Question 1: Sharp Inc; a company that markets painless hypodermic needles to hospitals would like to reduce its inventory cost by determining the optimal number of hyperdemic needles to obtain per order. The annual demand is 1000 units, the setup cost or ordering cost is $10 per order, and the holding cost per unit per year is $0.50. Calculate:

    a. The optimal number of units per order (EOQ).

    b. The number of orders (N).

    c. The expected time between orders (T).

    d. The ROP. (Assume a 250 – day working year).

Question 2: Consider the data in the table below.

Discount number	Discount quantity	Discount (%)	Discount price($)
1	0 –500	0	5.00
2	501-1000	4	5.00*96%=4.80
3	1001 -1500	5	5.00*95%= 4.75
4	1501 - 2000	10	5.00*90%= 4.50

Setup cost is $20. Inventory carrying charge as a percentage of cost, I, is 25%. Given that the unit price is $5.00, what order quantity will minimize the total inventory cost?

Question 3: There is only one copying machine in the students' hostel of the Polytechnic. Students arrive at the rate of 80 per hour according to a Poisson distribution. Copying takes an average rate of 180 per hour according to an exponential distribution. Find the:

   i. Percentage of time the machine is used

   ii. Average time spent waiting in the queue

  iii. Average time spent in the system

   iv. Average number in the system

   v. Average number in a queue

Question 4: Sharp Inc; a company that markets hypodermic needles to hospitals would like to reduce its inventory cost by determining the optimal number of hypodermic needles to obtain per order. The annual demand is 1000 units, the setup cost or ordering cost is $10 per order, and the holding cost per unit per year is $0.50. Assuming that the company has a 250 – day working year, calculate:

   i. The optimal number of units per order

   ii. The number of orders

iii.   The expected time between orders

iv.   Demand per day.

v.   The reorder point.

Question 5: L & K Ltd,. is having a problem trying to control inventory. There is insufficient time to devote to all its items equally. Here is a sample of some items stocked, along with the annual usage of each item expressed in dollar volume.

Item	Annual dollar Usage	Item	Annual dollar Usage	Item	Annual dollar Usage
A	7,000	H	80,000	O	900
B	1,000	I	400	P	1,700
C	14,000	J	1,100	Q	2,300
D	2,000	K	30,000	R	12,000
E	24,000	L	1,900	S	3,000
F	68,000	M	800	T	32,000
G	17,000	N	90,000		

i.   Specify where each item from the list would be placed in terms of ABC classification (Use 10%, 30% and 60% respectively for A,B, and C)

ii.   Item "h" is critical to continued operations. How would you recommend it to be classified?