Arwa's Exam – Second

Q1 True or false

1. In most applications, continuous random variables represent counted data, while discrete random variables represent measured data. (F)
2. For a random variable x, the word random indicates that the value of x is determined by chance. (T)
3. The mean of the random variable of a probability distribution describes how the outcomes vary. (F)
4. The expected value of a random variable can never be negative. (F)
5. If the sample size is at least 30, then you can use z-scores to determine the probability that a sample mean falls in a given interval of the sampling distribution (T)

Q2 Find the $P(z < -2.46 \text{ or } z > 2.46)$: Ans(A)

A) 0.0069   B) 0.0096   C) 0.0138   D) 0.00128

Q3 About 63% of the residents in a town are in favor of building a new high school. One hundred five residents are randomly selected. What is the probability that the sample proportion in favor of building a new school is less than 55%? Interpret your result.

Q4 In a game of chance, three fair coins are tossed simultaneously. If all three coins show heads, Then the player wins $15. If all three coins show tails, then the player wins $10. Any other combination will result in not winning any money. If it costs $5 to play, what is the player's expected not gain or loss after three games? Ans (D)

A) The player can expect to gain $15 after two games.

B) The player can expect to gain $1.88 after two games.

C) The player can expect to gain $3.75 after two games.

D) The player can expect to lose $5.64 after two games.

E) The player can expect to lose $3.75 after two games.

Q5 Which of the following is NOT a property of binomial experiment? Ans(A)

A) It has 3 outcomes each time and trials are dependent.

B) Trails don't influence each other.

C) Each trail has two outcomes.

D) The probability of success is constant for each trail.

E) Trails are independent, and the probability of success is constant for each trail.

Q6 which of the following is true regardless the standard normal distribution: Ans(B)

I. It has mean of 0 and variance is 1
II. It is symmetric about 0.
III. It has a mean always greater than the median

A) I only   B) I and II only   C) I and III only   D) II and III only.

Q7 A multiple choice exam consists of 12 questions, each question has 4 answers, only one is correct, if a student answers randomly, then the probability of getting at most one correct answer is: Ans (B)

A) 0.2301   B) 0.159   C) 0.1032   D) 0.0401   E) 0.1532

Q8 Determine whether the random variable x is discrete or continuous.

1. Let x represent the number of houses owned by someone. (Dis)
2. Let x represent the length of time it takes to complete an exam. (Cts)
3. Let x represent the number of rainy days in Jordan. (Dis)
4. Let x represent the height of a student. (Cts)

Q9 The grades are normally distributed with mean 65.8 and variance 25 , the minimum of the top 30% of the grades is : Ans (C)

A) 67.5   B) 64.6   C) 68.4   D) 73   E)70

Q10 It is known that 60% of the male students are smoking. In a sample of
size 100, let $\hat{P}$ be the sample proportion. The standard deviation of $\hat{P}$: Ans(B)

   A) 0.24   B) 0.049   C) 0.034   D) 0.0024

Q11 A sampling distribution is the probability distribution for which one of the
following: Ans (D)

   A) A population   B) A population parameter

   C) A sample   D) A sample statistics

Q12 In a recent year, the mean number of strokes per hole for golfer Steven
Bowditch was about 2.3. Find the probability that he would play a 4-holes round and
have no more than 2 strokes. Ans = 0.0053

Q13 A hospital specializes in treating overweight patients. These patients have
weight that are independently, normally distributed with mean 200kg and
standard deviation 15kg. The elevator in the hospital will break if the total
weight of people inside it exceeds 6060kg. 30 patients enter the elevator.
The probability that the elevator will break equals: Ans (C)

   A) 0.7673   B) 0.6064   C) 0.2327   D) 0.1357   E) 0.0143

Q14 The life span (in kilometers) for a population of a new brand of tires can be
approximated by a normal distribution, with a mean of 80,000 kilometers and
a standard deviation of 1,500 kilometers. What is the minimum life span that can be in
the top 20% of life spans? Ans = 81,260

Q15 About 63% of the residents in a town are in favor of building a new high
school. One hundred five residents are randomly selected. What is the
probability that the sample proportion in favor of building a new school is less
than 55%? Ans = 0.0446.