Q1: Suppose that 45% of the patients visiting a certain clinic are females. If a sample of 35 patients was selected at random, find the probability that:

1. The mean of the sample proportion

(a) 0.0071 **(b) 0.45** (c) 15.75 (d) 0.55

1. The variance of the sample proportion

(a) 0.0071 (b) 0.45 (c) 15.75 (d) 0.55

1. The proportion of females in the sample will be greater than 0.4

 (a) 0.4448 (b) 0.2776 (c) 0.7224 (d) 0.59

1. The proportion of females in the sample will be between 0.4 and 0.5

 (a) 0.4448 (b) 0.2776 (c) 0.7224 (d) 0.59

Q2: In a sample of 20 patients with a certain illness, the mean temperature (in C° ) was 37.Assume that the population is normally distributed with variance 0.24 .

Find a 95% confidence interval for the average temperature.

1. The value of α is

(a) 0.05 (b)0.025 (c) 0.95 (d)0.50

1. The correct formula is

(a) (b) (c) (d)

1. A good point estimate for µ is

(a) 37 (b) 20 (c) 0.49 (d) 0.24

1. The standard error of $\overbar{X}$

(a) 37 (b) 20 (c) 0.1096 (d) 0.24

1. The lower bound is

(a) 34.896 (b) 36.820 (c) 32.706 (d) 36.785

1. The upper bound is

(a) 39.104 (b) 37.180 (c) 39.191 (d) 37.215

Q3. The average life of an industrial machine is 6 years, with a standard deviation of 1 year. Assume the life of such machines follows approximately a normal distribution. A random sample of 4 of such machines is selected. The sample mean life of the machines in the sample is *X*.

(1) The sample mean has a mean equals to:

(A) 5 (B) 6 (C) 7 (D) 8

(2) The sample mean has a variance equals to:

(A) 1 (B) 0.5 (C) 0.25 (D) 0.75

(3) P($\overbar{X}$≤ 5.5)

(A) 0.4602 (B) 0.8413 (C) 0.1587 (D) 0.5398

(4) If P($\overbar{X }$> a) =1492.0, then the numerical value of *a* is:

(A) 0.8508 (B) 1.04 (C) 6.52 (D) 0.2

Q4. Suppose that we are interested in making some statistical inferences about the mean, μ, of a normal population with standard deviation σ=2.0. Suppose that a random sample of size *n*=49 from this population gave a sample mean *X* =4.5.



(1) A good point estimate of μ is

(A) 4.50 (B) 2.00 (C) 2.50 (D) 7.00



(2) The standard error of *X* is

(A) 0.0816 (B) 2.0 (C) 0.0408 (D) 0.5714 (E) 0.2857

(4) A 95% confidence interval for μ is

(A) (3.44,5.56) (B) (3.34,5.66) (C) (3.54,5.46) (D) (3.94,5.06) (E) (3.04,5.96)

Q5. A researcher was interested in comparing the mean score of female students, μf, with the mean score of male students, μm, in a certain test. Two independent samples gave the following results:

|  |  |
| --- | --- |
| sample | obsevations |
| Female scores | 89.2 | 81.6 | 79.6 | 80 | 82.8 |  |
| Male scores | 83.2 | 84.8 | 83.2 | 81.4 | 78.6 | 71.5 | 77.6 |

 

Assume the populations are normal with equal variances. (1) The pooled estimate of the variance S2p is

(A) 17.994 (B) 17.794 (C) 18.094 (D) 18.294

(E) 18.494

(2) A point estimate of μf − μm is

(A) 2.63 (B) −2.59 (C) 2.59 (d) 0.59 (E) −1.57 (f) 7.55

(3) The lower limit of a 90% confidence interval for μf − μm

(A) −1.97 (B) −1.67 (C) 1.97

(4) The upper limit of a 90% confidence interval for μf − μm

(A) 6.95 (B) 7.15 (C) −7.55

Q6. In a study involved 1200 car drivers, it was found that 50 car drivers do not use seat belt.

(1) A point estimate for the proportion of car drivers who do not use seat belt is:

(A)50 (B)0.0417 (C)0.9583 (D)1150 (E)Noneofthese

(2) The lower limit of a 95% confidence interval of the proportion of car drivers not using seat belt is

(A) 0.0322 (B) 0.0416 (C) 0 .0304 (D) –0.3500 (E) None of these

(3) The upper limit of a 95% confidence interval of the proportion of car drivers not using seat belt is

(A) 0.0417 (B) 0.0530 (C) 0.0512 (D) 0.4333 (E) None of these

Q7. Suppose that we are interested in making some statistical inferences about the mean, μ, of a normal population with standard deviation σ=2.0. Suppose that a random sample of size *n*=49 from this population gave a sample mean *X* = 4.5 .

(1) If we want to test Ho:μ=5.0 against H1:μ≠5.0, then the test statistic equals to

(A) Z= −1.75 (B) Z=1.75 (C) T= −1.70 (D) T= 1.70

(E) Z= −1.65

(2) If we want to test Ho: μ ≤ 5.0 against H1: μ>5.0 at α=0.05, then the Rejection Region of Ho is

(A) (1.96,∞) (B) (2.325,∞) (C) (−∞,−1.645) (D) (−∞,−1.96 )

(E) (1.645, ∞)

(3) If we want to test Ho: μ ≤ 5.0 against H1: μ>5.0 at α=0.05, then we (A) Accept Ho (B) Reject Ho

Q8. A researcher was interested in comparing the mean score of female students, μf, with the mean score of male students, μm, in a certain test. Two independent samples gave the following results:

|  |  |
| --- | --- |
| sample | obsevations |
| Female scores | 89.2 | 81.6 | 79.6 | 80 | 82.8 |  |
| Male scores | 83.2 | 84.8 | 83.2 | 81.4 | 78.6 | 71.5 | 77.6 |

Assume that the populations are normal with equal variances. (1) The pooled estimate of the variance S2p is

(A) 17.994 (B) 17.794 (C) 18.094 (D) 18.294 (E) 18.494

(2) If we want to test Ho: μf = μm against H1: μf ≠ μm then the test statistic equals to

(A) Z= 1.129 (B) T= −1.029 (C) T=1.029 (D) T=1.329

(E) T= −1.329

(3) If we want to test Ho: μf = μm against H1: μf ≠ μm at α=0.1, then the Acceptance Region of Ho is

(A) (−∞,1.812) (B) (−1.812,1.812) (C) (−1.372,∞)

(D) (−1.372,1.372) (E) (−1.812,∞)

(4)IfwewanttotestHo:μf =μm againstH1:μf ≠μm atα=0.1,then we

(A) Reject Ho (B) Accept Ho

Q9. A researcher was interested in making some statistical inferences about the proportion of smokers (*p*) among the students of a certain university. A random sample of 500 students showed that 150 students smoke.

(1) If we want to test Ho: *p*=0.25 against H1:*p*≠0.25 then the test statistic equals to

(A) z=2.2398 (B) T=−2.2398 (C) z=−2.4398 (D) Z=2.582

(E) T=2.2398

 (2) If we want to test Ho: *p*=0.25 against H1:*p*≠0.25 at α=0.1, then the Acceptance Region of Ho is

(A) (−1.645,∞) (B) (−∞,1.645) (C) (−1.645,1.645)

(D) (−1.285,∞) (E) (−1.285,1.285)

(3) If we want to test Ho: *p*=0.25 against H1:*p*≠0.25 at α=0.1, then we

(A) Accept Ho (B) Reject Ho

Good Luck