國立政治大學 113 學年度第 1 學期 Midterm Exam 考試命題紙

Subject： 統計學 (一) 開課班別： 統計學整合開課 Teacher: Han-Ming Wu

Date：14 Nov. (Thur) 13:10-14:50	※Allowed:「O」, Prohibited:「×」				1. 需加發計算紙或答案紙請在試題內封袋備註。 2. 為環保節能減碳，試題一律採雙面印刷，如有特殊印製需求，請註記：
Pages: 3，Copies: 50	Calculator	Textbook	Class notes	3C product	
Scope: §ch1-4	O	×	×	×	

Notes:

(1) Fill in the student ID number and name on the answer sheet。

(2) Answer all questions in English (ignore the grammar and spelling)。

(3) Answer each question in the order it appears。The total score is 120.

(4) It is recommended to use a dark ballpoint pen。(pencil is allowed)

(5) The calculation process (for parts **IV** and **V**) is required (calculate to 4 decimal places)。

(6) Return both the answer sheet and the question sheet.

(-) Declaration (0%): Please transcribe the following oath onto the first page of the answer sheet in either Chinese or English. (複寫下列宣誓詞至答案卷的第一頁上)。(10 points will be deducted if not written.)(不寫扣 10 分)

0. " 本人姓名 恪遵各項考試規則，若如違反，願受校方最嚴厲處罰，謹誓。"

"I (your name here) will strictly adhere to all examination rules. If I break this oath, I am willing to accept the most severe punishment imposed by the school. Solemnly sworn."

(I) Multiple choice (20%, 5% each); select one correct answer.

1. The flashlight batteries produced by one of the northern manufacturers are known to have an average life of 60 hours with a standard deviation of 4 hours. At least what percentage of flashlights will have a life of 54 to 66 hours? (A). 56%. (B). 60%. (C). 64%. (D). 68%.

2. Consider a sample with the following data values: 62, 90, 50, 94, 74. Compute the Z scores for the above five observations. What is the mean of these Z scores? (A). -1. (B). 0. (C). 0.5. (D). 1 .

3. If X and Y are mutually exclusive events with $P(A) = 0.295$, $P(B) = 0.32$, then $P(A|B) =$
(A). 0.0944. (B). 0.6150. (C). 1.0000. (D). 0.0000.

4. If $P(A \cap B) = 0$, (A). $P(A) + P(B) = 1$. (B). either $P(A) = 0$ or $P(B) = 0$. (C). A and B are mutually exclusive events. (D). A and B are independent events.

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本試題共3頁，印刷份數: 50 份	計算機	課本	筆記	字典	手機平板筆電	
備註：注意事項要看!! (Scope: §ch1-4)	O	×	×	×	×	

(II) Fill-in-the-blank (Correct spelling should be used if possible.) (20%, 10% each)

5. The following frequency distribution shows the time (in minutes) that a sample of students uses the computer terminals per day. Compute the mean. _____.

Time:	20 – 39	40 – 59	60 – 79	80 – 99	100 – 119
Frequency:	2	4	6	4	2

6. The results of a survey of 800 married couples and the number of children they had is shown below.

Number of Children:	0	1	2	3	4	5
Probability:	0.050	0.125	0.600	0.150	0.050	0.025

If a couple is selected at random, what is the probability that the couple will have Either 2 or 3 children? _____.

(III) Short answer (20%, 10% each)(write down the statement (or definition), formula if any, interpretation)

7. What is the so-called "joint probability"?

8. What is the "Bayes' theorem"? (formula is required.)

(IV) Calculation (40%, 20% each)

9. **Intent to Pursue MBA.** Students taking the Graduate Management Admissions Test (GMAT) were asked about their undergraduate major and intent to pursue their MBA as a full-time or part-time student. A summary of their responses follows.

		Undergraduate Major			
		Business	Engineering	Other	Totals
Intended Enrollment Status	Full-Time	352	197	251	800
	Part-Time	150	161	194	505
	Totals	502	358	445	1305

Are the event that the student intends to attend classes full-time in pursuit of an MBA degree, and the event that the student was an undergraduate business major independent? Justify your answer.

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10. **Consulting Firm Bids.** A consulting firm submitted a bid for a large research project. The firm's management initially felt they had a 50–50 chance of getting the project. However, the agency to which the bid was submitted subsequently requested additional information on the bid. Past experience indicates that for 75% of the successful bids and 40% of the unsuccessful bids the agency requested additional information. Compute the posterior probability that the bid will be successful given a request for additional information.

(V) Bonus (20%, 5%each)

11. (a) If $P(A) = 0.4$, $P(B|A) = 0.35$, $P(A \cup B) = 0.69$, then $P(B) =$ _____.
    (b) If $P(A) = 0.50$, $P(B) = 0.40$ and $P(A \cup B) = 0.88$, then $P(B|A) =$ _____.
    (c) If $P(A_1) = 0.40$, $P(A_2) = 0.60$ and $P(A_1 \cap A_2) = 0$. Suppose $P(B|A_1) = 0.20$ and $P(B|A_2) = 0.05$, Then $P(A_1 \cap B) =$ _____.
    (d) (same as above) $P(A_2|B) =$ _____.

<The blank pages at the back can be used as scratch paper. (後面空白頁可當計算紙)>

注意： 1、考試求公平及公正，請同學務必自律，維護學校與學生之榮譽。
2、考試時不得有交談、窺視、夾帶、抄襲、傳遞、代考或其它作弊等舞弊行為，考畢務必交卷，不得攜卷出場，違者依考場規則議處。