Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2016/2017

COURSE NAME	:	QUANTITATIVE TECHNIQUES FOR REAL ESTATE
COURSE CODE	:	BPE 44303
PROGRAMME CODE	:	BPD
EXAMINATION DATE	:	JUNE 2017
DURATION	:	3 HOURS
INSTRUCTION	:	ANSWERS **ALL** QUESTIONS

THIS QUESTION PAPER CONSISTS OF **SIX (6)** PAGES

Q1 A property valuer wants to get an overview of the price for double-storey terrace house sized 1500 square feet in a specified area. The data obtained from the Valuation and Property Services Department are as follows:

Table Q1: Double-storey terrace house price

ID	Address	Price (MYR)
1	34, Jalan 2, Taman Layang	MYR 250,000.00
2	12, Jalan 9, Taman Manis	MYR 230,000.00
3	21, Jalan 7, Taman Rama-Rama	MYR 220,000.00
4	43, Jalan 4a, Taman Helang	MYR 243,897.00
5	64, Jalan T1, Taman Merak	MYR 212,653.00
6	86, Jalan 6, Taman Semantan	MYR 199,435.00
7	23, Jalan Subang, Taman Maju Height	MYR 212,985.00
8	11, Jalan Haji Abu, Taman Tun	MYR 243,000.00
9	45, Lorong Qi, Taman Suasana	MYR 222,222.00
10	22, Jalan 10b, Taman Intan	MYR 219,042.00

(a) Compute the following;

(i) Population mean.

(5 marks)

(ii) Population variance.

(5 marks)

(iii) Population standard deviation.

(5 marks)

(b) An analysis of 10 double-storey terrace house price sized 1500 square feet in the another area shows the mean to be MYR 263,122.20 with the standard deviation of MYR 157,29.17.

Compare the two areas.

(10 marks)

Q2 A group of researchers from JBS Property Consultant wishes to investigate the relationship between Locational Quality Index (percentage) and Rental (RM/psf) on retails in two areas at Johor Bahru. A random sample of ten unit retails were observed over the fieldwork of two weeks, and the following data was obtained:

Table Q2: Locational Quality Index (percentage) and Rental (RM/psf) on retails in two areas at Johor Bahru

Area A		
UNIT	**(Y) LQI (%)**	**(X) RENTAL (RM/psf)**
1	70	4.3
2	45.6	4
3	81.4	4.8
4	82.3	4.7
5	42.4	2.8
6	51.2	3.3
7	72.3	4.5
8	60.2	3.7
9	52.4	3
10	73	4.7

Area B		
UNIT	**(Y) LQI (%)**	**(X) RENTAL (RM/psf)**
1	50.1	1.3
2	23.4	2
3	25.6	2.8
4	23.4	2.7
5	25.1	1.8
6	34.1	1.3
7	34.5	2.3
8	43.1	1.7
9	45.8	1
10	27.3	2.7

(a) Plot a scatter diagram for this data

(2 marks)

(b) Explain your diagram in **Q2(a)**.

(3 marks)

(c) Calculate the correlation coefficient of area A and B.

(10 marks)

(d) Explain your answer in **Q2(c)**.

(10 marks)

Q3 Traditional methods of time series analysis are concerned with decomposing of a series into a trend, a seasonal variation and other irregular fluctuations. Although this approach is not always the best, it is however still useful. The components, by which time series is composed of, are called component of time series data.

(a) Interpret the time series component below with suitable sketch:

(i) Trend Component

(5 marks)

(ii) Seasonal Component

(5 marks)

(iii) Cyclical Component

(5 marks)

(iv) Irregular Component

(5 marks)

(v) Cyclical vs. Seasonal

(5 marks)

Q4 A researcher at MH International Property Developer wishes to predict the sale of houses based on the income (in millions MYR). Using a regression analysis, the summary output is presented as **Figure Q4** below:

Regression Statistics	
Multiple R	0.8808
R Square	0.7758
Adjusted R Square	0.7598
Standard Error	48.8155
Observations	16

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	115424.56	115424.56	48.44	0.00
Residual	14	33361.38	2382.96		
Total	15	148785.94			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	-15.7863	44.0015	-0.3588	0.7251	-110.1603	78.5877
Income	4.1920	0.6023	6.9597	0.0000	2.9001	5.4838

Figure Q4: Regression analysis output

(a) Based on the output, answer the following questions:

(i) Illustrate the regression equation.

(2 marks)

(ii) Interpret the value of the coefficient for Income (X).

(2 marks)

(iii) Describe the variability in Sales from the model.

(2 marks)

(iv) Explain the computed R-Squared.

(2 marks)

(v) Summarize the overall regression model.

(2 marks)

(vi) Explain the significant trend.

(2 marks)

(vii) Predict the Sales for income equal to 17 and 18, respectively.

(3 marks)

(b) An example of model of consumer behaviour evaluates the relationship between people perception about their living environment and their willingness to pay for rental (WTP Rental) of low-cost flats in Pulau Pinang.

H_0: *Residents in the low-income brackets who live in low-cost resident units (e.g. low cost flat, low-cost apartment) do not perceive good living conditions to be the determining factors for their willingness to pay for rental.*

H_1: *Respondents tend to be quite indifferent towards living conditions within their living quarters.*

WTP Rental Model:

$$\text{WTP Rental} = \beta \times \text{INFRA}_{\beta 1} \times \text{PUBLIC}_{\beta 2} \times \text{ACCES}_{\beta 3} \times \text{CHARG}_{\beta 4} \times \text{SECUR}_{\beta 5} \times \text{RUBBIS}_{\beta 6} \times \text{DRAIN}_{\beta 7} \times \text{DESIGN}_{\beta 8} \times e$$

where the independent variables represent respondents' perception about the level of quality of infrastructure (INFRA); quality of public facilities in their neighbourhood (PUBLIC); accessibility of their living area (ACCES); appropriateness of service charges imposed by the local authority (CHARG); level of security in the residential compound (SECUR); quality of garbage collection service (RUBIS); residents' satisfaction with the drainage system (DRAIN); and perceived importance of design of living unit (DESIGN). The data collected was analysed using multiple regression technique. Results of the analysis are as follows:

Adj. R^2	0.172	
F-value	4.089	
SEE/SSE	80235.956/26.886	
Variables	Coefficient	t-value
(Constant)	174.858	21.523***
-Perceived level of quality of infrastructure	-0.936	-0.016
-Perceived quality of public facilities in their neighbourhood	76.364	2.995**
-Perceived accessibility of their living area	11.465	0.308
-Perceived appropriateness of service charges imposed by the local authority	-72.213	-4.158**
-Perceived level of security in the residential compound	11.607	0.755
-Perceived quality of garbage collection service	11.434	0.626
-Residents' satisfaction with the drainage system	-5.664	-0.239
-Perceived importance of design of living unit	14.782	0.724

** Significant at $\alpha = 0.05$

Discuss whether the tenants are concerned with the quality of their living environment based on regression analysis output.

(10 marks)

-END OF QUESTIONS -