

Name:

ID#:

Serial#:

Section#: 5 6

Write neatly and eligibly

③ Q1: (3 Points)

At checkout customers arrive at an average of 1.5 per minute, what is the probability that at least 3 will arrive within 2 minutes?

$$\lambda = 1.5 / \text{min}, t = 2 \Rightarrow \lambda t = 3, X: \# \text{ of Customers arrive per 2 min}$$

$$X: P_0(3) \Rightarrow f(x) = \frac{e^{-3} 3^x}{x!}, x = 0, 1, 2, \dots$$

$$P(X \geq 3) = 1 - P(X < 3) = 1 - P(X \leq 2) = 1 - 0.4232 = \boxed{0.5768}$$

Q2: (7 Points)

In a certain class of 30 students the probability that a randomly selected person has a computer is 0.6.

② a. If four persons are selected at random, what is the probability that at least 3 of them have no computers?

X: # of persons with NO computers out of 4.

$$X \sim B(4, 0.4) \Rightarrow f(x) = \binom{4}{x} (0.4)^x (0.6)^{4-x}, x = 0, 1, 2, 3, 4$$

$$P(X \geq 3) = 1 - P(X < 3) = 1 - P(X \leq 2) = 1 - 0.8208 = \boxed{0.1792}$$

② b. What is the probability that the first person that has a computer is the third one?

X: # of persons selected until the 1st with a computer selected

$$X: G(0.6) \Rightarrow f(x) = (0.6)(0.4)^{x-1}, x = 1, 2, \dots$$

$$P(X = 3) = (0.6)(0.4)^2 = (0.6)(0.16) = \boxed{0.096}$$

③ c. If 10 students were selected one by one and asked, what is the probability that only 4 of them have computers?

$$N = 30, n = 10, K = 18$$

X: # of persons with computers out of 10 from a population with 30 persons.

$$X: H G(30, 10, 18) \Rightarrow f(x) = \frac{\binom{18}{x} \binom{12}{10-x}}{\binom{30}{10}}, x = 0, 1, \dots, 10$$

$$P(X = 4) = \frac{\binom{18}{4} \binom{12}{6}}{\binom{30}{10}} = \boxed{0.0941}$$

With My Best Wishes