

國立政治大學 113 學年度第 1 學期 Quiz (2) 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 : 26 Dec. (Thur) 15:00-16:00

※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: §ch5-6

O

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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. For a continuous random variable X , the height of the function at $X = x$ is (A). the probability at a given value of x . (B). named the probability density function $f(x)$. (C). 0.50, since it is the middle value. (D). a value less than zero.
2. Random variable X has the probability function $f(x) = x/6$, for $x = 1, 2$ or 3 . The expected value of X is (A). 0.500. (B). 2.000. (C). 2.333. (D). 2.5
3. 20. For any continuous random variable, the probability that the random variable takes on exactly a specific value is (A). 1.00. (B). 0.50. (C). any value between 0 to 1. (D). 0.
4. Which of the following is not a characteristic of an experiment where the binomial probability distribution is applicable? (A). The experiment has a sequence of n identical trials. (B). Exactly two outcomes are possible on each trial. (C). The experiment is independent. (D). The probabilities of the outcomes do not change from one trial to another.

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命題教授: Han-Ming Wu

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※准帶項目打「O」· 否則打「×」

1. 需加發計算紙或答案紙請在試題內封袋備註。

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
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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：

備註：注意事項要看!! (Scope: §ch5-6)

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

- The expected value is a _____ of the values of the discrete random variable where the weights are the probabilities.
- In "Normal Approximation of Binomial Probabilities", the 0.5 that we add and subtract from x is called a _____.

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

- What is the "probability distribution" for a random variable? (in discrete case)
- What is the "Normal Approximation of Binomial Probabilities?" (You SHOULD NOT just answer: "use normal to approximate binomial." nor "use normal probabilities to approximate binomial probabilities.")

(IV) Calculation (40%)

- Visitors to Rocky Mountain National Park.** Rocky Mountain National Park is a popular park for outdoor recreation activities in Colorado. According to U.S. National Park Service statistics, 46.7% of visitors to Rocky Mountain National Park in 2018 entered through the Beaver Meadows park entrance, 24.3% of visitors entered through the Fall River park entrance, 6.3% of visitors entered through the Grand Lake park entrance, and 22.7% of visitors had no recorded point of entry to the park. Consider a random sample of 175 Rocky Mountain National Park visitors.
 - What is the probability that at least 70 but less than 80 visitors had a recorded entry through the Beaver Meadows park entrance?
 - What is the probability that more than 45 visitors have no recorded point of entry?

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備註：注意事項要看!! (Scope: §ch5-6)

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(V) Bonus (20%)

10. (20%) **Canadian Restaurant Ratings.** The Chamber of Commerce in a Canadian city has conducted an evaluation of 300 restaurants in its metropolitan area. Each restaurant received a rating on a 3point scale on typical meal price (1 least expensive to 3 most expensive) and quality (1 lowest quality to 3 greatest quality). A crosstabulation of the rating data is shown below. Fortytwo of the restaurants received a rating of 1 on quality and 1 on meal price, 39 of the restaurants received a rating of 1 on quality and 2 on meal price, and so on. Fortyeight of the restaurants received the highest rating of 3 on both quality and meal price.

Quality (x)	Meal Price (y)			Total
	1	2	3	
1	42	39	3	84
2	33	63	54	150
3	3	15	48	66
Total	78	117	105	300

Compute the correlation coefficient between quality and meal price.

機率表

Lower tail probability: $Z \sim N(0, 1), P(Z \leq z) = p.$

z	-1.85	-1.78	-1.7	-0.34	-0.26	-0.19	0.86	0.95	1.04
p	0.0322	0.0375	0.0446	0.3669	0.3974	0.4247	0.8051	0.8289	0.8508

<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。