Class Test 16th April 2024

Max Marks: 20 **Time: 40 minutes**

The body temperature of students suffering from statisticsphobia is being studied. From previous experience yield is known to be normally distributed with standard deviation 3. Ten students selected at random and the mean temperatures (in Fahrenheit) is 90.48.

a. What are the possible alternative hypotheses to validate the statement that the average temperature of such students is 90?
b. How would you find a 95% two-sided confidence interval on the true mean yield in the above cases?
c. How would you find the critical value of temperature z.?
d. Clearly mark the acceptance region and the rejection region for the cases developed in (a).
e. Using (a), (b) and (c) explain how would you decide to accept your null hypothesis or reject the null hypothesis.
f. Explain using an appropriate diagram what happens if the level of significance α is increased.
g. How would you calculate the power of the test if the average temperature of such students is 91?
h. Give a proper explanation as to how the power of the test is affected if the size of the sample increases.
i. In case the standard deviation is not known, how will you modify your test?

(3 + 3 + 1 + 3 + 2 + 2 + 2 + 2+ 2 = 20 marks)