UNIVERSITY OF COLOMBO

FACULTY OF ARTS

FOURTH YEAR EXAMINATION IN ARTS (ECONOMICS) 2016/2017

END OF THE SECOND SEMESTER

ECN: 4274 – ECONOMETRIC APPLICATIONS

ANSWER ANY THREE (03) QUESTIONS ONLY

TIME ALLOWED: TWO (02) HOURS

1.

a. Discuss the problems a researcher may encounter when he/she employs Ordinary Least Square (OLS) estimator to estimate following model?

$Y_i = \beta_1 + \beta_2 X_i + u_i$

where Y takes the value of 1 or 0

(05 Marks)

b. Derive Logit model for the part (a)

(10 Marks)

c. Explain, briefly, how does the Logit Model rectify some of those issues identified under the part (a)

(05 Marks)

2. A researcher estimated a Logit Model to examine the effect of parental migration on children education. Data were collected from migrant and non-migrant households in three districts in Sri Lanka. The dependent variable is self-assessment on performance in tests at school. The dependent variable takes 1 if he/she views her exam performance is average or above the peers, and zero, otherwise. The estimated results are reported below.

Table 1: Impact of Parental Migration on Children's Education

Dependent Variable: Self-Assessment on Performance in Tests at School (*1=Average or Above; 0=Below Average*)

	Model (1)	*Model (2)*
Constant	-0.149	-0.097
	(0.427)	(0.430)
Housework engagement (number of tasks involved)	-0.117**	-0.109**
	(0.048)	(0.048)
After school activities (1= engaged mostly in education activities; 0=otherwise)	0.612***	0.600***
	(0.195)	(0.196)
Number of siblings	0.188**	0.174**
	(0.086)	(0.086)
Education of head of household (1=secondary and above, 0=less than secondary)	0.049	0.042
	(0.079)	(0.088)
Migration status (1=migrant household, 0=non-migrant household)	0.243	0.243
	(0.268)	(0.270)
Mother migrant household (1= mother migrant household, 0=otherwise)	-0.773***	-0.839***
	(0.219)	(0.236)
Distance to school (in KM)	0.082**	0.085**
	(0.039)	(0.039)
District effects		No
Log likelihood value	-321.46	-322.08
No of observations	509	509
Pseudo R^2	0.070	0.68

Note: Standard errors are reported in parentheses while ** and *** indicate that the estimated coefficients are statistically significant at 5 per cent and 1 per cent respectively.

(a) While providing theoretical underpinnings, discuss the estimated results.

(07Marks)

(b) Discuss possible econometric issues that the model may suffer.

(04 Marks)

(c) Estimate the probability of self-assessment to be average or above
   a. if a student travel 30 KM to his/her school
   b. if there are 3 siblings
   c. if no of housework is five
   (hint: assume mean is zero for all other variables, except the one you are interested in)

(09 Marks)

3.

(a) Discuss at least four occasions in which a researcher may employ a Multinomial Logit Model.

(02 Marks)

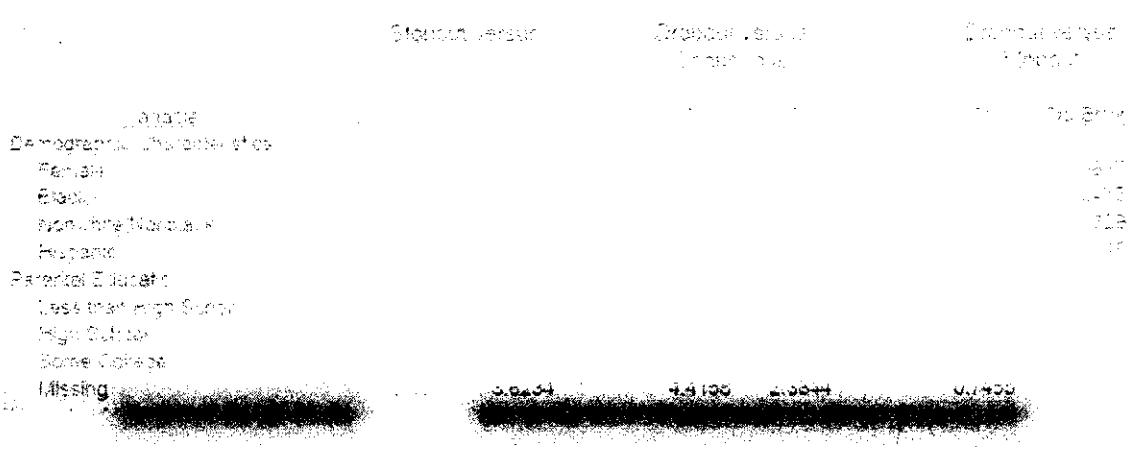
(b) How do you distinguish between Logit Model and Multinomial Logit Model?

(03 Marks)

(c) Following table reproduces a part of the Multinomial regression output reported by Stratton *et al.*, (2005). The authors examine college stopout (i.e. not attending schools for a shorter period of time) and dropout (i.e. moving out of school permanently), and continuous (i.e. keep school going) behavior. While providing theoretical insights, interpret the results appear in the above table.

(05 Marks)

Multinomial Logit Model of Continuous, Stopout, and Dropout Behavior



Note: In the above table, *, **, and *** indicate that the estimated coefficients are significant at 10%, 5%, and 1% levels respectively.

(d) Identify at least three important policy implications.

(10 Marks)

4.

a. What do you mean by panel data? (03 Marks)

b. What are the advantages in using panel data compared to cross-sectional data

(03 Marks)

c. Discuss the difference between Random Effect Model and Fixed Effect Model.

(03 Marks)

d. Following table reproduces results from a panel data analysis conducted in examining the effect of drunk driving on traffic death. The analysis was done by using data from 48 US states for the period of 1982-88.

i. In above analysis, how do you justify the use of panel data analysis against cross-sectional or time series data analysis

(03 Marks)

ii. Interpret the estimated results and identify important policy implications

(08 Marks)

Dependent Variable: Traffic Fatality Rate (10,000)	**Model 1**	**Model 2**	**Model 3**
Beer Tax	-0.45	-0.70	-0.46
	(0.22)	(0.25)	(0.22)
Drinking age 18? (1=if yes)	0.03	-0.01	
	(0.06)	(0.06)	
Drinking age 19? (1=if yes)	-0.02	-0.08	
	(0.04)	(0.04)	
Drinking age 20? (1=if yes)	0.03	-0.10	
	(0.04)	(0.05)	
Drinking age (in years)			-0.002
			(0.02)
Mandatory jail? (1= if Yes)	0.01	-0.03	
	(0.03)	(0.06)	
Mandatory community service? (1=if Yes)	0.03	0.15	
	(0.11)	(0.13)	
Mandatory jail or community service (1= if yes)			0.03
			(0.08)
Average vehicle miles per driver	0.01	0.01	0.01
	(0.01)	(0.01)	(0.01)
Unemployment rate	-0.06		-0.06
	(0.01)		(0.01)
Real income per capita (in log)	1.81		1.79
	(0.47)		(0.45)
State effect	Yes	Yes	Yes
Time effect	Yes	Yes	Yes

Standard errors are given in parentheses

5. Write short notes on each of the followings (04 Marks each)

a. Difference-in-Difference Estimator

b. Barro Cross-Country Growth Equation

c. Gravity Model Estimation

d. Ability bias in Mincerian Equation

e. Independent of Irrelevant Alternatives (IIA) condition

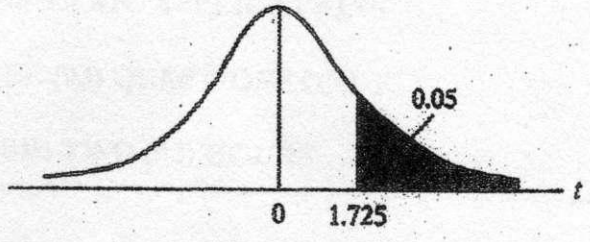
TABLE D.2 PERCENTAGE POINTS OF THE *t* DISTRIBUTION

Example

$\Pr(t > 2.086) = 0.025$

$\Pr(t > 1.725) = 0.05$ for df = 20

$\Pr(|t| > 1.725) = 0.10$



df \ Pr	0.25 0.50	0.10 0.20	0.05 0.10	0.025 0.05	0.01 0.02	0.005 0.010	0.001 0.002
1	1.000	3.078	6.314	12.706	31.821	63.657	318.31
2	0.816	1.886	2.920	4.303	6.965	9.925	22.327
3	0.765	1.638	2.353	3.182	4.541	5.841	10.214
4	0.741	1.533	2.132	2.776	3.747	4.604	7.173
5	0.727	1.476	2.015	2.571	3.365	4.032	5.893
6	0.718	1.440	1.943	2.447	3.143	3.707	5.208
7	0.711	1.415	1.895	2.365	2.998	3.499	4.785
8	0.706	1.397	1.860	2.306	2.896	3.355	4.501
9	0.703	1.383	1.833	2.262	2.821	3.250	4.297
10	0.700	1.372	1.812	2.228	2.764	3.169	4.144
11	0.697	1.363	1.796	2.201	2.718	3.106	4.025
12	0.695	1.356	1.782	2.179	2.681	3.055	3.930
13	0.694	1.350	1.771	2.160	2.650	3.012	3.852
14	0.692	1.345	1.761	2.145	2.624	2.977	3.787
15	0.691	1.341	1.753	2.131	2.602	2.947	3.733
16	0.690	1.337	1.746	2.120	2.583	2.921	3.686
17	0.689	1.333	1.740	2.110	2.567	2.898	3.646
18	0.688	1.330	1.734	2.101	2.552	2.878	3.610
19	0.688	1.328	1.729	2.093	2.539	2.861	3.579
20	0.687	1.325	1.725	2.086	2.528	2.845	3.552
21	0.686	1.323	1.721	2.080	2.518	2.831	3.527
22	0.686	1.321	1.717	2.074	2.508	2.819	3.505
23	0.685	1.319	1.714	2.069	2.500	2.807	3.485
24	0.685	1.318	1.711	2.064	2.492	2.797	3.467
25	0.684	1.316	1.708	2.060	2.485	2.787	3.450
26	0.684	1.315	1.706	2.056	2.479	2.779	3.435
27	0.684	1.314	1.703	2.052	2.473	2.771	3.421
28	0.683	1.313	1.701	2.048	2.467	2.763	3.408
29	0.683	1.311	1.699	2.045	2.462	2.756	3.396
30	0.683	1.310	1.697	2.042	2.457	2.750	3.385
40	0.681	1.303	1.684	2.021	2.423	2.704	3.307
60	0.679	1.296	1.671	2.000	2.390	2.660	3.232
120	0.677	1.289	1.658	1.980	2.358	2.617	3.160
∞	0.674	1.282	1.645	1.960	2.326	2.576	3.090

Note: The smaller probability shown at the head of each column is the area in one tail; the larger probability is the area in both tails.