Econometrics

Econ 3341 - 01: Mock Exam 1

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Name: _____

Total Points: 22 (plus 2 extra points) *Show your work*

1. In order to analyze the effect of inflation on unemployment, we consider four observations of these variables from U.S. data. Let X_i be the inflation rate and let Y_i be the rate of unemployment. *(total 14 points)*

Y	***X***						
6.7	3.2						
8.3	2.4						
7.6	2.8						
5.4	3.4						

Note: Make sure you have to show your calculations here.

$$b_2 = \frac{\sum_{i=1}^{4}(X_i - \overline{X})(Y_i - \overline{Y})}{\sum_{i=1}^{4}(X_i - \overline{X})^2} \qquad b_1 = \overline{Y} - b_2\overline{X}$$

   a. Use the OLS formulas and fill out the table above to calculate the estimated coefficients b_1 and b_2. *(3 points)*

   b. Write down the estimated regression equation. *(2 points)*

c. Draw a scatter plot with the fitted regression line making sure you label the axes. *(2 points)*

d. What is the interpretation of the intercept? *(2 points)*

e. What is the interpretation of the slope coefficient? *(2 points)*

f. In the last column of the table calculate the fitted or predicted values. What is the residual for the third observation in the sample? *(3 points)*

2. The following Excel output comes from a sample of 807 individuals. The idea is to evaluate the effect of education (measured in years of schooling) on cigarettes, measure by the *logarithm* of the number of cigarettes smoked per day. *(total 8 points + 2 extra points)*

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.0487
R Square	0.0824
Adjusted R Square	0.0011
Standard Error	13.7137
Observations	807

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	359.82	359.817	1.913	0.167
Residual	805	151393.87	188.067		
Total	806	151753.68			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	1.412	2.029	5.625	0.000	0.743	2.139
Education	-0.051	0.158	-1.383	0.167	-0.032	-0.070

a. Write down the estimated equation. *(2 points)*

b. What is the interpretation of the slope coefficient? *(2 points)*

c. How good is this regression equation in explaining the variation in the number of cigarettes smoked per day? Use the R-squared to answer this question. *(2 points)*

d. What is the 95% confidence interval for the intercept? (*2 points*)

e. What is the predicted number of cigarettes smoked *per week* for an individual who has ten years of schooling? *(2 extra points)*