JAIPURIA INSTITUTE OF MANAGEMENT

LUCKNOW NOIDA JAIPUR INDORE

JAIPURIA INSTITUTE OF MANAGEMENT, NOIDA

PGDM / PGDM (M) / PGDM (SM)

FIFTH TRIMESTER (Batch 2022-24)

END TERM EXAMINATIONS, JANUARY 2024

Course Name	Materials and Inventory Management	Course Code	**20257**
Max. Time	**2 hours**	Max. Marks	**40 MM**

INSTRUCTIONS:

a. All questions are compulsory.
b. Use of simple/scientific calculators is allowed

Q.1. (a) Discuss the principle on which ABC analysis is based. (3 Marks)

(b) Classify the items based on ABC analysis for the given data. (7 Marks)

Item	Annual number of units sold	Cost per unit
Boxes of paperclips	21,000	£0.50
Boxes of staples	10,000	£0.50
Correcting fluid	16,000	£1.50
Diaries	50,000	£3.50
Erasers	15,000	£0.10
Notepads	40,000	£2.00
Pencils	80,000	£0.03
Pens	120,000	£0.05
Rulers	15,000	£0.25
Staplers	10,000	£1.50

Q.2. A plant manager must determine the lot size of a product that has a steady demand of 30 units per day. The production rate is 190 units per day, annual demand is 10,500 units, set up cost for a production run is 200.00 and holding cost is 0.21 per unit. Plant operates for 350 days per year. With this information calculate: (2.5*4 = 10 Marks)

a) Economic production lot size

b) Total annual cost

c) Time between orders (TBO) or cycle length

d) Production time per lot

Q.3. Use graphical method to determine the time needed to process the following jobs on the machines shown below. Also, determine the total processing time to complete the jobs.

(10 Marks)

Job 1	Sequence	A	B	C	D	E
	Processing time (hrs)	3	4	2	6	2
Job 2	Sequence	B	C	A	D	E
	Processing time (hrs)	5	4	3	2	6

Q.4. A dealer has 47 units of desktop in his stock. If in case he needs to order more desktops, it takes 2 weeks to receives them after placing an order. Also, he can place an order for a fixed quantity (lot size) of 200 units. Based on the orders at hand and forecasted demand he has generated the gross requirement of desktops for next 8 weeks, which is as follows:

(10 Marks)

Week	1	2	3	4	5	6	7	8
Gross requirement	150	-	-	120	-	150	120	-

Propose a material requirement plan for the desktops, assuming that dealer need to maintain a minimum stock of 50 units to meet any uncertain demand.

formula Sheet

$$(Q^*)EOQ = \sqrt{\frac{2DS}{H}} \quad \text{(Basic EOQ Model)}$$

$$(Q^*)EOQ = \sqrt{\frac{2DS}{H}\left(\frac{H+C_s}{C_s}\right)}$$

- $$M^* = \sqrt{\frac{2DS}{H}\left(\frac{C_s}{H+C_s}\right)}$$

$$TVC^* = \sqrt{2DSH\left(\frac{C_s}{H+C_s}\right)}$$

EOQ model with shortages

$$Q^*)EOQ = \sqrt{\frac{2DS}{H}\left(\frac{p}{p-d}\right)}$$

- $$TVC^* = \sqrt{2DSH\left(\frac{p-d}{p}\right)}$$

EOQ Model with non-instantaneous supply

$$\text{Monetary unit size inventory} = \sqrt{\frac{2DS}{L}}$$

$$\text{Service level} = \frac{\text{no. of orders per years} - \text{no. of stockout tolerated per yr}}{\text{no. of orders per year}}$$