ENGG 319 Quiz 5

Circle the nearest answers.

Q#1. A data set of 60 metal cylinder diameters has mean 5 mm, and standard deviation 0.134 mm. Which of the following represent a 90% confidence interval for the mean diameter in mm? Choose the best answer.

(a) (4.97, 5.03)
(b) (4.97, 5.07)
(c) (4.90, 5.07)
(d) (4.90, 5.01)
(e) (4.90, 5.1)

Q#2. A survey of 1250 voters shows that only 98 of them will vote for a candidate 'A'. If the total number of voters are 5000,000, infer with 99% confidence the actual number of voters who will vote for candidate 'A'. Choose the best answer.

a) Between 300,000 and 500,000
b) Between 300,000 and 450,000
c) Between 300,000 and 400,000
d) Between 400,000 and 500,000
e) Between 400,000 and 450,000

Q#3. Calculate the probability of type I error if the acceptance region in a hypothesis test is determined to be $z \leq 1.645$ assuming the null hypothesis is true. The alternative hypothesis was 'the mean value was greater than 200', and z has standard normal distribution.

(a) 0.05
(b) 0.95
(c) 0.025
(d) 0.01
(e) 0.02

Q#4. Consider the following hypothesis test at 0.05 level of significance.

H_0: $\mu = 3$
H_1: $\mu \neq 3$

The sample mean is 2.15 for sample size, n =11,160. Assume population standard deviation is 1.05. Consider the following statements.

(1) The critical region includes $z > 1.96$ and $z <- 1.96$
(2) The conclusion of the test is 'Reject H_0'
(3) The conclusion of the test is 'Do not reject H_0'

Which of the above statement/statements is/are true?

(a) (1) only
(b) (3) only
(c) (1) and (2)
(d) (1) and (3)
(e) (2) only

Q#5. An engineer wants to determine whether the mean response time of a drug differs from the control mean response time of $\mu = 1.2$ seconds. Suppose the sample mean is found to be 1.05 seconds for a sample size of 100. Assume population variance is 25 second^2. Calculate the P-value.

(a) 0.76
(b) 0.005
(c) 0.001
(d) 0.05
(e) 0.0026

Q#6. An engineer wants to determine whether the mean response time of a drug differs from the control mean response time of $\mu = 1.2$ seconds at the 1% level of significance. Suppose population variance is 0.025 second^2, and the true mean response time is 1.1 seconds. Calculate sample size required if power of the test is to be 0.90.
a) 38
b) 45
c) 100
d) 60
e) 28