Gratia Christian College
宏恩基督教學院

Course code & title	:	PY1103 Introduction to Statistics
Session	:	
Time allowed	:	2 Hours

This paper has 10 pages (including this cover page).

1. This paper consists of 34 questions in 2 sections.

2. Answer **ALL** questions in both Section A and B.

3. Answers to Section A should be marked on the Multiple-Choice Answer Sheet while answers to Section B should be written in the Answer Book. In the Answer Book, start **EACH** question (not part of a question) on a **NEW** page.

This is a **closed-book** examination.

Candidates are allowed to use the following materials/aids:

- Noiseless and cordless calculators without communication function.

Materials/aids other than those stated above are not permitted. Candidates will be subject to disciplinary action if any unauthorized materials or aids are found on them.

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO.

(A) Multiple Choice (Answer ALL questions) (30 marks, each question carries one mark). Please choose the correct answer for each question and mark on the multiple choice sheet provided.   There is only ONE correct answer for every question:

(B) Short Answer (This section contains 4 (multi-part) short answer questions. Answer <u>all</u> questions. Please provide answers in the script book provided. The total mark for this section is 40 marks, each question is worth 10 marks. Marks for each subsection of the questions are indicated on the exam paper:

Question 1 (10 marks)

A researcher was interested in the relationship between social support and depression. She conducted a survey measuring participants' levels of social support and their level of depression. From the data, she calculated Pearson's product moment correlation coefficient (Pearson's r) to examine the relationship between the two variables. The SPSS output for her analysis is presented below:

Correlations

		social support	depression
social support	Pearson Correlation	1	-.440(*)
	Sig. (2-tailed)		.047
	N	184	184
depression	Pearson Correlation	-.440(*)	1
	Sig. (2-tailed)	.047	
	N	184	184

a) Write the null and alternative hypotheses for this analysis. (2 marks)

b) Using the information in the table report:
    i)   the direction of the relationship (1 mark)
    ii) the value of the correlation coefficient (1 mark)
    iii) the probability (p) value (1 mark)
    iv) whether the relationship is statistically significant (1 mark)

c) By using .05 as cut-off value, what would you conclude with respect to the null hypothesis? (1 mark)

d) Based on her results, the researcher argues that to reduce depression in the community we first need to work on improving social support. State (i) what is wrong with this argument (1 mark), and (ii) provide a plausible alternative explanation for the finding – could there be another variable involved? (2 marks).

8

Question 2 (10 marks)

A researcher has handed out a survey that asks people to report their age and how many close friends they have. Eleven people return the survey and their scores are given in Table 1.

Table 1. Reported age and number of close friends.

Age (years)	Number of Close Friends
29	6
25	7
18	3
24	5
21	6
31	7
22	4
18	2
29	6
23	6
35	7

For the scores on the Number of Close Friends variable ONLY:

a) Report the mean. (2 marks)

b) Report the median. (2 marks)

c) Report the mode. (1 mark)

d) Report the range. (1 mark)

e) Plot the scores of both Age and Number of Close Friends using a scatterplot. (3 marks)

f) Report the direction of the relationship between Age and Number of Close Friends. (1 mark)

Question 3 (10 marks)

Previous research in the UK has demonstrated that, upon waking up on an average weekday morning, 50% of people turn the TV on, 25% turn the radio on, and 25% have no form of entertainment switched on. Professor Gosling wants to know if behaviours are different among Australians. He conducts a poll asking 200 Australians what entertainment they favour first thing in the morning. He finds that 79 report turning on the TV, 22 turn on the radio, and 99 do not put on any form of entertainment.

a) What is H_0 in regards to this analysis? (1 mark)

b) What are the expected frequencies for this study, based on the assumption that the pattern in the Australian data will be the same as the UK data? (2 marks)

c) What specific test would you use to analyse the data? (2 marks)

d) Write down the formula you would use to calculate the test statistic. (1 mark)

e) Write down TWO assumptions or limitations of using this analysis type AND why they are addressed in this particular analysis. (4 marks)

Question 4 (10 marks)

Design a study to evaluate the theory that people who have a messy house are less likely to be happy. In particular specify or describe:

(a) the null and alternative hypotheses (2 marks)

(b) the type of study (experiment, survey, etc.) (2 marks)

(c) the IV and DV – be specific (2 marks)

(d) the type of statistical analysis (2 marks) and

(e) other explanatory variables that would need to be considered when interpreting the results (2 marks).

END