ME324: IEOR

Assignment 06: EOQ and EPQ

Department of Mechanical Engineering, IIT Guwahati

Q 1. The Moore-funn Novelty Company buys 80,000 shipping containers each year. The following costs are applicable: P = \$0.40 per container, C_o = \$80.00 per order, and C_h = \$0.10 per container per year. Calculate (a) Economic order quantity, (b) The number of order to place in one year, (c) Time between orders, based on 220 working days per year, and (d) The total annuls stocking cost for shipping containers.

Q 2. An automobile manufacturing company is purchasing an item from outside suppliers. Demand is 10,000 units per annum. Cost of the item is Rs. 5 per unit and procurement cost is estimated to be Rs. 100 per order. Cost of carrying inventory is 25 per cent of cost of item. If the consumption rate is constant (a) determine EOQ, (b) Total inventory cost, (c) Optimum number of orders per annum and, (d) Re-order level, assume 200 working days per year and lead time is 5 days.

Q 3. In question 2, the consumption rate of automobile manufacturing company is demand per day. However, it receive 200 items per day from the outside supplier. (a) Determine optimal order size.

Q 4. A company annually orders one million pounds of a certain raw material for use in its own curing process. With the annual holding cost estimated at 35% of the purchase price of \$50 per 100-pound bag, the purchase manager wants to decide on an order size. Marginal paperwork cost are \$10 per order. For order of 500 bags or more, the purchase price falls to \$45 per bag; for orders of 1000 bags or more, the price is \$40 per bag. What is the optimal order size?

Q 5. Find the optimal reorder point for the following item using percent order safety stock. Mean demand is 400 units, with standard deviation of 100 units. Setup costs are \$50 per order, and inventory costs are \$1.3 per unit per year. The desired service level is 95%, and average lead time is 7 days with standard deviation of 1 day. Hint: When both demand and lead time are uncertain, the ROL or ROP can be found as

$$ROL = \bar{d} \times \overline{LT} + z\sqrt{(\overline{LT} \times \sigma_d^2) + (\bar{d}^2 \times \sigma_{LT}^2)}$$

Due date is 20 April 2022. Submit the assignment hard copy during the lecture.