**Student Name: ID:**

**Q1:** A medical research team wishes to assess the usefulness of a certain symptom (call is S) in the diagnosis of a particular disease. In a random sample of 755 patients with the disease. 744 reported having the symptom. In an independent random sample of 1380 subjects without the disease, 21 reported having that they had the symptom.

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| --- | --- | --- | --- |
|  | With Disease (D) | Without Disease ($D^{C}$) | Total |
| Positive (T)  | 744  | 21  | 765  |
| Negative ($T^{C}$)  | 31  | 1359  | 1390  |
| Total  | 775  | 1380  | 2155  |

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| --- | --- |
| **Final****Answer** | **question** |
|  | 1. what is false positive? (A) Probability that result of the test is positive given that patient has disease. (B) Probability that result of the test is negative given that patient has disease. (C) Probability that result of the test is positive given that patient doesn’t have disease. (D) Probability that result of the test is negative given that patient doesn’t have disease. |
|  | 2. Compute the sensitivity of the symptom?  |
|  | 3. Compute the specificity of the symptom?  |
|  | 4. Suppose it is known that the rate of the disease in the general population is .001. What is the predictive value negative of the symptom?  |
|  | 5. What is the predictive value negative of the symptom?  |

**Q2:** For the following probability distribution

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| x  | 0  | 1  | 2  | 3  | 4  | 5  |
| .f(x)  | 0.05  | 0.15  | k  | 0.25  | 0.3  | 0.1  |

|  |  |
| --- | --- |
| **Final****Answer** | **question** |
|  | 6. The value of k is  |
|  | 7. $P(X<3) =$  |
|  | 8. $P( 1\leq X<4) = $ |
|  | 9. Mean of x is  |
|  | 10. Standard deviation of X is  |

**Q3:** The percentage of woman living in border counties along the southern United States with Mexico who have less than a high school education to be 19. Suppose we select three women at random. Use Binomial distribution to find.

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| **Final****Answer** | **question** |
|  | 11. The probability that the number of women with less than a high-school education is zero |
|  | 12. The probability that the number of women with less than a high-school education is two or fewer |
|  | 13. Mean equal |
|  | 14. Standard deviation equal |

**Q4:** In a certain population an average of 13 new cases of a certain disease are diagnosed each year. If the annual incidence of the disease follows a Poisson distribution, find the probability that the number of newly diagnosed cases of the disease will be.

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| **Final****Answer** | **Question** |
|  | 15. Exactly 10 in year  |
|  | 16. Fewer than one in 2 years  |

**Q5:** If the uric acid values in normal adult males are approximately normally distributed with a mean and standard deviation of 5.7 and 1, respectively, for a sample of size 9 find:

|  |  |
| --- | --- |
| **Final****Answer** | **Question** |
|  | 17. The mean of $\overbar{X}$ |
|  | 18. The standard error of $\overbar{X}$ |
|  | 19. The probability that the mean of the uric acid values is greater than 6. |

**Q6:** In a study, the data about the serum cholesterol level in U.S. females are given in the following table:

|  |  |  |  |
| --- | --- | --- | --- |
| **Population**  | **Age**  | **Mean**  | **Standard Deviation**  |
| **A**  | 30 – 59  | 189  | 34.7  |
| **B**  | 20 – 29  | 183  | 37.2  |

Suppose we select a simple random sample of size 50 independently from each population, then:

|  |  |
| --- | --- |
| **Final****Answer** | **Question** |
|  | 20. The distribution of $\overbar{X}\_{1}-\overbar{X}\_{2}$is:  |
|  | 21. The probability that the difference between sample means $\overbar{X}\_{1}-\overbar{X}\_{2}$will be more than 8.  |

**Q7:** Researchers estimated that 64 percent of U.S. adults ages were overweight. Use this estimate as the population proportion for U.S. adults. If 125 subjects are selected at random from the population, what is:

|  |  |
| --- | --- |
| **Final****Answer** | **Question** |
|  | 22. The distribution of $\hat{p}$ |
|  | 23. The probability that 70 percent or more would be found to be overweight?  |

**Q8:** In a study, it is stated that for Americans in the age group 18 to 24 years, 64.8 percent had private health insurance. In the age group 25-34years, the percentage was 72.1. Assume that these percentages are the population parameters in those age groups for the United States. Suppose we select a random sample of 250 Americans from the 18–24 age group and an independent random sample of 200 Americans from the age group 25–34; find:

|  |  |
| --- | --- |
| **Final****Answer** | **Question** |
|  | 24. The distribution of $\hat{p}\_{1}-\hat{p}\_{2}$ |
|  | 25. The probability that $\hat{p}\_{1}-\hat{p}\_{2}$ is less than 6 percent.  |