E

Name Key

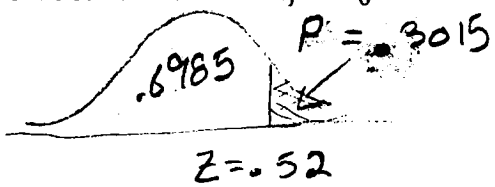
Date ___/___/___

1, 4 (10 pts each)
2, 3, 5-7 (16 pts each)

Illowsky – Chapt. 9 & 10
Larson – Chapt. 7 & 8

All tests are rejection region tests, unless otherwise indicated.
Provide an appropriate response.

1) Find the P-value for the hypothesis test with the standardized test statistic z. Decide whether to reject H_0 for the level of significance α.



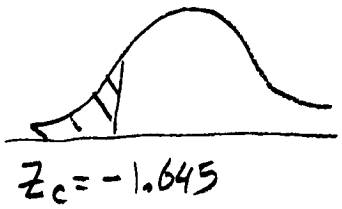
Right-tailed test
z = 0.52
α = 0.05

A) 0.6030; Fail to reject H_0
B) 0.0195; Reject H_0
C) 0.3015; Fail to reject H_0
D) 0.3015; Reject H_0

$Z = .52 \Rightarrow$ Area To left $= .6985 \Rightarrow$ Area To right, $P = .3015$
Since $P > \alpha \Rightarrow$ FTR H_0

2) A fast food outlet claims that the mean waiting time in line is less than 3.8 minutes. A random sample of 60 customers has a mean of 3.7 minutes with a population standard deviation of 0.6 minute. If $\alpha = 0.05$, test the fast food outlet's claim.

H_0: $\mu \geq 3.8$
H_a: $\mu < 3.8$ Claim



$$Z^* = \frac{3.7 - 3.8}{\frac{.6}{\sqrt{60}}} = -1.29$$

$n > 60$
$\bar{x} = 3.7$
$\sigma = .6$
$\alpha = .05$

D: FTR H_0

C: At a 5% LOS, There is NOT enough evidence to support The claim That The mean waiting Time is less Than 3.8 min.

3) The Metropolitan Bus Company claims that the mean waiting time for a bus during rush hour is less than 5 minutes. A random sample of 20 waiting times has a mean of 3.7 minutes with a standard deviation of 2.1 minutes. At $\alpha = 0.01$, test the bus company's claim. Assume the distribution is normally distributed.

H_0: $\mu \geq 5$
H_a: $\mu < 5$ (Claim)
$n = 20 \Rightarrow$ d.f. $= 19$
$\bar{x} = 3.7$
$s = 2.1$
$\alpha = .01$

$t^* = -2.77$

D: Reject H_0

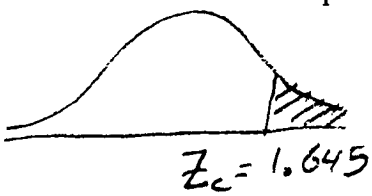
C: At a 1% LOS, There is enough evidence To Support The claim That The mean waiting Time for a bus during rush hour is less Than 5 min.

4) Classify the two given samples as independent or dependent.

Sample 1: Pre-training weights of 18 people
Sample 2: Post-training weights of the same 18 people

5) A medical researcher suspects that the pulse rate of smokers is higher than the pulse rate of non-smokers. Test the researcher's suspicion using $\alpha = 0.05$. Assume the two samples are random and independent.

Smokers	Nonsmokers
$n_1 = 100$	$n_2 = 100$
$\bar{x}_1 = 87$	$\bar{x}_2 = 84$
$\sigma_1 = 4.8$	$\sigma_2 = 5.3$



$H_0: P_1 \leq P_2$

$H_a: P_1 > P_2$ (claim)

$\alpha = .05$

$Z^* = 4.195$

D: Reject H_0

C: At a 5% LOS, there is enough evidence to support the claim that the pulse rate for smokers is higher than the pulse rate of non-smokers.

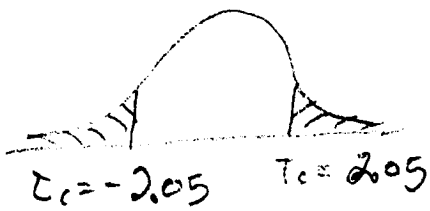
6) A study was conducted to determine if the salaries of elementary school teachers from two neighboring districts were equal. A sample of 15 teachers from each district was randomly selected. The mean from the first district was \$28,900 with a standard deviation of \$2300. The mean from the second district was \$30,300 with a standard deviation of \$2100. Test the claim that the salaries from both districts are equal. Assume the samples are random and independent, and the populations are normally distributed. Also, assume that $\sigma_1^2 = \sigma_2^2$. Use $\alpha = 0.05$.

$\alpha = .05$, d.f. = 28 (Pooled)

$H_0: \mu_1 = \mu_2$ (claim)

$H_a: \mu_1 \neq \mu_2$

DIST-1	DIST-2
$n_1 = 15$	$n_2 = 15$
$\bar{x}_1 = 28900$	$\bar{x}_2 = 30300$
$s_1 = 2300$	$s_2 = 2100$



$T^* = -1.74$

D: FTR H_0

C: At a 5% LOS, there is not enough evidence to reject the claim that the salaries are the same.

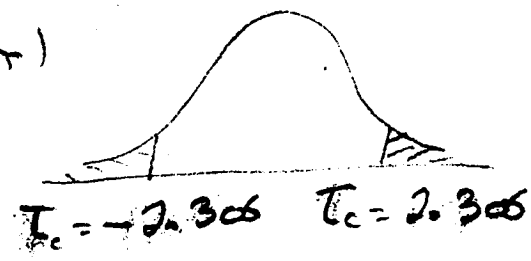
7) Nine students took the SAT. Their scores are listed below. Later on, they took a test preparation course and retook the SAT. Their new scores are listed below. Test the claim that the test preparation had no effect on their scores. Assume the samples are random and dependent, and the populations are normally distributed. Use $\alpha = 0.05$.

Student	1	2	3	4	5	6	7	8	9
Scores before course	720	860	850	880	860	710	850	1200	950
Scores after course	740	860	840	920	890	720	840	1240	970

$H_0: \mu_d = 0$ (claim)

$H_a: \mu_d \neq 0$

$\alpha = .05$



$T^* = \dfrac{-15.556 - 0}{\dfrac{19.437}{\sqrt{9}}} = -2.40$

D: Reject H_0

C: At a 5% LOS, there is enough evidence to reject the claim that test preparation had no effect on their scores.