1. 若連續隨機變數X的機率分配函數如 $f(x) = \begin{cases} k(x-1), 1 < x < 2\\ 0, otherwise \end{cases}$ (A) $k = ? (5\%)$ (B) 期望值 $E(3X+1) = ? (5\%)$ 2. Let $\{X_1, X_2, X_3\}$ be a random sample obtained from the iid $N(u, \sigma^2)$ . Let the estimators $\hat{u}_1 = \frac{X_1 + X_2 + X_3}{3}, \hat{u}_2 = \frac{2X_1 + X_2 + X_3}{4}$ and $\hat{u}_3 = \frac{X_1 + 2X_2}{4}$ , then (A) Which estimator is an unbiased estimator? (5%) (B) Which estimator is more efficient? (10%)	考試	日期:12月3日(星期六) 第1節			本試	領共	9 <del>x</del>	、題,2	百
<ul> <li>(B) 期望值 E(3X+1)=? (5%)</li> <li>2. Let {X<sub>1</sub>, X<sub>2</sub>, X<sub>3</sub>} be a random sample obtained from the iid N(u, σ<sup>2</sup>). Let the estimators</li></ul>			如 $f(x) =$	$\begin{cases} k(x-1) \\ 0, \end{cases}$					
$\hat{u}_{1} = \frac{X_{1} + X_{2} + X_{3}}{3}, \hat{u}_{2} = \frac{2X_{1} + X_{2} + X_{3}}{4} \text{ and } \hat{u}_{3} = \frac{X_{1} + 2X_{2}}{4}, \text{ then}$ (A) Which estimator is an unbiased estimator? (5%) (B) Which estimator is more efficient? (10%) 3. 下表為民眾對市政府滿意程度之機率分配: (X表年齡層,Y表滿意分數:最低分 1 分; 最高分 5 分 ),試求: (A) <i>E</i> ( <i>Y</i> ) (5%) (B) <i>E</i> ( <i>XY</i> ) (10%) $\circ$ $\underbrace{\frac{X}{(2\sqrt{N})}, \frac{Y}{30}, \frac{1}{2}, \frac{2}{3}, \frac{4}{5}, \frac{8}{2}, \frac{8}{2}, \frac{1}{1}, \frac{2}{3}, \frac{3}{4}, \frac{5}{2}, \frac{8}{2}, \frac{8}{2}, \frac{1}{1}, \frac{2}{3}, \frac{3}{4}, \frac{5}{2}, \frac{8}{2}, \frac{1}{1}, \frac{1}{2}, \frac{2}{3}, \frac{4}{2}, \frac{5}{2}, \frac{8}{2}, \frac{1}{2}, \frac{1}{2}, \frac{1}{2}, \frac{2}{3}, \frac{4}{2}, \frac{5}{2}, \frac{8}{2}, \frac{1}{2}, \frac{1}{2},$	,								
(A) Which estimator is an unbiased estimator? (5%) (B) Which estimator is more efficient? (10%) 3. 下表為民眾對市政府滿意程度之機率分配: $(X 表年齡層, Y 表滿意分數: 最低分 1 分;$ 最高分 5 分 ),試求: (A) $E(Y)$ (5%) (B) $E(XY)$ (10%)。 $\boxed{\frac{X}{(\overline{X} + \overline{Y})} \frac{1}{2} \frac{2}{3} \frac{4}{5} \frac{8}{8} \frac{8}{10} \frac{1}{1} \frac{1}{(\overline{X} + \overline{X})} \frac{1}{(\overline{X} + $		-	• 				$\sigma^2$ ). Let	the esti	mators
(B) Which estimator is more efficient? (10%) 3. 下表為民眾對市政府滿意程度之機率分配: $(X表年齡層, Y表滿意分數: 最低分 1 分;$ 最高分 5 分 ),試求: (A) $E(Y)$ (5%) (B) $E(XY)$ (10%)。 $\frac{X}{Y} 1 2 3 4 5 總和$ 0 (表小於 30 歲) 0 0.05 0.15 0.2 0.1 0.5 1 (表大於、等於 30 歲) 0 0.1 0.2 0.2 0 0.5	û	$\hat{\mu}_1 = \frac{X_1 + X_2 + X_3}{3}, \hat{\mu}_2 = \frac{2X_1 + X_2 + X_3}{4}$	$\frac{X_3}{2}$ and	$\hat{u}_3 = \frac{X_1}{2}$	$\frac{+2X_2}{4}$ ,	then			
3. 下表為民眾對市政府滿意程度之機率分配:(X表年齡層,Y表滿意分數:最低分1分;         最高分5分),試求:(A) E(Y) (5%)       (B) E(XY) (10%)。 <u>X</u> <u>Y</u> <u>1</u> <u>2</u> <u>3</u> <u>4</u> <u>5</u> 總和 <u>0 (表小於 30 歲)</u> <u>0</u> <u>0</u> <u>0.15</u> <u>0.2</u> <u>0.1</u> <u>0.5</u> <u>1(表大於、等於 30 歲)</u> <u>0</u> <u>0</u> <u>0.1</u> <u>0.2</u> <u>0</u> <u>0.5</u> <u>0</u> <u>0</u> <u>0</u> <u>0</u> <u>0</u> <u>10</u> <u>2</u> <u>0</u> <u>0</u> <u>0</u> <u>0</u> <u>10</u> <u>2</u> <u>0</u> <u>10</u> <u>2</u> <u>0</u>				50()					
最高分 5 分 ), 試求: (A) <i>E</i> ( <i>Y</i> ) (5%) (B) <i>E</i> ( <i>XY</i> ) (10%)。 X Y 1 2 3 4 5 總和 0(表小於 30 歲) 0 0.05 0.15 0.2 0.1 0.5 1(表大於、等於 30 歲) 0 0.1 0.2 0.2 0 0.5	(7	A) Which estimator is an unbiased est	timator? (	5%)					
最高分 5 分 ), 試求: (A) <i>E</i> ( <i>Y</i> ) (5%) (B) <i>E</i> ( <i>XY</i> ) (10%)。 X Y 1 2 3 4 5 總和 0(表小於 30 歲) 0 0.05 0.15 0.2 0.1 0.5 1(表大於、等於 30 歲) 0 0.1 0.2 0.2 0 0.5				5%)					
XY12345總和0 (表小於 30 歲)00.050.150.20.10.51 (表大於、等於 30 歲)00.10.20.200.5	(E	3) Which estimator is more efficient?	(10%)		临室,1	/ 主、生之		旦瓜八 1	
A       0       0.05       0.15       0.2       0.1       0.5         1 (表大於、等於 30 歲)       0       0.1       0.2       0.2       0       0.5	(E 3. 下	3) Which estimator is more efficient? 不表為民眾對市政府滿意程度之機率	(10%) 率分配:(	(X表年)			〔分數:	最低分1	1分;
1(表大於、等於 30 歲) 0 0.1 0.2 0.2 0 0.5	(E 3. 下	3) Which estimator is more efficient? 不表為民眾對市政府滿意程度之機率	(10%) 率分配:(	(X表年)			〔分數: 	最低分 1	1分;
	(E 3. 下	<ul> <li>B) Which estimator is more efficient?</li> <li>表為民眾對市政府滿意程度之機率</li> <li>最高分5分),試求: (A) E(Y) (5%</li> </ul>	(10%) 率分配:(	(X表年)		•			1分;
總和 0 0.15 0.35 0.4 0.1	(E 3. ⊤	B) Which estimator is more efficient? 表為民眾對市政府滿意程度之機率 最高分 5 分 ),試求: (A) $E(Y)$ (5% X	×(10%) 率分配: (6) (B	(X表年) ) <i>E</i> (XY) 2	(10%)	° 4	5	總和	1分;
	(E 3. ⊤	B) Which estimator is more efficient?	×(10%) 和分配: 6) (B 1 0	(X表年) ) E(XY) 2 0.05	(10%) 3 0.15	。 4 0.2	5	總和 0.5	1分;
	(H 3. 下 最	B) Which estimator is more efficient? 表為民眾對市政府滿意程度之機率 最高分 5 分 ),試求: (A) $E(Y)$ (5% X 0 (表小於 30 歲) 1 (表大於、等於 30 歲) 總 和	¥分配: 6) (B 1 0 0 0	(X表年) ) <i>E</i> (XY) 2 0.05 0.1 0.15	<ul> <li>(10%)</li> <li>3</li> <li>0.15</li> <li>0.2</li> <li>0.35</li> </ul>	<ul> <li>4</li> <li>0.2</li> <li>0.2</li> <li>0.4</li> </ul>	5 0.1 0 0.1	總和 0.5 0.5	
1 7	(E 3. 下 最 4. A	B) Which estimator is more efficient? 表為民眾對市政府滿意程度之機率 最高分 5 分 ),試求: (A) $E(Y)$ (5% X 0 (表小於 30 歲) 1 (表大於、等於 30 歲) 總 和 A test was conducted to find the numb	<ul> <li>(10%)</li> <li>較分配:</li> <li>(B)</li> <li>(B)</li> <li>0</li> <li>0</li> <li>0</li> <li>0</li> <li>o</li> <li></li></ul>	( <i>X</i> 表年) ) <i>E</i> ( <i>XY</i> ) 2 0.05 0.1 0.15 rs a parti	<ul> <li>(10%)</li> <li>3</li> <li>0.15</li> <li>0.2</li> <li>0.35</li> </ul>	• 4 0.2 0.2 0.4 and of b	5 0.1 0 0.1 attery la	總和 0.5 0.5 sts. Refe	r to the
data given below: 200, 204, 197, 191, 203, 198, 216, 210, 202, 204, 198, 203, 181, 205, 194, and 194.	(E 3. 下 最 4. A d	B) Which estimator is more efficient? 表為民眾對市政府滿意程度之機率 最高分 5 分 ),試求: (A) $E(Y)$ (5% X 0 (表小於 30 歲) 1 (表大於、等於 30 歲) 總 和 A test was conducted to find the numbrata given below: 200, 204, 197, 191,	<ul> <li>(10%)</li> <li>較分配:</li> <li>(B)</li> <li>(B)</li> <li>0</li> <li>0</li> <li>0</li> <li>0</li> <li>o</li> <li></li></ul>	( <i>X</i> 表年) ) <i>E</i> ( <i>XY</i> ) 2 0.05 0.1 0.15 rs a parti	<ul> <li>(10%)</li> <li>3</li> <li>0.15</li> <li>0.2</li> <li>0.35</li> </ul>	• 4 0.2 0.2 0.4 and of b	5 0.1 0 0.1 attery la	總和 0.5 0.5 sts. Refe	r to the
data given below: 200, 204, 197, 191, 203, 198, 216, 210, 202, 204, 198, 203, 181, 205, 194,	(E 3. 下 最 4. A d a	B) Which estimator is more efficient? 表為民眾對市政府滿意程度之機率 able able able able able able able able	(10%) 率分配: 6) (B 6) (B 0 0 0 or of hou 203, 198	( <i>X</i> 表年) ) <i>E</i> ( <i>XY</i> ) 2 0.05 0.1 0.15 rs a parti , 216, 21	(10%) 3 0.15 0.2 0.35 icular bra 0, 202, 2	• 4 0.2 0.2 0.4 and of b	5 0.1 0 0.1 attery la	總和 0.5 0.5 sts. Refe	r to the

- 6. In a department store, it is found that out of a randomly selected 64 customers, 21 buy cards. Construct a 95% confidence interval for the proportion of customers buying cards. (10%)
- 7. A certain weather forecaster is correct 80% of the time when he forecasts rain, and 90% of the

time when he forecasts sun. In the area he's forecasting for, the weather is rainy 30% of the time and sunny 70% of the time. If the forecast is for rain today, what is the probability it will actually rain? (10%)

## 背面尚有試題

## 淡江大學 105 學年度日間部寒假轉學生招生考試試題系別:管理科學學系三年級科目:統計學23-)考試日期:12月3日(星期六) 第1節本試題共9 大題,2頁

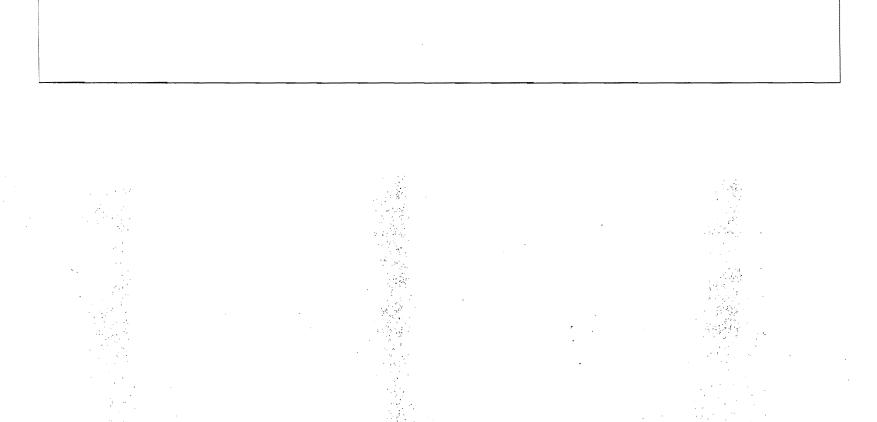
8. The probability of a person liking an advertisement is 0.6. Ten individuals are interviewed at random.

(A) What is the probability that exactly five like the advertisement? (5%)

(B) What is the probability that at least one likes the advertisement? (5%)

9. In fifty different localities, the cable company gives free access to all cable channels for a weekend, as a promotional gesture. The mean proportion of customers who had the premium channels before the promotion was 20%. The mean proportion of customers who had the premium channels after the promotion was 26%. Is the increase significant at  $\alpha = 0.05$ ? (10%)

提供統計查表值 z<sub>0.025</sub>= 1.96, z<sub>0.05</sub>=1.645, z<sub>0.1</sub>=1.282



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