國立政治大學 114 學年度第 1 學期 小考 (2) 考試命題紙

考試科目： 統計學 (一)　　開課班別： 統計學整合開課　　命題教授: 吳漢銘

考試日期：11/25(二)14:50-16:00	※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。 2. 為環保節能減碳，試題一律採雙面印刷，有特殊印製需求，請註記：A 卷
本試題共3頁，印刷份數: 86 份	計算機	課本	筆記	字典	手機平板筆電	
備註：注意事項要看!! (ch5.6~7.5)	O	×	×	×	×	

注意事項:

(1) 在答題紙上填寫學號和姓名。請在答題紙右上角標明你使用的試卷編號：**A**（預設）或 **B**。

(2) 所有問題可用中文或英文作答（無需考慮語法和拼寫）。

(3) 請按題號順序作答。總分為 120 分。

(4) 建議使用深色原子筆（允許使用鉛筆）。禁用手機 3C 產品。可使用計算機 (無程式功能)。

(5) 計算過程（**IV** 和 **V** 部分）必須寫出（計算至小數點後 4 位。若最後答案包含 $e, \pi, \log$ 等，可不用展開計算）。

(6) 答題紙與試題卷須一併交回。

(7) 作弊學生當次及日後考試試卷將不予批改，情節嚴重將報校處理。

(-) 宣誓詞 (0%): 複寫下列宣誓詞至答案卷的第一頁上。(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) 選擇題 (30%; 10% each); select one correct answer.

1. (10%) Consider a Poisson distribution with a mean of two occurrences per time period. Compute the probability of six occurrences in three time periods. (A). 0.1606. (B). 0.0504. (C) 0.0120. (D). 0.0005

2. (10%) For a continuous random variable X, the probability density function $f(x)$ represents the (A). probability at a given value of x. (B). area under the curve at x. (C). area under the curve to the right of x. (D). height of the function at x.

3. (10%) The sampling error is the (A). same as the standard error of the mean. (B). difference between the value of the sample mean and the value of the population mean. (C). error caused by selecting a bad sample. (D). standard deviation multiplied by the sample size.

國立政治大學 114 學年度第 1 學期 小考 (2) 考試命題紙

考試科目： 統計學 (一) 開課班別： 統計學整合開課 命題教授: 吳漢銘

考試日期：11/25(二)14:50-16:00	※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。 2. 為環保節能減碳，試題一律採雙面印刷，有特殊印製需求，請註記：A 卷
本試題共3頁，印刷份數: 86 份	計算機	課本	筆記	字典	手機平板筆電	
備註：注意事項要看!! (ch5.6~7.5)	O	×	×	×	×	

(II) 填空題 (Correct spelling should be used.) (20%, 10% each)

4. The _____ of any particular sample statistic is called the sampling distribution of the statistic.

5. In selecting random samples of size n from a population, the sampling distribution of the _____ can be approximated by a normal distribution as the sample size becomes large. This concept is known as the _____.

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

6. What is the important role of the probability distributions?

7. A sample statistic, such as the sample mean ($x\bar{x}$), is related to a population parameter, such as the population mean (μ). Describe this relationship by explaining what the statistic is used for and why it is not always exactly equal to the parameter.

(IV) 計算題 (30%, 15% each)

8. **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 (U.S. National Park Service website). Consider a random sample of 175 Rocky Mountain National Park visitors. Use the normal approximation of the binomial distribution to answer the following questions.

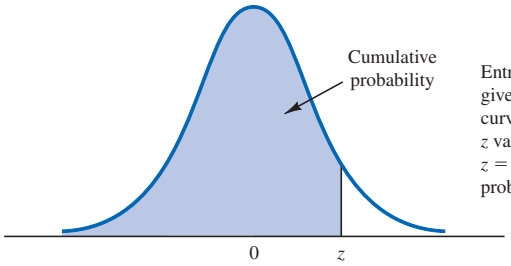
   (a) What is the probability that at least 70 but less than 80 visitors had a recorded entry through the Beaver Meadows park entrance?

   (b) What is the probability that more than 45 visitors have no recorded point of entry?

(V) 加分題 (20%)

9. Please describe the relationship between the Poisson and exponential distributions.

TABLE 1 Cumulative Probabilities for the standard Normal Distribution (*Continued*)



Entries in the table give the area under the curve to the left of the z value. For example, for $z = 1.25$, the cumulative probability is .8944.

z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
.0	.5000	.5040	.5080	.5120	.5160	.5199	.5239	.5279	.5319	.5359
.1	.5398	.5438	.5478	.5517	.5557	.5596	.5636	.5675	.5714	.5753
.2	.5793	.5832	.5871	.5910	.5948	.5987	.6026	.6064	.6103	.6141
.3	.6179	.6217	.6255	.6293	.6331	.6368	.6406	.6443	.6480	.6517
.4	.6554	.6591	.6628	.6664	.6700	.6736	.6772	.6808	.6844	.6879
.5	.6915	.6950	.6985	.7019	.7054	.7088	.7123	.7157	.7190	.7224
.6	.7257	.7291	.7324	.7357	.7389	.7422	.7454	.7486	.7517	.7549
.7	.7580	.7611	.7642	.7673	.7704	.7734	.7764	.7794	.7823	.7852
.8	.7881	.7910	.7939	.7967	.7995	.8023	.8051	.8078	.8106	.8133
.9	.8159	.8186	.8212	.8238	.8264	.8289	.8315	.8340	.8365	.8389
1.0	.8413	.8438	.8461	.8485	.8508	.8531	.8554	.8577	.8599	.8621
1.1	.8643	.8665	.8686	.8708	.8729	.8749	.8770	.8790	.8810	.8830
1.2	.8849	.8869	.8888	.8907	.8925	.8944	.8962	.8980	.8997	.9015
1.3	.9032	.9049	.9066	.9082	.9099	.9115	.9131	.9147	.9162	.9177
1.4	.9192	.9207	.9222	.9236	.9251	.9265	.9279	.9292	.9306	.9319
1.5	.9332	.9345	.9357	.9370	.9382	.9394	.9406	.9418	.9429	.9441
1.6	.9452	.9463	.9474	.9484	.9495	.9505	.9515	.9525	.9535	.9545
1.7	.9554	.9564	.9573	.9582	.9591	.9599	.9608	.9616	.9625	.9633
1.8	.9641	.9649	.9656	.9664	.9671	.9678	.9686	.9693	.9699	.9706
1.9	.9713	.9719	.9726	.9732	.9738	.9744	.9750	.9756	.9761	.9767
2.0	.9772	.9778	.9783	.9788	.9793	.9798	.9803	.9808	.9812	.9817
2.1	.9821	.9826	.9830	.9834	.9838	.9842	.9846	.9850	.9854	.9857
2.2	.9861	.9864	.9868	.9871	.9875	.9878	.9881	.9884	.9887	.9890
2.3	.9893	.9896	.9898	.9901	.9904	.9906	.9909	.9911	.9913	.9916
2.4	.9918	.9920	.9922	.9925	.9927	.9929	.9931	.9932	.9934	.9936
2.5	.9938	.9940	.9941	.9943	.9945	.9946	.9948	.9949	.9951	.9952
2.6	.9953	.9955	.9956	.9957	.9959	.9960	.9961	.9962	.9963	.9964
2.7	.9965	.9966	.9967	.9968	.9969	.9970	.9971	.9972	.9973	.9974
2.8	.9974	.9975	.9976	.9977	.9977	.9978	.9979	.9979	.9980	.9981
2.9	.9981	.9982	.9982	.9983	.9984	.9984	.9985	.9985	.9986	.9986
3.0	.9987	.9987	.9987	.9988	.9988	.9989	.9989	.9989	.9990	.9990