

本試題是否可以使用計算機：可使用，不可使用（請命題老師勾選）

考試日期：0301，節次：1

作答說明：

1. 請在答案卷上標示題號與子題號後答題。
2. 計算題必須列出計算過程以利評閱，未依規定者將酌情扣分。
3. 計算時，請取至小數點以下二位數。
4. 可使用未具程式化功能之計算機。

一、解釋名詞（請中譯後說明之，共 50%每小題 5%）

- (1). Finite population
- (2). Qualitative data
- (3). Covariance
- (4). Pearson correlation coefficient
- (5). Expected value
- (6). Explanatory variable
- (7). Confidence interval
- (8). Level of significance
- (9). Null hypothesis
- (10). Chebyshev's theory

二、何謂卡方分配(Chi-square distribution)，卡方分配主要可用來作哪些檢定，請詳述之。20%

三、10 名學生每週上網時數如後：5.0, 4.4, 5.7, 5.6, 5.5, 5.2, 5.0, 4.8, 3.6, 4.1，請計算(a)樣本平均數、(b)樣本變異數、(c)、樣本標準差。15%

四、對 A、B、C 品牌的滿意度調查結果如表一（品牌的滿意度調查之觀察次數），請以  $\alpha=0.025$  檢定顧客對三品牌的滿意程度是否有顯著差異？15%

表一 品牌的滿意度調查之觀察次數

品牌	滿意程度		
	滿意	普通	不滿意
A	80	90	30
B	100	60	40
C	90	70	40

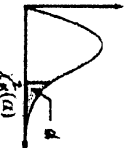
(背面仍有題目,請繼續作答)

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Y 自由度 (d.f.)

$P(\chi^2 \leq \chi^2_{\alpha}(d.f.)) = \alpha$

$\chi^2_{\alpha}(d.f.)$



Y	0.995	0.99	0.98	0.975	0.95	0.9	0.8	0.75	0.7	0.5
1	0.0000	0.0002	0.0006	0.0010	0.0039	0.0158	0.0642	0.1015	0.1485	0.4549
2	0.0100	0.0201	0.0404	0.0506	0.1026	0.2107	0.4463	0.5754	0.7133	1.3863
3	0.0717	0.1148	0.1848	0.2158	0.3518	0.5844	1.0052	1.2125	1.4237	2.3660
4	0.2070	0.2971	0.4294	0.4844	0.7107	1.0636	1.6488	1.9226	2.1947	3.3567
5	0.4118	0.5543	0.7519	0.8312	1.1455	1.6103	2.3425	2.6746	2.9999	4.3515
6	0.6757	0.8721	1.1344	1.2373	1.6354	2.2041	3.0701	3.4546	3.8276	5.3481
7	0.9893	1.2390	1.5643	1.6899	2.1673	2.8331	3.8223	4.2349	4.6713	6.3458
8	1.3444	1.6465	2.0325	2.1797	2.7326	3.4895	4.5936	5.0706	5.5274	7.3441
9	1.7349	2.0879	2.5324	2.7004	3.3251	4.1682	5.3801	5.8988	6.3933	8.3428
10	2.1558	2.5582	3.0591	3.2470	3.9403	4.8652	6.1791	6.7372	7.2672	9.3418
11	2.6032	3.0535	3.6087	3.8157	4.5748	5.5778	6.9887	7.5841	8.1479	10.3410
12	3.0738	3.5706	4.1783	4.4038	5.2260	6.3038	7.8073	8.4384	9.0343	11.3403
13	3.5650	4.1069	4.7654	5.0087	5.8919	7.0415	8.6339	9.2991	9.9257	12.3398
14	4.0747	4.6604	5.3682	5.6287	6.5206	7.7895	9.4673	10.1653	10.8215	13.3393
15	4.6009	5.2294	5.9849	6.2621	7.2609	8.5468	10.3070	11.0365	11.7212	14.3389
16	5.1422	5.8122	6.6142	6.9077	7.9616	9.3122	11.1521	11.9122	12.6243	15.3385
17	5.6973	6.4077	7.2550	7.5642	8.6718	10.0852	12.0023	12.7919	13.5307	16.3382
18	6.2648	7.0149	7.9062	8.2307	9.3904	10.8649	12.8570	13.6753	14.4399	17.3379
19	6.8439	7.6327	8.5670	8.9065	10.1170	11.6509	13.7158	14.5620	15.3517	18.3376
20	7.4338	8.2604	9.2367	9.5908	10.8508	12.4426	14.5784	15.4518	16.2659	19.3374
21	8.0336	8.8972	9.9145	10.2829	11.5913	13.2396	15.4446	16.3444	17.1823	20.3372
22	8.6427	9.5425	10.6000	10.9823	12.3380	14.0415	16.3140	17.2396	18.1007	21.3370
23	9.2604	10.1957	11.2926	11.6885	13.0905	14.8480	17.1865	18.1373	19.0211	22.3369
24	9.8862	10.8563	11.9918	12.4011	13.8484	15.6587	18.0818	19.0373	19.9432	23.3367
25	10.5196	11.5240	12.6973	13.1197	14.6114	16.4734	18.9397	19.9393	20.8670	24.3366
26	11.1602	12.1982	13.4086	13.8439	15.3792	17.2919	19.8202	20.8434	21.7924	25.3365
27	11.8077	12.8785	14.1254	14.5734	16.1514	18.1139	20.7030	21.7494	22.7192	26.3363
28	12.4613	13.5647	14.8475	15.3079	16.9279	18.9392	21.5880	22.6572	23.6475	27.3362
29	13.1211	14.2564	15.5745	16.0471	17.7084	19.7677	22.4751	23.5666	24.5770	28.3361
30	13.7867	14.9535	16.3062	16.7908	18.4927	20.5992	23.3641	24.4776	25.5078	29.3360

Y 自由度 (d.f.)

Y	0.3	0.25	0.2	0.1	0.05	0.025	0.02	0.01	0.005	0.001
1	1.0742	1.3233	1.6424	2.7055	3.8415	5.0239	5.4119	6.6349	7.8794	10.8274
2	2.4079	2.7726	3.2189	4.6052	5.9915	7.3778	7.8241	9.2104	10.5965	13.8150
3	3.6649	4.1083	4.6416	6.2514	7.8147	9.3484	9.8374	11.3449	12.8381	16.2660
4	4.8784	5.3833	5.9886	7.7794	9.4877	11.1433	11.6678	13.2767	14.8602	18.4662
5	6.0644	6.6257	7.2893	9.2363	11.0705	12.8325	13.3882	15.0863	16.7496	20.5147
6	7.2311	7.8408	8.5581	10.6446	12.5916	14.4494	15.0332	16.8119	18.5475	22.4575
7	8.3834	9.0371	9.8032	12.0170	14.0671	16.0128	16.6224	18.4753	20.2777	24.3213
8	9.5245	10.2189	11.0301	13.3616	15.5073	17.5345	18.1682	20.0902	21.9549	26.1239
9	10.6564	11.3887	12.2421	14.6837	16.9190	19.0228	19.6790	21.6660	23.5893	27.8767
10	11.7807	12.5489	13.4420	15.9872	18.3070	20.4832	21.1608	23.2093	25.1881	29.5879
11	12.8987	13.7007	14.6314	17.2750	19.6752	21.9200	22.6179	24.7250	26.7569	31.2635
12	14.0111	14.8454	15.8120	18.5493	21.0261	23.3367	24.0539	26.2170	28.2997	32.9092
13	15.1187	15.9839	16.9848	19.8119	22.3620	24.7356	25.4715	27.6882	29.8193	34.5274
14	16.2221	17.1169	18.1508	21.0641	23.6848	26.1189	26.8727	29.1412	31.3194	36.1239
15	17.3217	18.2451	19.3107	22.3071	24.9958	27.4884	28.2595	30.5780	32.8015	37.6978
16	18.4179	19.3689	20.4651	23.5418	26.2962	28.8453	29.6332	31.9999	34.2671	39.2518
17	19.5110	20.4887	21.6146	24.7690	27.5871	30.1910	30.9950	33.4087	35.7184	40.7911
18	20.6014	21.6049	22.7595	25.9894	28.8693	31.5264	32.3462	34.8052	37.1564	42.3119
19	21.6891	22.7178	23.9004	27.2036	30.1435	32.8523	33.6874	36.1908	38.5821	43.8194
20	22.7745	23.8277	25.0375	28.4120	31.4104	34.1696	35.0196	37.5663	39.9969	45.3142
21	23.8578	24.9348	26.1711	29.6151	32.6706	35.4789	36.3434	38.9322	41.4009	46.7963
22	24.9390	26.0393	27.3015	30.8133	33.9245	36.7807	37.6595	40.2894	42.7957	48.2676
23	26.0184	27.1413	28.4288	32.0069	35.1725	38.0756	38.9683	41.6383	44.1814	49.7276
24	27.0960	28.2412	29.5333	33.1962	36.4150	39.3641	40.2703	42.9798	45.5584	51.1790
25	28.1719	29.3388	30.6752	34.3816	37.6525	40.6465	41.5660	44.3140	46.9280	52.6187
26	29.2463	30.4346	31.7946	35.6332	38.8851	41.9231	42.8538	45.6416	48.2898	54.0511
27	30.3193	31.5284	32.9117	36.7412	40.1133	43.1945	44.1399	46.9628	49.6450	55.4751
28	31.3909	32.6205	34.0266	37.9159	41.3372	44.4608	45.4188	48.2782	50.9936	56.8918
29	32.4612	33.7109	35.1394	39.0875	42.5569	45.7223	46.6926	49.5878	52.3355	58.3006
30	33.5302	34.7997	36.2502	40.2560	43.7730	46.9792	47.9618	50.8922	53.6719	59.7022