STAT 211, Quiz 3 T112 Form: **A**

Name: ID#: Serial#:

Question One (4 Points)

Write **True** if the statement is true or **False** if not**:**

1. The probability of success in the binomial distribution can be approximated well by the normal distribution if np $\geq$ 5 and nq $\geq$ 5. _____
2. The mean and the variance of an exponential random variable are the same. _____
3. P(X = 45) is not zero if X is a continuous random variable. _____
4. In the uniform distribution, all intervals of equal length have the different probability. _____

Question Two (6 Points)

Choose the Best answer.

1. If the ratio of defective items in a shipment is 20%, a sample of size 300 is taken randomly with replacement, then the probability of at most 40 defective item is approximately:
   a. 0.000684752 b. 0.0015 c. 0.9985 d. 0.9993

2. The yearly incomes for a group of professional people is normally distributed with mean μ = \$60,000 and standard deviation σ = \$5000. Then out of 20,000 of these people, the number of these people who have a yearly income over \$70,000 is:
   a. 228 b. 456 c. 10228 d. 19544

3. If X has a uniform distribution over the interval $[-2,3]$, the $P(X \leq 0) =$
   a.0 b. 0.4 c. - 0.4 d.0.6

Question Three (10 Points)

1. If on the average three cars arrive per hour at KFUPM emergency medical center. Find the probability that there will be at most 30 minutes waiting between arrival of 2 successive cars.

2. The maturity time of a bond is a random variable having the normal distribution with Mean = 4.76 years and standard deviation = 0.04 year. What is the probability that this kind of bond will mature anywhere from 4.70 to 4.82 years?

NOTE: For some questions above, you may use your z-table or one of the following areas where

z_0	**-1.5**	**-0.5**	**0.5**	**1.5**	**2.0**	**2.25**
$P(Z \leq z_0)$	**0.0668**	**0.3085**	**0.6915**	**0.9332**	**0.9772**	**0.9878**

STAT 211, Quiz 3 T112 Form: **B**

Name: ID#: Serial#:

Question One (4 Points)

Write **True** if the statement is true or **False** if not**:**

1. The probability of success in the binomial distribution can be approximated well by the normal distribution if $np \geq 5$ or $nq \leq 5$. _____
2. The mean and the variance of an exponential random variable are different. _____
3. $P(X = 45)$ is not zero if X is a continuous random variable. _____
4. In the uniform distribution, all intervals of equal length have the same probability. _____

Question Two (6 Points)

Choose the Best answer.

1. The number of a customers in a certain bank follow a Poisson distribution with an average of five customers per hour, then the probability of the time between customers is less than 30 minutes is:
   a. 0.0001 b. 0.0821 c. 0.9179 d. 0.9999

2. If the ratio of defective items in a shipment is 20%, a sample of size 300 is taken randomly with replacement, then the probability of at most 40 defective item is approximately:
   a. 0.000684752 b. 0.0015 c. 0.9985 d. 0.9993

3. The yearly incomes for a group of professional people is normally distributed with mean μ = \$60,000 and standard deviation σ = \$5000. Then out of 20,000 of these people, the number who have a yearly income over \$70,000 is:
   a. 228 b. 456 c. 912 d. 10228

Question Three (10 Points)

1. The maturity time of a bond is a random variable having the normal distribution with Mean = 4.76 years and standard deviation = 0.04 year. What is the probability that this kind of bond will mature anywhere from 4.70 to 4.82 years?

2. The number of a customers served by a certain bank has an average of fifteen customers per hour, find probability of the time between serving two consecutive customers is less than 5 minutes.

NOTE: For some questions above, you may use your z-table or one of the following areas where

z_0	**0.2**	**0.5**	**1.5**	**2.0**	**2.2**	**2.25**
$P(Z \leq z_0)$	**0.5793**	**0.6915**	**0.9332**	**0.9772**	**0.9861**	**0.9878**

STAT 211, Quiz 3 T112 Form: **C**

Name: ID#: Serial#:

Question One (4 Points)

Write **True** if the statement is true or **False** if not**:**

1. The probability of success in the binomial distribution can be approximated well by the normal distribution if np $\geq$ 5 or nq $\geq$ 5. _____
2. The mean and the variance of an exponential random variable are different. _____
3. P(X = 45) is zero if X is a continuous random variable. _____
4. In the uniform distribution, all intervals of equal length have the different probability. _____

Question Two (6 Points)

Choose the Best answer.

1. If the ratio of defective items in a shipment is 20%, a sample of size 300 is taken randomly with replacement, then the probability of at least 40 defective item is approximately:
   a. 0.000684752 b. 0.0015 c. 0.9985 d. 0.9993

2. Customers arrive at an ATM teller at a rate of 20 per hour. What is the probability the next customer will arrive in 6 minutes?
   a. 0.9548 b. 0.8647 c. 0.1353 d. 0.04524

3. The yearly incomes for a group of professional people is normally distributed with mean μ = \$60,000 and standard deviation σ = \$5000. Then out of 20,000 of these people, the number who have a yearly income over \$70,000 is:
   a. 228 b. 456 c. 912 d. 10228

Question Three (10 Points)

1. If on the average three cars arrive per hour at KFUPM emergency medical center. Find the probability that there will be at most 45 minutes waiting between arrival of 2 successive cars.

2. If X is uniformly distributed over the interval [-3, 2], find P($X \geq$ -1).

NOTE: For some questions above, you may use your z-table or one of the following areas where

z_0	**0.2**	**0.5**	**1.5**	**2.0**	**2.2**	**2.25**
$P(Z \leq z_0)$	**0.5793**	**0.6915**	**0.9332**	**0.9772**	**0.9861**	**0.9878**

STAT 211, Quiz 3 T112 Form: **D**

Name: ID#: Serial#:

Question One (4 Points)

Write **True** if the statement is true or **False** if not**:**

1. The probability of success in the binomial distribution can be approximated well by the normal distribution if np $\leq$ 5 and nq $\geq$ 5. _____
2. The mean and the variance of an exponential random variable are different. _____
3. P(X = 45) is zero if X is a continuous random variable. _____
4. In the uniform distribution, all intervals of equal length have the different probability. _____

Question Two (6 Points)

Choose the Best answer.

1. If the ratio of defective items in a shipment is 20%, a sample of size 300 is taken randomly with replacement, then the probability of at least 40 defective item is approximately:
   a. 0.000684752 b. 0.0015 c. 0.9985 d. 0.9993

2. Customers arrive at an ATM teller at a rate of 20 per hour. What is the probability the next customer will arrive in 6 minutes?
   a. 0.9548 b. 0.8647 c. 0.1353 d. 0.04524

3. The yearly incomes for a group of professional people is normally distributed with mean μ = \$60,000 and standard deviation σ = \$5000. Then out of 20,000 of these people, the number who have a yearly income over \$70,000 is:
   a. 228 b. 456 c. 912 d. 10228

Question Three (10 Points)

1. If on the average three cars arrive per hour at KFUPM emergency medical center. Find the probability that there will be at least 45 minutes waiting between arrival of 2 successive cars.

2. If X is uniformly distributed over the interval [-3, 2], find P($X \leq$ -1).

NOTE: For some questions above, you may use your z-table or one of the following areas where

z_0	**0.2**	**0.5**	**1.5**	**2.0**	**2.2**	**2.25**
$P(Z \leq z_0)$	**0.5793**	**0.6915**	**0.9332**	**0.9772**	**0.9861**	**0.9878**