UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER I
SESSION 2011/2012

COURSE NAME	:	QUANTITATIVE TECHNIQUES FOR REAL ESTATE
COURSE CODE	:	BPE 44303 / BPE 4433
PROGRAM	:	4 BPD
EXAMINATION DATE	:	JANUARY 2012
DURATION	:	3 HOURS
INSTRUCTION	:	ANSWER **ALL** QUESTIONS

THIS QUESTION PAPER CONSISTS OF **FIVE (5)** PAGES

Q1   Multiple regression is a quantitative technique that is widely used in real estate research.

(a)   Define multiple regression analysis.

(5 marks)

(b)   Explain in what circumstances that the regression analysis is require.

(8 marks)

(c)   Discuss the assumption of Ordinary Least Square (OLS) in order to obtain best linear unbiased estimator (BLUE) for multiple regression.

(12 marks)

Q2   It has been noted that there are numbers of factors that affect real estate prices. In real estate research there are studies that shows some of these variables are significantly affect the real estate prices. **Table Q2** shows the results of a cross sectional data analysis.

Table Q2: Multiple regression between transaction price (log natural) and selected independent variables

Source	SS	df	MS		Number of obs	10985
					F(10, 10974)	1693.44
Model	5183.45289	10	518.345289		Prob > F	0
Residual	3359.03714	10974	0.3060905		R-squared	0.6068
					Adj R-squared	0.6064
Total	8542.49004	10984	0.777721234		Root MSE	0.55325
lnPR	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
K_Lumpur (base)						
Kelang	-0.5259141	0.0191081	-27.52	0.000	-0.5633695	-0.4884587
H_Langat	-0.4186711	0.0211464	-19.8	0.000	-0.4601219	-0.3772203
Petaling	-0.2421478	0.014355	-16.87	0.000	-0.2702863	-0.2140093
Gombak	-0.4203495	0.0270845	-15.52	0.000	-0.47344	-0.3672589
lnDIST	-0.0886133	0.0058555	-15.13	0.000	-0.100091	-0.0771355
lnBAREA	0.9147515	0.0083242	109.89	0.000	0.8984346	0.9310683
lnLAREA	0.0308153	0.0134067	2.3	0.022	0.0045358	0.0570948
Low (base)						
Medium	0.0256303	0.0141782	1.81	0.071	-0.0021616	0.0534221
High	0.3117302	0.0182962	17.04	0.000	0.2758664	0.3475941
Age	-0.0008621	0.000653	-1.32	0.187	-0.0021421	0.0004178
cons	8.160767	0.0666061	122.52	0.000	8.030207	8.291327

Where;
lnPR = Transaction price in log natural.
Kuala Lumpur, Kelang, H_Langat, Petaling and Gombak = Take value of 1 if transaction occurred in respective location and 0 otherwise.

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lnDIST = Distance in log natural.
lnBAREA = Built-up area in log natural.
lnLAREA = land area in log natural.
Low, Medium and High = Take value of 1 if transacted property is in the respective heights category and 0 otherwise.
Age = Age of the transacted property.

You are require to provide an analysis that discuss the results of cross-sectional analysis as shown in **Table Q2**.

(25 marks)

Q3   Analysis of time series data requires each observation to be arranged in its respective time period. **Table Q3** shows two variables that represent house price index (HPI) and broad money supply (M3).

Table Q3: House Price Index (HPI)
and Broad Money Supply (M3)

PERIOD	HPI	M3
MAC:2004	113	568,522
JUN:2004	114	578,392
SEP:2004	114	591,972
DEC:2004	115	617,639
MAC:2005	115	644,015
JUN:2005	117	652,273
SEP:2005	117	656,557
DEC:2005	118	667,327
MAC:2006	118	690,830
JUN:2006	119	700,538
SEP:2006	119	716,266
DEC:2006	123	760,302
MAC:2007	123	789,223
JUN:2007	124	788,611
SEP:2007	125	804,249
DEC:2007	126	832,788

(a)   Based on information as shown in **Table Q3**, prepare a graph that shows the pattern of relationships between HPI and M3.

(5 marks)

(b)   State the Vector Autoregressive (VAR) equation up to four lags for HPI and M3.

(5 marks)

(c)   Explain equation in **Q3(b)** with respect to causality analysis.

(15 marks)

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Q4 In the analysis of long run relationship between variables, there are steps that need to be observed in order for the analysis to produce valid result.

    (a) Illustrate the steps that are required in order to conduct cointegration analysis between two variables.

                                                  (10 marks)

    (b) Please refer to **Figure Q4**, **Table Q4(i)** and **Table Q4(ii)**.

Figure Q4: Total loan to business (BUSLOAN)
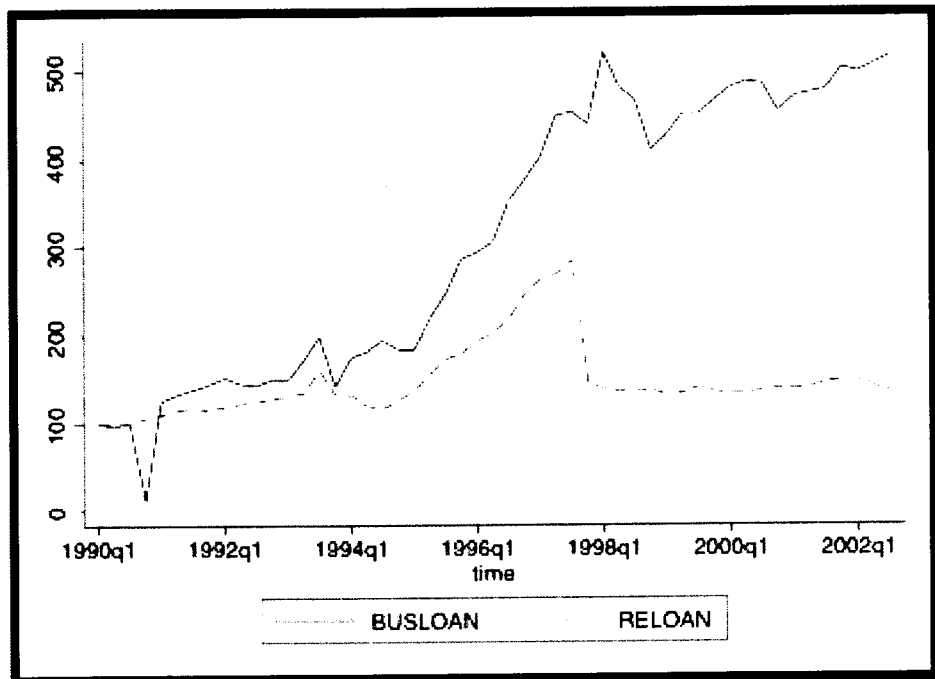and total loan to real estate (RELOAN)

Table Q4(i): Cointegration regression between total loan to business
and total loan to real estate.

Source	SS	df	MS		Number of obs	51
					F(1, 49)	8.02
Model	12397.3264	1	12397.3264		Prob > F	0.0067
Residual	75759.7654	49	1546.11766		R-squared	0.1406
					Adj R-squared	0.1231
Total	88157.0918	50	1763.14184		Root MSE	39.321
RELOAN	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
BUSLOAN	0.1000146	0.03532	2.83	0.007	0.0290364	0.170993
cons	115.9059	12.30575	9.42	0.000	91.17655	140.6352

Table Q4(ii): Augmented Dickey Fuller (ADF) unit-root test
on regression residuals.

	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-1.983	-3.580	-2.930	-2.600
MacKinnon approximate p-value for Z(t) = 0.2939				

Based on the information given in **Figure Q4**, **Table Q4(i)** and **Table Q4(ii)** make an analysis that discuss the characteristic of long-run relationship between RELOAN and BUSLOAN.

(15 marks)

END OF QUESTION PAPER