory management | Course Code | **20528** |
| Max. Time | **2 hours** | Max. Marks | **40 MM** |

**INSTRUCTIONS:**

1. All questions are compulsory.
2. Use of simple/ scientific calculators is allowed.
3. Exchange of calculators and/ or stationery items is not allowed.

Q.1. A local manufacturing company produces industrial machines and need capacitors in quantities. They face a recurring challenge in minimizing inventory costs. The annual demand for the capacitors is 25,000 units, and they incur an ordering cost of $10 per order. The annual holding charge per unit is 20% of unit cost which is $10 per unit.

1. Solve for economic order quantity (EOQ) for capacitors. **(2 Marks)**
2. If the company decides to place an order for 1,000 units each time instead of the EOQ, determine the additional cost incurred compared to the EOQ cost. **(6 Marks)**

Q.2. A retail store, "Tech Gadgets," specializes in selling electronic devices and accessories. The store manages a variety of products, including smartphones, headphones, chargers, cables, and other electronic gadgets. The store wants to optimize its inventory management by applying ABC analysis, which helps classify the items based on their importance and contribution to overall sales. The following 10 items are currently stocked by the store for which unit price and annual demand is as follows: **(10 Marks)**

| **Item Number** | **Item Name** | **Unit Price ($)** | **Annual Demand (Units)** |
| --- | --- | --- | --- |
| 1 | Smartphone | 500 | 300 |
| 2 | Laptop | 1000 | 150 |
| 3 | Bluetooth Speaker | 80 | 500 |
| 4 | Headphones | 100 | 200 |
| 5 | Portable Charger | 20 | 800 |
| 6 | Smartwatch | 150 | 400 |
| 7 | USB Cables | 10 | 1000 |
| 8 | Mouse | 30 | 700 |
| 9 | Laptop Bag | 50 | 300 |
| 10 | Power Bank | 40 | 500 |

Q.3. A dealer has 60 units of smartphones in his stock. If he needs to order more smartphones, it takes 1week to receive them after placing an order. He can place an order for a fixed quantity (lot size) of 300 units. Based on the orders at hand and forecasted demand, he has generated the gross requirement of smartphones for the next 8 weeks, as follows:

| Week | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Gross Requirement | 150 | - | 100 | 120 | - | 150 | 100 | - |

Propose a Material Requirement Plan (MRP) for the smartphones, considering the available stock, minimum stock requirement, and the forecasted demand for the next 8 weeks. The dealer is required to maintain a minimum stock of 80 units to meet any uncertain demand. **(8 Marks)**

Q.4. A company produces small wooden stools. Each stool consists of one stool frame, one stool seat and one finishing kit each of which further include some parts or sub-assemblies mentioned below:

* **1 Stool Frame**
  + Requires 4 Legs and 2 Braces
  + Each Leg requires 2 Screws
* **1 Stool Seat**
  + Requires 4 Screws and 1 Cushion
* **1 Finishing Kit**
  + Contains 1 Paint Can (shared across 10 stools)

If the company plans to produce 50 stools,

1. Create the product structure tree with all components listed clearly in a hierarchical format. **(4 Marks)**
2. Determine the net quantity need to be ordered for each of the following components to complete the order of 50 stools considering the available on hand inventory for each item mentioned below:
   * Legs -5
   * Braces-3
   * Screws-75
   * Cushions-0
   * Paint Cans-2 **(6 Marks)**

Q.5. “To increase the profitability of a company it is always advised to reduce the cost as compared to increase the revenue”. Explain. **(4 Marks)**