Uva Wellassa University, Sri Lanka
Faculty of Science & Technology
1st Semester Examination February/March 2012
IIT 475-2 Research Methodology

Uva Wellassa University

Time Allowed: **Two(02) hours**

Answer **All Five (05)** questions
Each question carries **equal marks**

Q1. Scientific method is a process used to find answers to questions about the universe using observations and investigations.

a. List the steps involved in Scientific Method and explain each.
b. Explain the two main approaches (strategies) used for conducting research. Discuss their advantages and/or disadvantages.
c. Discuss two practical examples for the above strategies in (b.) separately.
d. Briefly explain the incorporation of these two strategies.

(20 marks)

Q2. Quantitative Research is a kind of investigation about a certain phenomenon based on mathematical or statistical techniques.

a. Explain Quantitative Research.
b. List and briefly explain the sequence of actions found in Quantitative Research by using an appropriate approach.
c. Explain "Quantification of Qualitative Variables and Concepts" using examples.
d. What is the purpose of "Scaling" in research? Explain the popular types of scales used in research with relevant examples.

(20 marks)

Q3. Research Process is a sequential process where several steps are involved.

a. Identify the different stages of a Research Process and list the steps involved under each stage.
b. What do you mean by "Literature Review"? List the purpose of the Literature Review.
c. From the steps you listed in (a.) at which steps is the Literature Review important?
d. Briefly explain the main sources of literature for scientific research.

(20 marks)

Q4. Consider the following Rainfall Data for January (X) and May (Y), gathered from twenty (20) selected Meteorological Stations.

STATION ID	JANUARY (X)	MAY (Y)	$X - \bar{X}$	$Y - \bar{Y}$	$(X - \bar{X})(Y - \bar{Y})$
1	**37.0**	**194.0**	-36.95	90.88	-3358.02
2	**254.7**	**71.4**	180.75	-31.72	-5733.39
3	**62.3**	**434.3**	-11.65	331.18	-3858.25
4	**26.3**	**156.1**	-47.65	52.98	-2524.50
5	**2.0**	**48.0**	-71.95	-55.12	3965.88
6	**14.9**	**36.6**	-59.05	-66.52	3928.01
7	**79.5**	**154.0**	5.55	50.88	282.38
8	**7.5**	**20.7**	-66.45	-82.42	5476.81
9	**236.0**	**0.0**	162.05	-103.12	-16710.60
10	**10.9**	**26.4**	-63.05	-76.72	4837.20
11	**173.0**	**103.4**	99.05	0.28	27.73
12	**17.8**	**8.9**	-56.15	-94.22	5290.45
13	**227.1**	**61.2**	153.15	-41.92	-6420.05
14	**100.0**	**309.0**	26.05	205.88	5363.17
15	**166.6**	**19.0**	92.65	-84.12	-7793.72
16	**5.7**	**105.6**	-68.25	2.48	-169.26
17	**19.2**	**142.2**	-54.75	39.08	-2139.63
18	**8.8**	**35.2**	-65.15	-67.92	4424.99
19	**0.0**	**10.9**	-73.95	-92.22	6819.67
20	**29.7**	**125.5**	-44.25	22.38	-990.32

Given that;

Correlation Coefficient $\mathbf{r = [\sum(x - \bar{x})(y - \bar{y})]/ (n-1) S_x S_y}$

Where,

X and **Y** are two variables (Rainfall data for January and May respectively)

$\bar{X}$ and $\bar{Y}$ are the mean values of each variable X and Y respectively

n is the number of observations

S_x and S_y are standard deviation of each variable

$\sum(x - \bar{x})(y - \bar{y}) = -9281.42$

$S_x = 87.30$

$S_y = 110.11$

$\sum x = 1479$

$\sum y = 2062.4$

a. Calculate the Correlation Coefficient (r) between X and Y.

b. Sketch the shape of the expected graph and interpret the result calculated in (a.). [hint: Think of Rainy Seasons, North East and South West monsoons, in Sri Lanka]

c. What are the three factors which determine the Sample Size? Briefly explain each.

d. Discuss the importance of determining the Sample Size considering Dispersed and Homogeneous Populations. (You can use an example to justify your discussion)

(20 marks)

Q5.

a. "Academic writing is different from other form of writings". Critically discuss your idea about the statement. (Limit your discussion to 250 words)

b. What is the importance of an Academic Writing or a Thesis of a research?

c. What are the Three (03) main parts of a Thesis? Explain each.

d. Write a short note about each of the following sections related to the Thesis.

   i) Abstract

   ii) Discussion

   iii) Appendices

(20 marks)

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