EE3211 Final Exam Section B

Start Assignment

Due May 8 by 12:30pm **Points** 40 **Submitting** a file upload **Attempts** 0
Allowed Attempts 1 **Available** May 8 at 9:30am - May 8 at 12:30pm about 3 hours

Instructions:

Please make sure you follow all instructions from the University, ARRO, and EE. Please note the following:

1. Please refer to the “quizzes” section of your Canvas account for Section A. There are 30 questions. This section (Section B) consists of **TWO** The questions are ALL compulsory. Make sure that you attempt all of them. The total score is 70.
2. This is an **open-book** Students can read the lecture notes and/or other materials available online.
3. You are responsible for receiving the questions on Canvas (Section A: Quizzes; Section B: Assignment), attempt all questions in the quizzes for Section A. For Section B, hand-write all answers on blank answer sheets, compile the answers into a single PDF file, and **upload the file before the deadline** of the exam.
4. **On the first page of your answer sheets,** copy the following sentence and sign it: *I pledge to follow the Rules on Academic Honesty and understand that violations may lead to severe penalties. (*Signature) _____ (Date) _____

Answering this exam paper implies your acknowledgment of the Pledge for following the Rules on Academic Honesty:

“I pledge that the answers in this examination are my own and that I will not seek or obtain an unfair advantage in producing these answers. Specifically,

1. I will not plagiarize (copy without citation) from any source;

2. I will not communicate or attempt to communicate with any other person during the examination; neither will I give or attempt to give assistance to another student taking the examination; and

3. I will use only approved devices (e.g., calculators) and/or approved device models.

4. I understand that any act of academic dishonesty can lead to disciplinary action.”

Contact Information

- Should you have any technical problem during the exam, contact your course leader or invigilator via Zoom private chat, email: kkhchan@cityu.edu.hk (mailto:kkhchan@cityu.edu.hk) / rxhuang4-c@my.cityu.edu.hk (rxhuang4-c@my.cityu.edu.hk) or by phone call at 3442 6661.
- If you are not able to contact course leader/invigilator, you can reach the department via:
- Departmental hotline at (+852) 3442-7740
- Department Whatsapp phone: 9269-4066
- Department WeChat ID: wxid_lly7yf5fzoj722 or scan the following QR Code

SECTION A (30 points)

Please refer to the “quizzes” section of your Canvas account.

SECTION B (40 points)

Q1. (20 points)

Two drugs (A, B) are compared for the medical treatment of duodenal ulcer. For this purpose, patients are carefully matched with regard to age, gender, and clinical condition. The treatment results based on 200 matched pairs show that for 89 matched pairs both treatments are effective; for 90 matched pairs both treatments are ineffective; for 5 matched pairs drug A is effective, whereas drug B is ineffective; and for 16 matched pairs drug B is effective, whereas drug A is ineffective.

a. What test procedure can be used to assess the results? (4 points)

b. Perform the test in a., report a p-value and provide interpretation/conclusion. (6 points)

In the same study, if the focus is on the 100 matched pairs consisting of male patients, then the following results are obtained: for 52 matched pairs both drugs are effective; for 35 matched pairs both drugs are ineffective; for 4 matched pairs drug A is effective; whereas drug B is ineffective; and for 9 matched pairs drug B is effective, whereas drug A is ineffective.

c. How many concordant pairs are there among the male matched pairs? (2 point)

d. How many discordant pairs are there among the male matched pairs? (2 point)

e. Perform a significance test to assess any differences in effectiveness between the drugs among males. Report a p-value and provide interpretation/conclusion. (6 points)

Q2. (20 points)

An instrument that is used in some blood-pressure studies is the random-zero device, in which the zero point of the machine is randomly set with each use and the observer is not aware of the actual level of blood pressure at the time of measurement. This instrument is intended to reduce observer

bias. Before using such a machine, it is important to check that readings are, on average, comparable to those of a standard cuff. For this purpose, two measurements were made on 20 children with both the standard cuff and the random-zero machine. The mean systolic blood pressure (SBP) for the two readings for each machine are given in the table below. Suppose observers are reluctant to assume that the distribution of blood pressure is normal. Random zero readings should be subtracted from the standard cuff readings.

Table. Comparison of mean SBP with the standard cuff vs. the random-zero machine (mm Hg)

Person	Mean SBP (standard cuff)	Mean SBP (random-zero)
1	79	84
2	112	99
3	103	92
4	104	103
5	94	94
6	106	106
7	103	97
8	97	108
9	88	77
10	113	94
11	98	97
12	103	103
13	105	107
14	117	120
15	94	94
16	88	87
17	101	97
18	98	93
19	91	87
20	105	104

a. Which nonparametric test should be used to test the hypothesis that the mean SBPs for the two machines are comparable? (4 points)

b. Conduct the test in a. (12 points) What is your conclusion? (4 points)