Engineering Mathematics-III

Total points 7/20

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0 of 2 points

✗ Q 1 * 0/2

Following figures represent the running period of flicks manufactured by two movie companies.

Company Period (hours)

A	103	94	110	87	98		
B	97	82	123	92	175	88	181

Calculate a 90% confidence interval for the difference between the average running periods of flicks manufactured by the two companies. Assume that the running-period differences are approximately normally distributed with unequal variances.

- ○ -36.5 < μ 1 - μ 2 < 11.9
- ○ -61.21 < μ 1 - μ 2 < 18.61
- ○ -52.9947 < μ 1 - μ 2 <10.3947
- ◉ -72.56 < μ 1 - μ 2 < 29.96 ✗

Q 2 2 of 2 points

✓ Solve * 2/2

A random sample of 350 voters in a certain city is asked if they favor an additional 5% property tax to deliver revenues for infrastructure. If more than 210 but fewer than 250 favor the sales tax, we shall conclude that 65% of the voters are for it. What is the probability of (a) committing a type I error if 65% of the voters give courtesy to the increased tax. (b) Committing a type II error using this test procedure if actually only 58% of the voters are in favor of the additional property tax?

- ○ α =0.1036, β = 0.0016
- ◉ α= 0.0349, β= 0.2236 ✓
- ○ α =0.0466, β = 0
- ○ α =0.1379, β =0.209

Q 3 0 of 2 points

✗ Solve * 0/2

A industrialist has established a new net, which the industry guarantees has a mean breaking strength of 14 kg with a standard deviation of 0.6 kg. To test the hypothesis that $\mu = 14$ kg against the alternative that $\mu < 14$ kg, a random sample of 40 nets will be tested. The critical region is defined to be $x < 13.9$. (a) Find the probability of committing a type I error when H_0 is true. (b) Evaluate β for the alternatives $\mu = 13.7$ kg.

- ○ 0.1056, 0.1056
- ○ 0.1056, 0.0062
- ○ 0.119, 0.0094
- ◉ 0.119, 0.881 ✗

Q 4 2 of 2 points

✓ Solve * 2/2

The mean height of sport women in the certain sport academy has factually been 162.5 cms with a S.D. of 6.9 cms. Is there motivation to accept that there has been a change in the mean height if a random sample of 50 sport women in the current batch has a mean height of 165 cms? What is a *P*-value in your conclusion for 0.05 level of significance? Assume the S.D. doesn't change.

- ○ 0.0022, reject null hypothesis
- ◉ 0.0104, reject the null hypothesis ✓
- ○ 0.001, reject null hypothesis
- ○ 0.1236, accepted the null hypothesis

Q 5 0 of 2 points

✗ Solve * 0/2

A random sample of size 25, taken from a normal population with a S.D. 5.2, has a mean 81. A second random sample of size 36, taken from a different normal population with a S.D. 4.3, has a mean 78. Test the hypothesis that $\mu 1 = \mu 2$ against the alternative, $\mu 1 \neq \mu 2$. Quote a *P*-value in your conclusion.

- ◉ 0.007, reject the null hypothesis ✗
- ○ 0.0016, reject null hypothesis
- ○ 0.1031, accept the null hypothesis
- ○ 0.017, reject null hypothesis

Q 6 0 of 2 points

✗ Solve * 0/2

The survey was made to decide whether the topic in a material science course is better perceived when a lab comprises part of the course. Understudies were arbitrarily chosen to take an interest in either a 3-semester hour course without labs or a 4-semester-hour course with labs. In the section with labs, 11 students made a mean grade of 86 with a S.D. of 4.7, and in the section without labs, 17 students made a mean grade of 79 with a S.D. of 6.1. Would you say that the lab course increases the mean grade by as much as 8 points? Use a *P*-value for 0.05 level of significance in your conclusion assuming the populations to be roughly normally distributed with equal variances.

- ○ 0.1825, the laboratory course increases the mean grade
- ○ 0.0016, the laboratory course doesn't increase the mean grade
- ◉ 0.0379, the laboratory course doesn't increase the mean grade ✗
- ○ 0.8967, the laboratory course increases the mean grade

Q 7 0 of 1 points

✗ Solve * 0/1

A random sample of 100 people to a temple in Orissa spent an average of Rs.142 on the visit with a standard deviation of Rs. 47.5. Which of the following would the 98% confidence interval for the mean money spent by all travelers to this temple?

- ○ (134.81, 154.21)
- ○ (145.21, 160.31)
- ◉ (129.97, 158.65) ✗
- ○ (133.77, 153.23)

Q 8 1 of 1 points

✓ Solve * 1/1

An industrial designer wants to determine the average amount of time it takes an adult to assemble an "easy to assemble" toy. A sample of 16 times yielded an average time of 19.92 minutes, with a sample standard deviation of 5.73 minutes. Assuming normality of assembly times, provide a 95% confidence interval for the mean assembly time.

- (16.87, 22.97) ✓
- (15.2, 24.68)
- (14.35, 23.56)
- (16.25, 21.89)

Q 9 0 of 2 points

✗ Solve * 0/2

A type of fiber is being calculated for its workable strength properties. 50 pieces were tested under similar conditions, and the results showed an average workable strength of 78.3 kilograms and a standard deviation of 5.9 kilograms. Assuming a normal distribution of workable strengths, give a lower 95% confidence limit on a single observed workable strength value.

- 68.815 ✗
- 76.9
- 77.6728
- 85.7584

Q 10 2 of 2 points

✓ Solve * 2/2

The following measurements were recorded for the dehydrating time, in hours, of a certain brand of oil paint:

3.4	2.5	4.8	2.9	3.6
2.8	3.3	5.6	3.7	2.8
4.4	4.0	5.2	3.0	4.8

Assuming that the measurements represent a random sample from a normal population, find a 99% confidence interval for the dehydrating time for the next trial of the paint. Assume $\sigma = 1$.

- 3.0544 < μ < 4.5456
- 3.28 < μ < 4.3
- 3.2628 < μ < 4.3372
- 3.13 < μ < 4.47 ✓

Q 11 0 of 2 points

✗ Solve * 0/2

Two catalysts in a batch chemical process are being compared for their effect on the output of the process reaction. A sample of 12 batches was prepared using catalyst 1, and a sample of 10 batches was prepared using catalyst 2. The 12 batches for which catalyst 1 was used in the reaction gave an average yield of 85 with a sample standard deviation of 4, and the 10 batches for which catalyst 2 was used gave an average yield of 80 and a sample standard deviation of 6.

What would be a 95% confidence interval for the difference between the population means, assuming that the populations are approximately normally distributed with equal variances?

- 1.3076 < μ 1 - μ 2 < 8.6924
- 0< μ 1 - μ 2 <8
- 0.535 < μ 1 - μ 2 < 9.465
- 0.692< μ 1 - μ 2 < 7.307 ✗

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