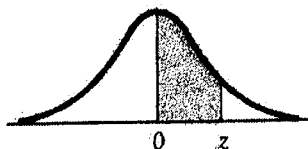本試題是否可以使用計算機： ☑可使用 , □不可使用 （請命題老師勾選）

1. If a positive correlation ($r=0.79$, $p<0.01$) is observed between mortality rates for liver cancer (deaths per 100,000 per year) and myocardial infarction (deaths per 100,000 per year). What does this association between two apparently unrelated diseases imply? (6 pt) What is the assumption needed to make inference about correlation coefficient? (5 pt)

2. If a metabolic disorder occurs in one of every 100 birth. If five infants are born in a particular hospital on a given day. What is the probability that none has this disorder? (12 pt)

3. A study of 2,000 Taiwanese women, aged 25 to 65 years old, found that, of these 2,000 women, the 48% who worked outside their home had HDL levels that were 2.4 to 3.6 mg/dl higher than the HDL levels of stay-at-homes women. If the difference in HDL levels is normally distributed with a mean of 0 and a standard deviation of 1.2 mg/dl, what is the probability of observing a difference in the HDL levels in a single pair of women between 2.4 and 3.6 mg/dl? (12 pt)

4. A disorder occurs in one out of every 1000 children. Health insurance records indicate that 60 children have this disorder in a total of 50,000 examined. If these 50,000 children were a random samples of the records. Please show your calculation of the probability of observing 60 or more children with metabolic disorder. Would you conclude that the observation of 60 children with disorders represents a rare event? (12 pt)

5. Please explain the following terms: (4 pt each)
   a). Odds
   b). Overmatching
   c). Internal validity
   d). Population attributable risk
   e). Indirect standardization

6. In young women, adenocarcinoma of vagina had rarely been discussed before the report of 10 cases at the National Cheng Kung University Hospital between 1982 and 1985. These women were born in hospitals around Tainan area between 1961 and 1965 . The researcher paid particular attention to the history of maternal use of estrogens during the pregnancy that might result in the patients with adenocarcinoma in vagina. Please help design an epidemiological study to understand the etiology of vaginal adenocarcinoma. (12 pt)

7. Bias. Please define the term "Bias" first and discuss how it can influence the results of a study. (12 pt)

8. Methods of controlling confounding in the design of the study. (9 pt)

國立成功大學九十六學年度碩士班招生考試試題

編號： 478　系所：環境醫學研究所丙組　　　科目：生物統計與流行病學

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）

z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	.0000	.0040	.0080	.0120	.0160	.0199	.0239	.0279	.0319	.0359
0.1	.0398	.0438	.0478	.0517	.0557	.0596	.0636	.0675	.0714	.0753
0.2	.0793	.0832	.0871	.0910	.0948	.0987	.1026	.1064	.1103	.1141
0.3	.1179	.1217	.1255	.1293	.1331	.1368	.1406	.1443	.1480	.1517
0.4	.1554	.1591	.1628	.1664	.1700	.1736	.1772	.1808	.1844	.1879
0.5	.1915	.1950	.1985	.2019	.2054	.2088	.2123	.2157	.2190	.2224
0.6	.2257	.2291	.2324	.2357	.2389	.2422	.2454	.2486	.2517	.2549
0.7	.2580	.2611	.2642	.2673	.2704	.2734	.2764	.2794	.2823	.2852
0.8	.2881	.2910	.2939	.2967	.2995	.3023	.3051	.3078	.3106	.3133
0.9	.3159	.3186	.3212	.3238	.3264	.3289	.3315	.3340	.3365	.3389
1.0	.3413	.3438	.3461	.3485	.3508	.3531	.3554	.3577	.3599	.3621
1.1	.3643	.3665	.3686	.3708	.3729	.3749	.3770	.3790	.3810	.3830
1.2	.3849	.3869	.3888	.3907	.3925	.3944	.3962	.3980	.3997	.4015
1.3	.4032	.4049	.4066	.4082	.4099	.4115	.4131	.4147	.4162	.4177
1.4	.4192	.4207	.4222	.4236	.4251	.4265	.4279	.4292	.4306	.4319
1.5	.4332	.4345	.4357	.4370	.4382	.4394	.4406	.4418	.4429	.4441
1.6	.4452	.4463	.4474	.4484	.4495	.4505	.4515	.4525	.4535	.4545
1.7	.4554	.4564	.4573	.4582	.4591	.4599	.4608	.4616	.4625	.4633
1.8	.4641	.4649	.4656	.4664	.4671	.4678	.4686	.4693	.4699	.4706
1.9	.4713	.4719	.4726	.4732	.4738	.4744	.4750	.4756	.4761	.4767
2.0	.4772	.4778	.4783	.4788	.4793	.4798	.4803	.4808	.4812	.4817
2.1	.4821	.4826	.4830	.4834	.4838	.4842	.4846	.4850	.4854	.4857
2.2	.4861	.4864	.4868	.4871	.4875	.4878	.4881	.4884	.4887	.4890
2.3	.4893	.4896	.4898	.4901	.4904	.4906	.4909	.4911	.4913	.4916
2.4	.4918	.4920	.4922	.4925	.4927	.4929	.4931	.4932	.4934	.4936
2.5	.4938	.4940	.4941	.4943	.4945	.4946	.4948	.4949	.4951	.4952
2.6	.4953	.4955	.4956	.4957	.4959	.4960	.4961	.4962	.4963	.4964
2.7	.4965	.4966	.4967	.4968	.4969	.4970	.4971	.4972	.4973	.4974
2.8	.4974	.4975	.4976	.4977	.4977	.4978	.4979	.4979	.4980	.4981
2.9	.4981	.4982	.4982	.4983	.4984	.4984	.4985	.4985	.4986	.4986
3.0	.4987	.4987	.4987	.4988	.4988	.4989	.4989	.4989	.4990	.4990

國立成功大學九十六學年度碩士班招生考試試題

編號： 478　系所：環境醫學研究所丙組　　　　科目：生物統計與流行病學

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）

Table A-3. Percentage points or critical values for the t distribution corresponding to commonly used areas under the curve.[1]

Degrees of Freedom	Area in 1 Tail				
	0.05	0.025	0.01	0.005	0.0005
	Area in 2 Tails				
	0.10	0.05	0.02	0.01	0.001
1	6.314	12.706	31.821	63.657	636.62
2	2.920	4.303	6.965	9.925	31.598
3	2.353	3.182	4.541	5.841	12.924
4	2.132	2.776	3.747	4.604	8.610
5	2.015	2.571	3.365	4.032	6.869
6	1.943	2.447	3.143	3.707	5.959
7	1.895	2.365	2.998	3.499	5.408
8	1.860	2.306	2.896	3.355	5.041
9	1.833	2.262	2.821	3.250	4.781
10	1.812	2.228	2.764	3.169	4.587
11	1.796	2.201	2.718	3.106	4.437
12	1.782	2.179	2.681	3.055	4.318
13	1.771	2.160	2.650	3.012	4.221
14	1.761	2.145	2.624	2.977	4.140
15	1.753	2.131	2.602	2.947	4.073
16	1.746	2.120	2.583	2.921	4.015
17	1.740	2.110	2.567	2.898	3.965
18	1.734	2.101	2.552	2.878	3.922
19	1.729	2.093	2.539	2.861	3.883
20	1.725	2.086	2.528	2.845	3.850
21	1.721	2.080	2.518	2.831	3.819
22	1.717	2.074	2.508	2.819	3.792
23	1.714	2.069	2.500	2.807	3.767
24	1.711	2.064	2.492	2.797	3.745
25	1.708	2.060	2.485	2.787	3.725
26	1.706	2.056	2.479	2.779	3.707
27	1.703	2.052	2.473	2.771	3.690
28	1.701	2.048	2.467	2.763	3.674
29	1.699	2.045	2.462	2.756	3.659
30	1.697	2.042	2.457	2.750	3.646
40	1.684	2.021	2.423	2.704	3.551
60	1.671	2.000	2.390	2.660	3.460
120	1.658	1.980	2.358	2.617	3.373
∞	1.645	1.960	2.326	2.576	3.291

[1]Adapted and reproduced, with permission, from Table 12 in Pearson ES, Hartley HO (editors): *Biometrika Tables for Statisticians*, 3rd ed. Vol 1. Cambridge University Press, 1966. Used with the kind permission of the Biometrika Trustees.