# UNIVERSITI SAINS MALAYSIA Master of Business Administration

First Semester Examination Academic Session 1995/96

October/November 1995

### **AGW602 - RESEARCH METHODOLOGY**

Time : [2 hours]

## **INSTRUCTIONS:**

Please make sure that this examination paper consists of NINE (9) printed pages before you begin.

There are three sections to this examination paper. Answer ONE (1) question from EACH section.

#### SECTION A

- 1. Suppose you wish to compile a list of "500 best companies to work for in Malaysia" using some form of rating system.
- a. What five dimensions can you use?
- b. Develop elements for each dimension and find observable indicators that you might use to measure them.
- c. How would you compile all these indicators into a single index?
- d. How would you judge reliability and validity of your measurement?

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[30 marks]

- 2a. Comment on the following sampling design.
  - i. A department store that wishes to examine whether it is losing or gaining customers draws a sample from its list of credit card holders by selecting every 10th name.
  - ii. A car manufacturer decided to research consumer characteristics by sending 100 questionnaires to each of its dealer. The dealers would then use their sales records to trace down buyers of their car and distribute the questionnaire.

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b. Mega Cable TV operates in the Klang valley, receives signals via satellite from subscription STV and transmits a UHF signal over the air from a local facility. It broadcasts feature movies through a scrambled TV signal. It begins broadcast at 7 p.m. on weekdays and 1 p.m. on weekends and ends transmission at 4 a.m. daily. It has a customer base of approximately 8000 homes. It plans to conduct a survey to identify the demographics of its subscribers and to determine their satisfaction with its program selections.

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- i. What survey design (data collection method) should Mega use? Why?
- ii. What sample design should it use? Why?

[30 marks]

# SECTION B.

3. A researcher for an airline magazine wishes to find how three airlines rates against each other. Three airlines were chosen and 20 passengers, 10 each from 1st class and economy class, were randomly selected for each airline. Rating by passengers were made on a scale of 1 to 100 with 100 being the best. Results from a two-way ANOVA and Means are as follows.

Source	d.f.	Sum of squares	Mean square	F-value	p-value
Airline	2	11644.033	5822.017	39.178	.0001
Class	1	3182.817	3182.817	21.418	.0001
Airline * Class	2	517.033	258.517	1.740	.1853
Residual	54	8024.700	148.606		

#### Summary table for a 2-way ANOVA

	Count	Mean	Std. Dev.	Std. Error	
SMA Economy	10	35.60	12.140	3.839	
SMA First Class	10	42.30	15.550	4.917	
Caty Economy	10	48.50	12.501	3.953	
Caty First Class	10	69.30	9.166	2.898	
AIS Economy	10	64.80	13.037	4.123	
AIS First Class	10	81.00	9.603	3.037	

Means Table Effect: Airline \* Class

- a. What conclusions can you draw from the above results?
- b. If you are to do a separate one-way ANOVA for ratings across airlines and another across Class you may get the same conclusions. What is the advantage of using a two-way ANOVA as above instead of doing two separate 1-way ANOVA?
- c. Supposing you take a second rating from the same set of passengers a few weeks later, what test should you use to compare whether or not the second ratings differ significantly from the first ratings?

[20 marks]

- 4. The director of an MBA program has been reviewing grades of the students and is struck by the pattern in the data. His hunch is that certain types of people are involved in the study of management, and he decides to gather evidence for this idea. A random sample of 21 grade reports were chosen for students in the middle of the GPA range. Three steps were followed.
  - (i) A correlation matrix between grades for all pairs of the 10 courses for which data exist. A portion of it is shown in *Table 4.1* below.
  - (ii) Factor analysis was done using principal components analysis. The results are given in *Table 4.2*.
  - (iii) A varimax rotation was done on the factors to aid interpretation. Results are given in *Table 4.3*.

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Variable	Course	<b>V</b> 1	V2	V3	V10
V1	Financial accounting	1.00	.56	.17	01
V2	Managerial accounting	.56	1.00	22	.06
V3	Finance	.17	22	1.00	.42
V4	Marketing	14	.05	48	10
V5	Human behaviour	19	26	05	23
V6	Organisational design	21	00	56	05
V7	Production	44	11	04	08
V8	Probability	.30	.06	.07	10
V9	Statistical inference	05	.06	32	.06
V10	Quantitative analysis	01	.06	.42	1.00

Table 4.1: Correlation Coefficients

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Table 4.2: Factor matrix using Principal Component	or matrix using Principa	matrix using Principal Co	mponent
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Variable	Course	V1	V2	V3	Communality
V1	Financial accounting	.41	.71	.23	.73
V2	Managerial	.01	.53	16	.31
V3	accounting	.89	17	.37	.95
V4	Finance	60	.21	.30	.49
V5	Marketing	.02	24	22	.11
V6	Human behaviour	43	09	36	.32
V7	Organisational design	11	58	03	.35
V8	Production	.25	.25	31	.22
V9	Probability	43	.43	.50	.62
V10	Statistical inference	.25	.04	.35	.19
	Quantitative analysis				
		1.83	1.52	.95	
	Eigenvalue	18.30	15.20	9.50	
	Percent of Variance	18.30	33.50	43.0	

Variable	Course	Factor 1	Factor 2	Factor 3
V1	Financial accounting	.84	.16	06
V2	Managerial	.53	10	.14
V3	accounting	01	.90	37
V4	Finance	11	24	.65
<b>V</b> 5	Marketing	13	14	27
V6	Human behaviour	08	56	02
<b>V7</b>	Organisational design	54	11	22
<b>V8</b>	Production	.41	02	24
<b>V9</b>	Probability	.07	.02	.79
V10	Statistical inference Quantitative analysis	02	.42	.09

Table 4.3: Varimax Rotated Factor Matrix

a. How are the factor loadings interpreted?

b. What is the meaning of a communality of 0.31 found in Table 4.2?

c. How can you interpret the three factors obtained in Table 4.3?

[20 marks]

## SECTION C

- 5. For the case given in the appendix, answer the following.
- a. Evaluate the research design.
- b. Suggest improvements that could be made in the questionnaire.
- c. Identify the dependent and independent variables. Explain.
- d. Suggest two hypotheses that can be tested.
- e. What statistical techniques would be appropriate to test your two hypotheses?

[50 marks]

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## CASE OMAR'S FAST FREIGHT

Omar's Fast Freight, a regional truck transportation company, had eight offices and accompanying truck docks located in a four-state area. Trucks arrived daily with inbound freight that had to be unloaded onto the truck dock and then reloaded onto smaller trucks for city delivery. The process for outbound freight was similar: The city trucks picked up the local freight that had to be unloaded onto the truck dock and then loaded onto outbound trucks going to the other cities serviced by Omar's Fast Freight.

The nature of the transportation business required Omar's Fast Freight to operate its truck docks on a round-the-clock basis. Dock workers worked on a rotating shift basis. There were three shifts:

- Day (8:00 a.m. to 3:30 p.m.)
- · Evening (3:30 p.m. to midnight)
- Night (midnight to 8:00 a.m.)

Mr. Weslow, the personnel manager, had heard of some grumblings about shift work from the dock workers. He wanted to learn what the workers thought about working the rotating shift, so he decided to conduct a survey. The questionnaire used in his survey appears in Case Exhibit 1.

Mr. Weslow personally designed the questionnaire items concerning the rotating shift. He also thought it would be a good idea to ask some questions concerning job satisfaction. He went to the library to learn about this subject.

During his library research he found an apparently valid and reliable eight-question scale on identification with the work organization.<sup>1</sup> Because he didn't want to make the questionnaire too long, he selected only three of the best questions for inclusion in his survey.

Because Mr. Weslow also thought that some of the workers might be drinking on the job, he decided that some questions concerning the consumption of alcohol would be of value. He suspected that asking directly if workers drank on the job wouldn't get truthful answers. He disguised the questions by asking if individuals knew someone else who frequently consumes alcohol on the job.

Mr. Weslow wanted to impress the workers that it was important to complete the questionnaire. Therefore he personally handed out the questionnaires at the end of the evening and night shifts, asking the workers to return them the following day. EXHIBIT 1

				QUESTIONNAIRE		
1.	What part Day Evening Night	of your rotatin	g shift are you workin	ng this week? Please ch	eck below.	
2.	Compared as a husb job that da	to working ste and (accompar ay?	ady days, do you fee nying wife in her activ	el that shift work is in co ities, protecting her at l	onflict with your activitie home, etc.) such that y	es and responsibilities you decide not to go or
	Evening:	Very often	Often	Occasiona	ally Rare	Neve
	Night:	Very often	Often	Occasiona	ally Rare	ely Neve
3.	Compared the compa that you d	f to working ste any of your frie ecide not to go	eady days, do you fee nds, attending weddir on job that day?	el that shift work is in con ngs, reunions of family	onflict with your activitie and/or friends, and oth	es as a friend (enjoying er get-togethers) such
	Evening:	Very often	Often	Occasiona	ally Rare	aly Neve
	Night:	Very often	Often	Occasiona	ally Rare	ety Neve
4.	Compared as a fathe you decide	I to working ste r (teaching you a not to go on j	eady days, do you fee ir children, spending t ob that day?	el that shift work is in co time with them, taking t	nflict with your activitie hem to children's prog	es and responsibilities rams, etc.) such that
	Evening:	Very often	Often	Occasiona	ally Rare	ely Neve
	Night:	Very often	Often	Occasiona	ally Rare	aly Nev
5.	Compared cial organi	to working ste zations (attend	eady days, do you fee ling meetings, sports	el that shift work is in co events, etc.) such that	onflict with your activitie you decide not to go o	es as a member of so- on job that day?
	Evening:	Very often	Often	Occasiona	ally Rare	ely Neve
	Night:	Very often	Often	Occasiona	ally Rare	Neve
	Psycholog Physical:	nical: related to related to your	your esteem, status health and bodily fun	ego, anxiety over shift ctions.	work, etc.	
Ir	itice second	so and 7 two s	this workers are expri	essing their views about	it shift work. Head both	h views, evaluate you
lr os	ition regard	ling them, and	then check the appro	essing their views about opriate box.	It shiit work. Head both	n views, evaluate you
lr os	ition regard	ding them, and	then check the appro	opriate box.	Dick	h views, evaluate you
1r os 6.	Shift w out of our vis of grov am a p divorce way to be mo	orkers are not mind of manag ibility to manag with. Working in bart of a rotatin ad of my status show my diss. re and more at	Tom only out of sight but a ement. In shifts we lo gement and thus char shifts makes me fee g machine and comp is as a social being. O atisfaction with shifts issent.	also briate box. also bse bces l that I letely ne is to being and re Shift s such in my comp.	Dick Dick Tork is always visible to constantly evaluated. Egularity improve our c staff is very important t enjoys a special status job for my good and fo any.	o our assessors and Good performance thances of growth. to the plant and as s. I try to be regular or the good of the
1r os 6.	Shift w out of our vis of grov am a p divorce way to be mo	orkers are not mind of manag ibility to manag with. Working in bart of a rotatin show my diss. show my diss. re and more at	Tom only out of sight but a ement. In shifts we lo gement and thus chan shifts makes me fee g machine and comp as a social being. O atisfaction with shifts osent.	also briate box. also bse bces l that I letely is to Dur w being and re Shift s such in my comp.	Dick Dick Tork is always visible to constantly evaluated. Egularity improve our c staff is very important t enjoys a special status job for my good and fo any.	o our assessors and Good performance thances of growth. to the plant and as s. I try to be regular or the good of the

(continued)

·.	Bob Shift work offers more problems than it solves. It is damaging rather than adding to our social status. On occasions (for example, at a party) I do not like people to know that I have an abnor- mal life routine. On such occasions I prefer skip- ping the job to show that shifts are no limitations on my social life.				Pat I like shift work. It facilitates me more than it hin- ders my activities. Although it makes life routine somewhat abnormal, people have a clear recognition and appreciation of the contribution we are making to national growth. As such 1 am not facing any psychological problems in shift work.			
				ves. It I li al de rty) I so bnor- re r skip- wr ations no wr				
	Check	one box:		[				
	l am lii	ke Bob.	l am more like Bob than Pat.	I am halfway between Bob and Pat.	l am n like Pa Bob.	nore al than	l am like Pat.	
8.	Compared not to go o	d to working si on job that day	teady days, how often y?	does getting prope	er sleep or rest	become so diff	icult that you decid	
	Evening:	Very often	Often	Occa	sionally	Rarely	Neve	
•	Night:	very often	Offen	Occas	sionally	Harely	Neve	
	(stomach						,	
	go on job	that day?	el problems, loss of app	etite) and physical	I disturbance is	so severe that	you decide not to	
	go on job Evening:	Very often	Often	oetite) and physical Occa	I disturbance is sionally	so severe that Rarely	you decide not to	
10.	go on job Evening: Night: How muc	Very often Very often Very often	often Often Often 9 you with your work so	etite) and physica Occa Occa chedule, that is, wi	I disturbance is sionally sionally th the present a	so severe that Rarely Rarely arrangement of	you decide not to Neve Neve your hours for work	
10.	go on job Evening: Night: How muc Check or Check or If you co choose ( (1) (2) (3) (4) (5)	Upsets, bowe that day? <u>Very often</u> Very often th satislied ard the. Completely s Very well sati I do not care Dissatislied ard Very dissatis uld begin word Dmar's as a pl Definitely Probably of Definitely Definitely Definitely Definitely	Often Often Often a you with your work so atisfied with my schedu isfied. what my working hours a little. fied with my schedule. king over again in the s lace to work? Check or would choose another would choose Omar's would choose Omar's	etite) and physica Occa Occa Chedule, that is, witule. s are. same occupation the place over Omar's place over Omar's place over Omar's or som over another place	I disturbance is sionally isionally th the present a nat you are in n s. e other place.	so severe that Rarely Rarely arrangement of ow, how likely v	you decide not to Neve your hours for work	
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14.	Yes No
15.	If yes, do you ever worry about your safety? Always Sometimes Never
16.	How would you try to deal with employees drinking on the job?
17.	In your opinion, which one of these suggestions would be most appropriate for dealing with the situation? Employees should not be permitted to leave the plant during lunch break unless authorized More employee awareness through educational programs Adoption of stricter rules in dealing with the problem.
18.	How satisfied are you with your earnings?
19.	What is your age?
20.	

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