**AAEC6580** Fall 2018 Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Exam 1: Prof. Craig Landry

**Instructions:** Answer *all questions* in the space provided. Be sure to show your work and draw graphs where appropriate. Points for each question are indicated. Allocate your time appropriately. Good luck.

1. Let *u* represent a consumer’s utility, and let the prices of two consumption goods be represented by *p1*, *p2* > 0. Consider the following function: *E*(*p1,p2,u*) = α*p1*-1*p2*2*u*-β. Evaluate whether that this is a valid *Expenditure Function* by checking that it is increasing in *P* and *u*, concave in *P*, and homogeneous of degree one in *P*. (15 points)

2a. Write down the budget identity for a complete Marshallian demand system with two commodities (*x*1 and *x*2, with income level *m*). (5 points)

2b. Derive the *Engel Aggregation*. (10 points)

2c. Let m=$100, *p*1=$10, *p*2=$1, *x*1=5, *x*2=50, and the income elasticity for good 1, η1= =0.5. Using this information, find the income elasticity for good 2 (η2). (10 points)

3a. Let a consumer’s preference relation be represented by the function u = x13/5x24/5. Set up and solve this consumer Utility Maximization problem. Find the arguments that optimize the function and the optimal value function. List and ***demonstrate*** 4 of the properties of this optimal value function. (25 points)

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3b. Find the expenditure function (that indicates the minimal amount of income necessary to attain a given level of utility) and *Hicksian* demand for x1. (10 points)

4. In commodity space (quantity of goods on the axes), use comparative statics to indicate the total effect, substitution effect, and income effect for a price increase of a *Giffen* good. Use your price effect decomposition to indicate the difference between *Hicksian* or *Marshallian* demand. (25 points)

**BONUS:** Discuss how you would use an incomplete demand system to study a problem that you are personally interested in (focusing on agriculture, food, development, environmental, or natural resource economics). (10 points)