

Practice #9
Solutions
EOQ
BUAD311 – Operations Management

1) This is a probability mass function. Fill in the blank

| | | | | | | |
|-------------|-----|-----|------|------|-----|------|
| Probability | 0.2 | 0.1 | 0.15 | 0.17 | 0.3 | 0.08 |
| Value | 1 | 2 | 3 | 4 | 5 | 6 |

2) Compute the expected value of random variable X

| | | | | | | |
|-------------|-----|-----|-----|-----|-----|-----|
| X | 10 | 11 | 12 | 13 | 14 | 15 |
| Probability | 0.1 | 0.1 | 0.1 | 0.2 | 0.3 | 0.2 |

$$10 \cdot 0.1 + 11 \cdot 0.1 + \dots + 15 \cdot 0.2 = 13.1$$

3) Random variable X is normally distributed with mean 0 and standard deviation 1. Compute the following probabilities.

- a. $\Pr(X < 0)$ 0.5
- b. $\Pr(X < 0.52)$ 0.6985
- c. $\Pr(X < 1)$ 0.8413

4) Random variable X is normally distributed with mean 10 and standard deviation 2. Compute the following probabilities.

- a. $\Pr(X < 10)$ 0.5
- b. $\Pr(X < 11.04)$ 0.6985
- c. $\Pr(X < 12)$ 0.8413

5) Random variables X and Y are both normally distributed with mean 100 and standard deviation 4. It is known that random variable X+Y is also a normal distribution.

- a. What is the mean of X+Y? 200
- b. What is the standard deviation of X+Y? $\sqrt{2} \times 4 \approx 5.66$

6) If we classify inventory by the location, (fill in the blank)

- a. Raw material
- b. Work-in-process
- c. Finished goods

7) State two of the assumptions of EOQ model.

Demand is known.

Demand rate is constant.

No stock-out is allowed.

Setup cost is known. So is holding cost.

We assumed, in class, instantaneous delivery but it's not generally assumed.

8) If we order Q units every time, what is the average inventory?

$$\frac{Q}{2}$$

9) If we order more every time (if Q is large), is annual holding cost larger or smaller?

Larger.

10) Solve the following EOQ problem:

$$S=10$$

$$H=12$$

$$D=6000$$

$$\text{EOQ} = 100$$

11) You solved the following EOQ problem:

$$S=15$$

$$H=15$$

$$D=450$$

And came up with the correct answer of EOQ=30. How many times do you place an order in a year?

$$450/30 = 15 \text{ times}$$

12) You solved the following EOQ problem:

$$S=10$$

$$H=10$$

$$D=200$$

And came up with the correct answer of EOQ=20. What is the annual holding cost?

$$(20/2)*10=100$$

13) You solved the following EOQ problem:

$$S=10$$

$$H=10$$

$$D=200$$

$$C=20$$

And came up with the correct answer of $EOQ=20$. What is the annual total cost?

4200

14) As the setup cost increases (and other things equal), EOQ

- a. increases
- b. decreases
- c. remains the same

a. increases

15) As the holding cost increases (and other things equal), you order

- a. more frequently
- b. less frequently
- c. as frequently as before

a. more frequently