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UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER II
SESSION 2016/2017**

COURSE NAME : DATA ANALYSIS
COURSE CODE : BWA 21003
PROGRAMME CODE : BWA
EXAMINATION DATE : JUNE 2017
DURATION : 3 HOURS
INSTRUCTION : ANSWER ALL QUESTIONS

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THIS QUESTION PAPER CONSISTS OF SEVEN(7) PAGES

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- Q1** (a) Explain **TWO (2)** differences between primary data and secondary data. (4 marks)
- (b) List **FIVE (5)** steps of statistical analysis. (5 marks)
- (c) State **FOUR (4)** scales of measurement. Give **ONE (1)** example of each scale. (8 marks)
- (d) What can you interpret on the data skewness based on the three different histograms given in **Appendix 1**. (6 marks)
- Q2** (a) Construct an appropriate comparison graphical chart for the data set in **Table Q2(a)**. Interpret your graph.

Table Q2(a): Temperature data

Month	Min Temperature	Max Temperature
1	38	61
2	43	65
3	50	72
4	56	76
5	64	83
6	68	90
7	72	91
8	73	90
9	69	87
10	55	59
11	48	54
12	56	67

(6 marks)

- (b) A group of researcher wants to investigate the difference of examination marks between Bahasa Melayu and English collected from 29 secondary student. By using result given in **Appendix 2**, test whether there is any difference between both subjects. Use $\alpha = 0.05$

(6 marks)

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Q3 An auto manufacturing company wanted to investigate how the price of one of its car models depreciates with age. They took a sample of twelve cars of this model and collected the following information on the ages (in years) and prices (in RM) of these cars. Refer to the **Appendix 3** for SPSS output.

- (a) What can you conclude from the scatter diagram? (2 marks)
- (b) Write down the estimated regression line. Interpret the slope. (4 marks)
- (c) If the car is 7 years old, what is the depreciated price? (2 marks)
- (d) Do the data support the existence of a linear relationship between age and price? Test using $\alpha = 0.05$. (5 marks)
- (e) Find the Pearson correlation coefficient. What can you infer from the value? (4 marks)
- (f) Comment on the proportion of total variability in price explained by the model. (3 marks)

Q4 (a) The lecturer claims that the proportions of grades in Calculus course for a particular semester are 2%, 17%, 35%, 43% and 3%, respectively. She conducted a study and obtained a result as in **Table Q4(a)**.

Table Q4(a): Grade results

Grade	Frequency
A	10
B	15
C	25
D	32
F	12

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Can we accept the claim at the significant level of 0.05?

(10 marks)

- (b) In an experiment to study the dependence of hypertension on smoking habits, data in **Table Q4(b)** are taken on 180 individuals.

Table Q4(b): Smoking habits

	Nonsmokers	Moderate smokers	Heavy smokers
Hypertension	21	36	40
No hypertension	28	41	29

Test the hypothesis that the presence or absence of hypertension is independent of smoking habits. Use 0.05 level of significance.

(10 marks)

- Q5** The data **Table Q5** represent the number of hours relief provided by 5 different brands of headache tablets administered to 25 subjects experiencing fevers of $38^{\circ}C$ or more.

Table Q5: Brands of tablets

A	B	C	D	E
4.2	10.1	3.2	2.4	7.1
5.7	7.1	7.1	3.4	6.6
9.1	8.2	2.2	4.1	9.3
4.2	8.0	3.1	1.0	4.2
5.0	9.9	5.2	4.0	5.6

- (a) Construct ANOVA table. (10 marks)
- (b) From result in **Q5(a)**, test the hypothesis that the mean number of hours of relief provided by the tablets is the same for all 5 brands. Use 0.05 level of significance. (8 marks)
- (c) Perform the Duncan's multiple range-test to analyse the means of the 5 different brands of headache. Use 0.05 level of significance. Refer **Appendix 4** for the Duncan table. (10 marks)

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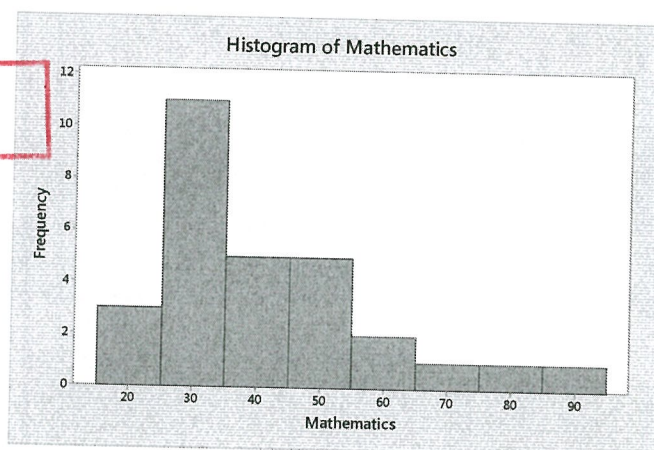
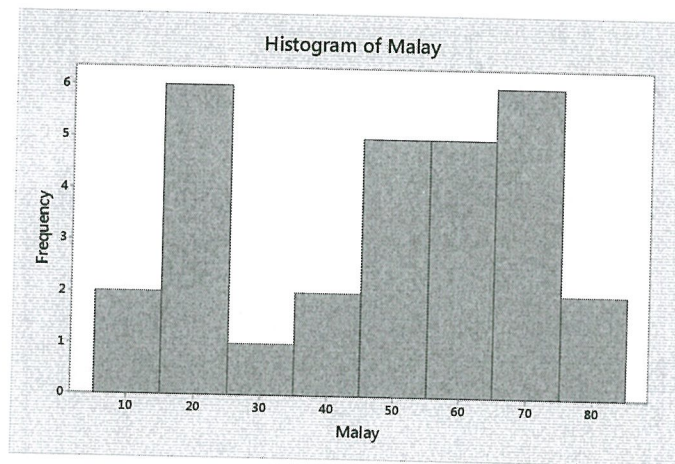
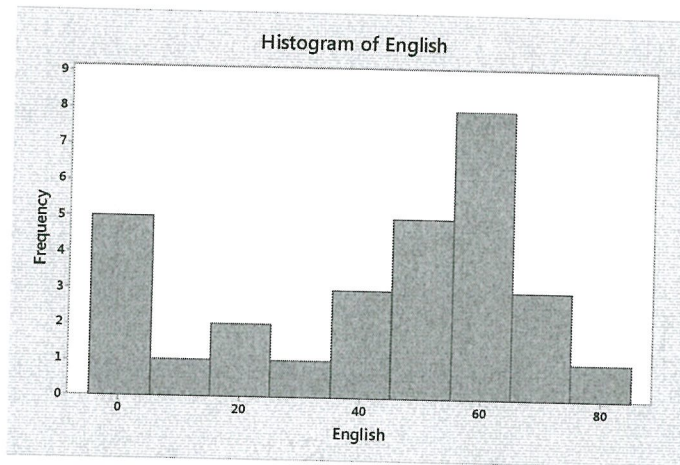
- END OF QUESTIONS -

FINAL EXAMINATION

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APPENDIX 1



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UNIVERSITI TEKNOLOGI MALAYSIA
FACULTY OF BUSINESS AND MANAGEMENT
DEPARTMENT OF STATISTICS

APPENDIX 2

Two-Sample T-Test and CI: English, Malay

Two-sample T for English vs Malay

	N	Mean	StDev	SE Mean
English	29	41.3	24.1	4.5
Malay	29	46.7	22.3	4.1

Difference = μ (English) - μ (Malay)

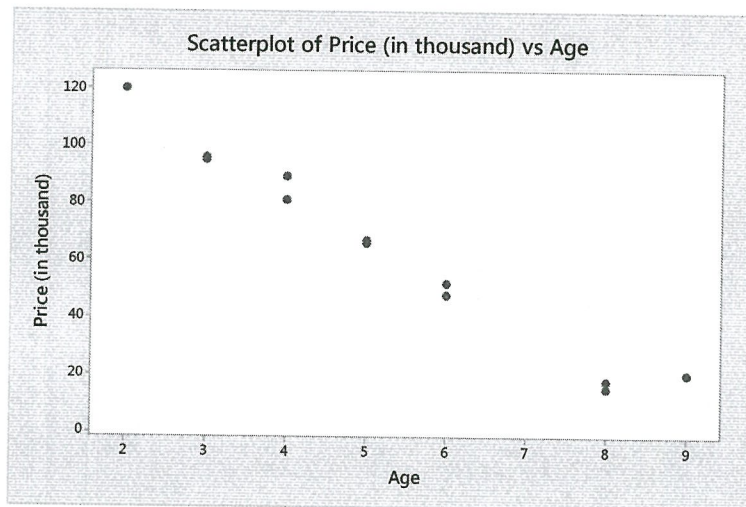
Estimate for difference: -5.38

95% CI for difference: (-17.58, 6.82)

T-Test of difference = 0 (vs \neq): T-Value = -0.88 P-Value = 0.381 DF = 56

Both use Pooled StDev = 23.1826

APPENDIX 3



Model Summary

Model	R Square	Adjusted R Square	Std. Error of the Estimate
1	.970	.966	6.98633

a. Predictors: (Constant), Age

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10999.894	1	10999.894	225.367	.000 ^b
	Residual	341.662	7	48.809		
	Total	11341.556	8			

a. Dependent Variable: Price

b. Predictors: (Constant), Age

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Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	145.850	6.285		23.208	.000
	Age	-15.464	1.030	-.985	-15.012	.000

a. Dependent Variable: Price

APPENDIX 4

Critical values for Duncan's multiple range tests $r(0.05, p, df)$												
df \ p	2	3	4	5	6	7	8	9	10	11	12	13
1	17.969	17.969	17.969	17.969	17.969	17.969	17.969	17.969	17.969	17.969	17.969	17.969
2	6.085	6.085	6.085	6.085	6.085	6.085	6.085	6.085	6.085	6.085	6.085	6.085
3	4.501	4.516	4.516	4.516	4.516	4.516	4.516	4.516	4.516	4.516	4.516	4.516
4	3.926	4.013	4.033	4.033	4.033	4.033	4.033	4.033	4.033	4.033	4.033	4.033
5	3.635	3.749	3.796	3.814	3.814	3.814	3.814	3.814	3.814	3.814	3.814	3.814
6	3.46	3.586	3.649	3.68	3.694	3.697	3.697	3.697	3.697	3.697	3.697	3.697
7	3.344	3.477	3.548	3.588	3.611	3.622	3.625	3.625	3.625	3.625	3.625	3.625
8	3.261	3.398	3.475	3.521	3.549	3.566	3.575	3.579	3.579	3.579	3.579	3.579
9	3.199	3.339	3.42	3.47	3.502	3.523	3.536	3.544	3.547	3.547	3.547	3.547
10	3.151	3.293	3.376	3.43	3.465	3.489	3.505	3.516	3.522	3.525	3.525	3.525
11	3.113	3.256	3.341	3.397	3.435	3.462	3.48	3.493	3.501	3.506	3.509	3.51
12	3.081	3.225	3.312	3.37	3.41	3.439	3.459	3.474	3.484	3.491	3.495	3.498
13	3.055	3.2	3.288	3.348	3.389	3.419	3.441	3.458	3.47	3.478	3.484	3.488
14	3.033	3.178	3.268	3.328	3.371	3.403	3.426	3.444	3.457	3.467	3.474	3.479
15	3.014	3.16	3.25	3.312	3.356	3.389	3.413	3.432	3.446	3.457	3.465	3.471
16	2.998	3.144	3.235	3.297	3.343	3.376	3.402	3.422	3.437	3.449	3.458	3.465
17	2.984	3.13	3.222	3.285	3.331	3.365	3.392	3.412	3.429	3.441	3.451	3.459
18	2.971	3.117	3.21	3.274	3.32	3.356	3.383	3.404	3.421	3.435	3.445	3.454
19	2.96	3.106	3.199	3.264	3.311	3.347	3.375	3.397	3.415	3.429	3.44	3.449
20	2.95	3.097	3.19	3.255	3.303	3.339	3.368	3.39	3.409	3.423	3.435	3.445
21	2.941	3.088	3.181	3.247	3.295	3.332	3.361	3.385	3.403	3.418	3.431	3.441
22	2.933	3.08	3.173	3.239	3.288	3.326	3.355	3.379	3.398	3.414	3.427	3.437
23	2.926	3.072	3.166	3.233	3.282	3.32	3.35	3.374	3.394	3.41	3.423	3.434
24	2.919	3.066	3.16	3.226	3.276	3.315	3.345	3.37	3.39	3.406	3.42	3.431
25	2.913	3.059	3.154	3.221	3.271	3.31	3.341	3.366	3.386	3.403	3.417	3.429
26	2.907	3.054	3.149	3.216	3.266	3.305	3.336	3.362	3.382	3.4	3.414	3.426
27	2.902	3.049	3.144	3.211	3.262	3.301	3.332	3.358	3.379	3.397	3.412	3.424
28	2.897	3.044	3.139	3.206	3.257	3.297	3.329	3.355	3.376	3.394	3.409	3.422
29	2.892	3.039	3.135	3.202	3.253	3.293	3.326	3.352	3.373	3.392	3.407	3.42
30	2.888	3.035	3.131	3.199	3.25	3.29	3.322	3.349	3.371	3.389	3.405	3.418

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