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UNIVERSITI TUN HUSSEIN ONN MALAYSIA

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

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COURSE NAME : STATISTICAL CONSULTATION
COURSE CODE : BWB 32503
PROGRAMME CODE : BWQ
EXAMINATION DATE : DECEMBER 2016 / JANUARY 2017
DURATION : 3 HOURS
INSTRUCTION : ANSWER ALL QUESTIONS

THIS QUESTION PAPER CONSISTS OF FIVE (5) PAGES

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- Q1** (a) There are two types of consulting environments. Classify both types and give an example for each type. (6 marks)
- (b) A good statistical consultant requires combination of knowledges. Describe each knowledge required for a good statistical consultant. (8 marks)
- (c) Establishing a Statistical Consulting Program (SCP) at a university can provide invaluable internal support for researchers across a broad range of disciplines. Once established, the SCP will also provide exposure for the university through external consulting activities and outside grant solicitation. Plan **THREE (3)** suitable activities for a consultant in SCP at a university. (6 marks)
- Q2** (a) Good communication skills are required in order to become an effective consultant. Give the common elements that involve in the communication process. (2 marks)
- (b) “The final stage of our verbal interaction with the client involves identifying our specific contributions. This is important to ensure that both we and the client understand clearly our respective roles in the project.”
Discover the necessary actions to be taken as a consultant in the data management, data analysis, statistical analysis and report writing. (8 marks)
- (c) Compare between executive summary and abstract. (4 marks)
- (d) An effective presentation is one of the important skills in consultation. Discover how a good consultant make an effective presentation in terms of non-verbal language, voice quality and preparation for the presentation. (6 marks)
- Q3** (a) “The dataset that is actually used for analysis is often several stages removed from the original or raw data values. The process of data cleaning "transforms" the original dataset by performing tasks such as removing errors, adjusting outliers, estimating missing values, encoding categorical variables, and standardizing variables. Simple operations such as the sum, difference, or ratio may also be applied to create new variables.”

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Point out why we need to do transformation to our dataset.

(4 marks)

- (b) In exercise physiology, an objective measure of aerobic fitness is the oxygen consumption in volume per unit body weight per unit time. Thirty-one individuals were used in an experiment in order to model oxygen consumption against age in years (x_1), weight in kilograms (x_2), time to run 112 miles (x_3), resting pulse rate (x_4), pulse rate at the end of run (x_5), and maximum pulse rate during run (x_6).

As part of the research team in fitness consultation, summarize the results from the **Figure Q3(b)** below according to regression analysis, stepwise regression and correlations among the variables.

Regression Analysis: Y versus X1, X2, X3, X4, X5 and X6

Predictor	Coef	SE Coef	T	P
Constant	102.24	12.45	8.21	0.000
X1	-0.21992	0.09959	-2.21	0.037
X2	-0.07238	0.05467	-1.32	0.198
X3	-2.6805	0.3749	-7.15	0.000
X4	-0.00084	0.05863	-0.01	0.989
X5	-0.3732	0.1207	-3.09	0.005
X6	0.3047	0.1372	2.22	0.036

S = 2.32206 R-Sq = 84.8% R-Sq(adj) = 81.0%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	6	721.97	120.33	22.32	0.000
Residual Error	24	129.41	5.39		
Total	30	851.38			

Stepwise Regression: Y versus X1, X2, X3, X4, X5 and X6

Alpha-to-Enter: 0.15 Alpha-to-Remove: 0.15
Response is Y on 6 predictors, with N = 31

Step	1	2	3	4
Constant	82.42	88.46	111.72	98.15
X3	-3.31	-3.20	-2.83	-2.77
T-Value	-9.17	-8.93	-7.89	-8.13
P-Value	0.000	0.000	0.000	0.000
X1		-0.150	-0.256	-0.198
T-Value		-1.57	-2.66	-2.07
P-Value		0.127	0.013	0.049
X5			-0.131	-0.348
T-Value			-2.59	-2.96
P-Value			0.015	0.006
X6				0.27
T-Value				2.02
P-Value				0.053

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S	2.74	2.68	2.44	2.31		
R-Sq	74.34	76.42	81.11	83.68		
R-Sq (adj)	73.45	74.74	79.01	81.17		
Mallows Cp	13.5	12.2	6.8	4.8		

Correlations: Y, X1, X2, X3, X4, X5 and X6

	Y	X1	X2	X3	X4	X5
X1	-0.305 0.096					
X2	-0.163 0.382	-0.234 0.206				
X3	-0.862 0.000	0.189 0.309	0.144 0.441			
X4	-0.346 0.056	-0.142 0.447	0.023 0.904	0.401 0.026		
X5	-0.398 0.027	-0.338 0.063	0.182 0.328	0.314 0.086	0.318 0.081	
X6	-0.237 0.200	-0.433 0.015	0.249 0.176	0.226 0.221	0.258 0.162	0.930 0.000

Figure Q3(b): Output for regression analysis, stepwise analysis and correlation

(16 marks)

- Q4** (a) Differentiate between descriptive study and exploratory study. (4 marks)
- (b) Define the non-probability sampling. Give three examples of non-probability sampling and explain the advantages and disadvantages for each example. (8 marks)
- (c) Explain and give an example for each scale given below: (8 marks)
- (i) Dichotomous scale
 - (ii) Category scale
 - (iii) Likert scale
 - (iv) Numerical scale
- Q5** (a) You are appointed to conduct a survey for a transportation company in August 2016. The company, Syarikat Prasarana Negara Berhad ask you to find out the public opinion on awareness, usage and satisfaction on LRT services in Kuala Lumpur.

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- (i) Design a cover page for your final report. (2 marks)
 - (ii) Evaluate the methods of research in your final report. Your final report must include the information about your sample selection, survey procedure and data analysis. (12 marks)
- (b) Distinguish between test-retest reliability, parallel-form reliability and criterion-related validity. (6 marks)

-END OF QUESTIONS-