UNIVERSITI SAINS MALAYSIA

Second Semester Examination
Academic Session 94/95
April 1995

AGW 602   RESEARCH METHODOLOGY

Time: [2 hours]

<u>Instruction</u>

Please ensure that this examination paper consists of SIX (6) printed pages before you begin.

There are 4 questions here. Answer ALL questions. Each question has two parts; A and B and you are required to answer only one part to each question.

Each question carries equal marks.

SECTION A

Q1A. A local business has asked you to select a sample of seventy-five potential managerial professionals(PMP) from your campus. The manager wants these PMPs to evaluate their new, easy-to-use microcomputer for business applications. The store carries five different computers. Describe and justify the sampling process you would use.

Please ensure you describe the population, population/sampling frame, the sampling design and the data collection method.

[25 marks]

Q1B. Is there a relationship between the level (e.g nominal, ratio) of measurement and the choice of parametric versus non-parametric statistical tools? What impact does the resulting empirical level of data have on the choice of a statistical technique to test a hypothesis?
[25 marks]

Q2A. A market survey conducted by a local agency seeks to find out the buying styles of the different ethnic groups. In particular, it look at the monthly expenditure on consumer products and their buying style in terms of the way they stick to product brands that they are familiar with (The question asked was: "I am always hesitant about buying unknown brand." using the scale 1 (Strongly agree) 2 (agree) 3 (Unsure/Don't know) 4 (Disagree) and 5 (Strongly disagree). The SPSS results are as shown below.

For each of the analyses, answer the following:

i.   What is the hypothesis tested?
ii. Is the test used appropriate? Why?
iii. What conclusions can be drawn from the analysis?

[25 marks]

Result of a one-way ANOVA for monthly expenditure

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- - - - - O N E W A Y - - - - -
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Variable MEXP   Total Monthly Expenditure
By Variable Q152   Q28. Race

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	116724857.6	38908285.87	64.1761	.0000
Within Groups	1020	618399415.8	606273.9371		
Total	1023	735124273.4			

Group	Count	Mean	Standard Deviation	Standard Error	95 Pct Conf Int for Mean		
Grp 1	561	700.2317	522.1099	22.0435	656.9337	TO	743.5298
Grp 2	355	1387.0704	1057.5376	56.1283	1276.6836	TO	1497.4572
Grp 3	95	1115.7895	719.5870	73.8281	969.2021	TO	1262.3768
Grp 4	13	1956.9231	1327.9645	368.3111	1154.4422	TO	2759.4039
Total	1024	992.8516	847.7007	26.4906	940.8693	TO	1044.8338

Multiple Range Tests: Duncan test with significance level .05

The difference between two means is significant if
  MEAN(J)-MEAN(I) >= 550.5788 * RANGE * SQRT(1/N(I) + 1/N(J))
  with the following value(s) for RANGE:

Step   2   3   4
RANGE   2.78 2.92 3.01

(*) Indicates significant differences which are shown in the lower triangle

```
              G G G G
              r r r r
              P P P P

              1 3 2 4
   Mean     Q152

  700.2317  Grp 1
 1115.7895  Grp 3    *
 1387.0704  Grp 2    * *
 1956.9231  Grp 4    * * *
```

3/-

Results of nonparametric Kruskal-Wallis oneway ANOVA.

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- - - - - Kruskal-Wallis 1-Way Anova

    Q18A5    Q4. BUYING STYLE - I am always hesitant about buying unknown
             brand
by Q152    Q28. Race


    Mean Rank    Cases

       465.42      561    Q152 =    1    Malay
       562.45      355    Q152 =    2    Chinese
       594.62       95    Q152 =    3    Indian
       580.27       13    Q152 =    4    Others

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                  1024    Total


                                              Corrected for ties
    Chi-Square     D.F.  Significance    Chi-Square     D.F.  Significance
       32.3524        3        .0000       36.0662         3        .0000
```

Q2B. A regression was carried out to predict the share price of a public listed company using the explanatory variables: dividend paid per share, earnings per share, percentage change in total sales, percentage change in net income, percentage change in assets, closing price the previous year, market traded (whether it was traded on the KLSE or some other bourses), and company type (whether or not it is a financial institution).

i. SPSS regression procedure using the METHOD ENTER on all the explanatory variables except market traded and company type produces the following results.

```
Equation Number 1    Dependent Variable..    PRICE    Closing price of share on 4/1/1993

Block Number  1.  Method:   Enter
    DASSETS  DINCOME  DIV      DSALES    EPS        OLDPRICE


Variable(s) Entered on Step Number
    1..    OLDPRICE   Closing price on 4/1/92
    2..    DINCOME    Percentage change in 1992 net income
    3..    DASSETS    Percentage change in 1992 assets
    4..    DSALES     Percentage change in 1992 sales
    5..    DIV        Dividend paid in 1992
    6..    EPS        Earnings per share 1992


Multiple R           .89686
R Square             .80435
Adjusted R Square    .74845
Standard Error      8.57719

Analysis of Variance
                    DF      Sum of Squares      Mean Square
Regression           6          6351.59167       1058.59861
Residual            21          1544.93144         73.56816

F =    14.38936       Signif F =   .0000
```

```
------------------- Variables in the Equation -------------------

Variable           B          SE B        Beta         T    Sig T

DASSETS         -.018021    .129230     -.018761     -.139   .8904
DINCOME          .039584    .040367      .103427      .981   .3380
DIV            -7.712453   4.960007     -.213663    -1.555   .1349
DSALES           .035157    .156284      .028399      .225   .8242
EPS             3.823173   2.319902      .260593     1.648   .1142
OLDPRICE        1.532665    .255146      .817404     6.007   .0000
(Constant)     -5.791265   5.626433                 -1.029   .3151
```

Durbin-Watson Test =   2.52704

Interpret the above results in terms of the validity of the model and the important factors that affects stock prices.

ii. Supposing now we include the variables company status and market traded. Below is the result of the SPSS analysis. Is there evidence that other things being equal, being listed on the KLSE has any significant effect on the price? At significance level 0.10, do share prices of financial institutions differ significantly from those of other companies in the group?

[25 marks]

```
Variable(s) Entered on Step Number
   1..  BANK       Is it a financial institution
   2..  OLDPRICE   Closing price on 4/1/92
   3..  KLSE       Bourse traded
   4..  DASSETS    Percentage change in 1992 assets
   5..  DINCOME    Percentage change in 1992 net income
   6..  DIV        Dividend paid in 1992
   7..  EPS        Earnings per share 1992
   8..  DSALES     Percentage change in 1992 sales
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```
Multiple R            .90406
R Square              .81732
Adjusted R Square     .74040
Standard Error       8.71334
```

```
Analysis of Variance
                 DF      Sum of Squares     Mean Square
Regression        8         6453.99898       806.74987
Residual         19         1442.52413        75.92232

F =    10.62599      Signif F =   .0000
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---------------------- Variables in the Equation ----------------------------

Variable          B          SE B       Beta        VIF        T    Sig T

DASSETS        .002361     .132673    .002458      1.984     .018   .9860
DINCOME        .024329     .047206    .063567      1.582     .515   .6122
DIV          -9.641690    5.422872   -.267109      2.347   -1.778   .0914
DSALES        -.032411     .224804   -.026180      3.430    -.144   .8869
EPS           4.380539    2.637238    .298584      3.361    1.661   .1131
OLDPRICE      1.460608     .278853    .778974      2.300    5.238   .0000
KLSE          4.545886    3.936568    .133959      1.400    1.155   .2625
BANK          -.181199    6.706376   -.005039      3.618    -.027   .9787
(Constant)   -5.852804    6.576719                          -.890   .3846
```

5/-

Collinearity Diagnostics

Number	Eigenval	Cond Index	Variance Proportions Constant	DASSETS	DINCOME	DIV	DSALES	EPS
1	5.64761	1.000	.00182	.00355	.00652	.00337	.00133	.00222
2	1.61262	1.871	.00021	.03061	.00139	.00320	.05939	.00284
3	.68101	2.880	.00026	.03130	.24284	.04159	.00121	.00165
4	.47767	3.439	.00442	.13800	.19829	.00160	.00613	.00222
5	.21691	5.103	.00185	.21478	.07195	.02623	.21983	.03578
6	.16184	5.907	.01696	.14620	.39004	.04192	.27511	.00064
7	.10653	7.281	.02422	.04477	.00679	.62108	.00007	.23288
8	.06024	9.683	.41573	.36652	.08121	.18079	.09637	.31595
9	.03558	12.599	.53453	.02427	.00097	.08022	.34055	.40581

	OLDPRICE	KLSE	BANK
1	.00186	.00650	.00238
2	.00002	.00309	.02887
3	.00539	.02653	.04321
4	.00637	.21574	.01851
5	.00017	.56122	.01932
6	.02373	.08144	.40023
7	.09879	.05661	.02849
8	.17543	.02852	.04002
9	.68824	.02034	.41896

Durbin-Watson Test = 2.55130

Q3A. Buyers commitment is important to any producer of components. Develop a suitable measure for this concept by identifying the various elements and items of each element for this concept.

[25 marks]

Q3B. Discuss the concepts of reliability and validity of measures, how and they can be measured and their significance in business research.

[25 marks]

Q4. Select one of the following situations and .

i. Define the problem
ii. Develop a theoretical framework
iii. Extract the relevant hypotheses from the framework.

[25 marks]

A. **SITUATION 1**

The probability of cancer victims successfully recovering under treatment was studied by a medical researcher in a hospital. She found three variables to be important for recovery:

o Quick and correct diagnosis by the doctor
o The nurse's careful following of doctor's instructions.
o Peace and quiet in the vicinity.

...6/-

In a quiet atmosphere, the patient rested well and recovered sooner. Patients who were admitted in advanced stages of cancer did not respond to treatment even though the doctor's diagnosis was done immediately on arrival, the nurses did their best, and there was plenty of peace and quiet in the area.

B. SITUATION 2

A production manager is concerned about the low output levels of his employees. The articles that he read on job performance frequently mentioned four variables as important to job performance are skill required by the job, rewards, motivation, and satisfaction. In several of the articles, it was also indicated that only if the rewards were attractive to the recipients, did motivation, satisfaction and job performance increase, and not otherwise.

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