Department of Statistics & Operations Research

College of Science

King Saud University

STAT – 145: Biostatistics

Final Examination

Summer Semester 1436 – 1437

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| --- | --- | --- |
| Student's Name |  | |
| Student's Number |  | |
| Section's Number |  | Serial Number **:** |
| Teacher's Name |  | |

Instructions:

* There are 40 multiple choice questions.
* Time allowed is 180 minutes. (2 *Hours*).
* For each question, put the code of the correct answer in the following table beneath the question number. Please, use capital letters: A, B, C, and D.
* Do not copy answers from your neighbors; they have different question forms.
* Mobile Telephones are **not allowed** in the classroom.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| B | A | D | B | B | D | C | D | A | D |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| A | B | A | D | B | C | B | D | C | A |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| B | C | B | D | B | A | B | C | B | A |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| C | A | D | B | C | C | B | A | D | A |

Good luck

* Suppose that the hemoglobin levels (in g/dl) of healthy Saudi females are approximately normally distributed with mean of 13.5 and a standard deviation of 0.7. If 15 healthy adult Saudi female is randomly chosen, then:

1. **The mean of**  **(****or** **) is:**
2. 0.7 (B) 13.5 (C) 15 (D) 3.48
3. **The standard error of**  **() is:**

(A) 0.181 (B) .0327 (C) 0.7 (D) 13.5

1. ****

(A) 0.99720 (B) 0.99440 (C) 0.76115 (D) 0.9971

1. ****

(A) 0.99 (B) 0.50 (C) 0.761 (D) 0.622

1. 

(A) 0.9972 (B) 0.9942 (C) 0.7615 (D) 0.5231

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* If the hemoglobin level of pregnant women (امرأه حامل) is normally distributed, and if the mean and standard deviation of a sample of 25 pregnant women were ­­(g/dl), (g/dl).Using, to test if the average hemoglobin level for the pregnant women is greater than 10 (g/dl) [H0 : μ≤10 , HA: μ>10].

1. **The test statistic is:**

(A)(B) (C)(D)

1. **The value of the test statistic is:**

(A) 10 (B) 1.5 (C)7.5 (D)37.5

1. **The rejection of H0 is :**

(A) z< -1.645 (B) z> 1.645 (C) t < -1.7109 (D) t > 1.71099

1. **The decision is:**

(A) Reject B) Do not reject (Accept) 

(C) Accept both  and (D) Reject both  and 

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* A sample of 16 college students were asked about time they spent doing their homework. It was found that the average to be 4.5 hours. Assuming normal population with standard deviation 0.5 hours.

1. **The point estimate for**  **is:**

(A) 0 hours (B) 10 hours (C)0.5 hours (D) 4.5 hours

1. **The standard error of****is:**

(A) 0.125 hours (B) 0.266 hours (C) 0.206 hours (D) 0.245hours

1. **The correct formula for calculating** **confidence interval for µ is:**

(A) (B) 

(C) (D) 

1. **The upper limit of 95% confidence interval for µ is:**

(A) 4.745 (B) 4.531 (C) 4.832 (D) 4.891

1. **The lower limit of 95% confidence interval for µ is:**

(A) 5.531 (B) 7.469 (C) 3.632 (D) 4.255

1. **The length of the 95% confidence interval for µ is:**

(A) 4.74 (B) 0.49 (C) 0.83 (D) 0.89

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* A researcher was interested in comparing the mean score of female students, with the mean score of male students  in a certain test. Assume the populations of score are normal with equal variances. Two independent samples gave the following results:

|  |  |  |
| --- | --- | --- |
|  | Female | male |
| Sample size |  |  |
| Mean |  |  |
| Variance |  |  |

1. **The point estimate of**  **is:**

(A) 2.63 (B) -2.37 (C) 2.59 (D) 0.59

1. **The estimate of the pooled variance (****) is:**

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

1. **The upper limit of the 95% confidence interval for**  **is :**

**(A)** 26.717 (B) 7.525 (C) 7.153 (D) 8.2

1. **The lower limit of the 95% confidence interval for**  **is :**

**(A)** -21.54 (B) - 2.345 (C) - 3.02 (D) -1.973

* **In the same question, test at level α = 0.05 the doubt that** **and** **are different, then**

1. **The hypotheses are :**

(A) Ho:  (B) Ho: (C)Ho:< (D)Ho:≤

HA:HA:< HA:>HA:>

1. **The value of the test statistic is:**

(A) 1.3 (B)1.029 (C) 0.46 (D) 0.93

1. **The acceptance region (AR) of H0 is:**

(A)  (B) 

(C) (-2.2281, 2.2281) (D) (-1.96, 1.96)

1. **The decision is:**

(A) Reject B) Do not reject (Accept) 

(C) Accept both  and  (D) Reject both  and 

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* A standardized chemistry test was given to  girls and  boys. The girls made an average of , while the boys made an average grade of . Assume the population standard deviations are  and  for girls and boys respectively. To test the null hypothesis  against the alternative hypothesis  at  level of significance:

1. **The standard error of** 

(A) 0.2266 (B) 2 (C) 1.5733 (D) 1.2543

1. **The value of the test statistic is:**

(A) -1.59 (B) 1.59 (C) 1.25 (D) 4.21

1. **The rejection region (RR) of H0 is:**

(A)  (B) 

(C)  (D) 

1. **The decision is:**

(A) Reject B) Do not reject (Accept) 

(C) Accept both  and  (D) Reject both  and 

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* Toothpaste (معجون الأسنان) company claims thatmorethan75% of the dentists recommend their product to the patients. Suppose that 161 out of 200 dental patients reported receiving a recommendation for this toothpaste from their dentist. Do you suspect that the proportion is actually morethan75%. If we use 0.05 level of significance to test , , then:

1. **The sample proportion**  **is:**

(A) 0.75 (B) 0.195 (C) 0.805 (D) 0.25

1. **The value of the test statistic is:**
2. 1.963 (B) 1.796 (C) -1.796 (D) -1.963
3. **The decision is:**

(A) Reject H0 (B) Do not reject (Accept) 

(C) Accept both  and  (D) Reject both  and 

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* A researchers group has perfected a new treatment of a disease which they claim is very efficient. As evidence, they say that they have used the new treatment on 50 patients with the disease and cured 25 of them. To find 95% confidence interval for the proportion of the cured.

1. **The point estimate of *p* is equal to:**

(A) 0.25 (B) 0.01 (C) 0.5 (D) 0.33

1. **The reliability coefficient (****) is:**

(A) 1.96 (B) 1.645 (C) 2.02 (D) 1.35

1. **The 95% confidence interval is equal to:**

(A) (0.1114, 0.3886) (B) (0.3837, 0.6163)

(C) (0.1614, 0.6386) (D) (0.3614, 0.6386)

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* In a study, it was found that 31% of the adult population in a certain city has a diabetic disease. 100 people are randomly sampled from the population. Then

1. **The mean for the sample proportion (**) is:

(D) 0.1 (C) 0.69 (B) 0.31 (A) 0.4

1. 

(A) 0.02619 (B) 0.02442 (C) 0.0256 (D) 0.7054

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* In a first sample of 100 store customers, 43 used a MasterCard. In a second sample of 100 store customers, 58 used a Visa card. To find the 95% confidence interval for difference in the proportion () of people who use each type of credit card?

1. **The value of α is :**

(A) 0.95 (B) 0.5 (C) 0.05 (D) 0.025

1. **The upper limit of 95% confidence interval for the proportion difference is:**

(A) 0.137 (B) -0.013 (C) 0.518 (D) 0.150

1. **The lower limit of 95% confidence interval for the proportion difference is:**

(A) – 0.278 (B) 1.547 (C) 0.421 (D) -0.129

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* In a first sample of 200 men, 130 said they used seat belts and a second sample of 300 women, 150 said they used seat belts. To test the claim that men are more safety-conscious than women (), at 0.05 level of significant:

1. **The value of the test statistic is:**
2. -3.31 (B)5.96 (C)1.15 (D) 3.31
3. **The decision is:**

**(**A) Reject B) Do not reject (Accept) 

(C) Accept both  and  (D) Reject both  and 

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End of the questions