EPPS 2302 : QUIZ #3

To get full credit for your answer, you must show your work. Use the space provided on this sheet to show your work.

Problem 1(20pt)

1 Determine the critical value to test the claim about the population proportion $\mu_{\hat{p}} > 0.250$ given n =48 and $\hat{p} = 0.231$

$Z_{crit} = 1.645$

2 Determine the test score to test the claim about the population proportion $\mu_{\hat{p}} > 0.132$ given n = 48 and $\hat{p} = 0.11$.

Z = $\frac{0.11-0.132}{\sqrt{\frac{0.132(1-0.132)}{48}}}$ = -0.45

Problem 2(20pt)

The maximum speed of Addison's car was 150 mph on average.
The car had broken down in the last week. An auto mechanic repaired it.
She did test driving for 5 times. The result is that mean : 148 mph and s.d. : 7.
Addison argues the car is slower than before. Test it. $\alpha = 0.05$
You should show : correct H1, Test score, Critical value, Decision,and Interpretation.

H1 : $\mu < 150$.
Test score : t = $\frac{148-150}{\frac{7}{\sqrt{5}}}$ = -0.64.
Critical value : -2.132 . DF : 4
Decision $|-0.64| < |-2.132|$ Fail to reject H0.
Interpretation : There is insufficient evidence at the $\alpha = 0.05$ level of significance to conclude that the car is slower than before.

Problem 3(20pt)

Find the test score to test the hypothesis that $\mu_1 = \mu_2$. Assume the variances are not equal
$n_1 = 40$, $n_2 = 35$
$\bar{x_1} = 18$, $\bar{x_2} = 19$
$s_1 = 2.5$, $s_2 = 2.8$

Z = $\frac{18-19}{\sqrt{\frac{2.5^2}{40}+\frac{2.8^2}{35}}}$ = -1.6

Problem 4(40pt)

1 Fill the two blanks in the Stata outcome

```
ttest mpg1==mpg2, unpaired

Two-sample t test with equal variances
------------------------------------------------------------------------------
Variable |     Obs        Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
---------+--------------------------------------------------------------------
    mpg1 |       8       20.75    1.064861    3.011881      18.232      23.268
    mpg2 |       8       22.25    1.278252    3.615443    19.22741    25.27259
---------+--------------------------------------------------------------------
combined |      16        21.5    .8266398    3.306559    19.73806    23.26194
---------+--------------------------------------------------------------------
    diff |               -1.5    (??       )             -5.068255    2.068255
------------------------------------------------------------------------------
    diff = mean(mpg1) - mean(mpg2)                                t =  -0.9016
Ho: diff = 0                                     degrees of freedom =(??      )
```

This is a test for two samples with small sample size and equal variances.
Std.Err. $= \sqrt{11 * \frac{2}{8}} = 1.66$, s.t. $S_p^2 = \frac{7*3.01^2+7*3.62^2}{14} = 11$
DF : 8+8-2 = 14

2 We cannot find the p-value in the STATA outcome.
Find the critical value for the two-tail test and show your decision for the test.

Critical value : |2.145|, DF : 14
$|-0.9| < |2.145|$, Fail to reject H0.