題號： 242　　國立臺灣大學 114 學年度碩士班招生考試試題

科目： 研究方法

節次： 7

一、請擬一個農業相關的研究計劃書，採用深度訪談法。(30 分)

（1） 請說明研究計劃的主題、重要性與研究問題。

（2） 請說明深度訪談方法在此研究的適用性與研究設計，並解釋設計理由。

（3） 請說明訪談者在此研究中扮演的角色，以及應有的技能。

二、請分別解釋量性研究與質性研究方法的特色，各自的優點、限制，並舉例說明他們各適用於什麼類型的研究。(20 分)

三、以下為單選題（30 分）※ **本大題請於試卷內之「選擇題作答區」依序作答。**

（1） A type of probability distribution that shows the probability of x successes in n trials, where the probability of success remains the same from trial to trial, is referred to as a _____.

A) hypergeometric probability distribution

B) uniform probability distribution

C) normal probability distribution

D) binomial probability distribution

（2） The seasonal output of a new experimental strain of pepper plants was carefully weighed. The mean weight per plant is 15.0 pounds, and the standard deviation of the normally distributed weights is 1.75 pounds. Of the 200 plants in the experiment, how many produced peppers weighing between 13 and 16 pounds?

A) 100

B) 118

C) 197

D) 53

（3） An analysis of the grades on the first test in Statistics revealed that they approximate a normal curve with a mean of 75 and a standard deviation of 8. The instructor wants to award the grade of A to the upper 10% of the test grades. To the nearest percent, what is the dividing point between an A and a B grade?

A) 80

B) 85

C) 90

D) 95

（4） When dividing a population into subgroups so that a random sample from each subgroup can be collected, what type of sampling is used?

A) Simple random sampling

B) Systematic sampling

C) Stratified random sampling

D) Cluster sampling

（5） According to the central limit theorem, _____.

A) sample size is important when the population is not normally distributed

B) increasing the sample size decreases the dispersion of the sampling distribution

C) the sampling distribution of the sample means is uniform

D) the sampling distribution of the sample means will be skewed

（6） What is the interpretation of a 95% confidence level?

A) There's a 95% chance that the given interval includes the true value of the population parameter.

B) Approximately 95 out of 100 such intervals would include the true value of the population parameter.

C) There's a 5% chance that the given interval does not include the true value of the population parameter.

D) The interval contains 95% of all sample means.

見背面

（7） The distribution of Student's *t* has a mean _____.

A) of zero and a standard deviation of one

B) of one and a standard deviation of one

C) of zero and a standard deviation that depends on the sample size

D) that depends on the sample size and a standard deviation of one

（8） A survey of 25 grocery stores revealed that the mean price of a gallon of milk was $2.98, with a standard error of $0.10. What is the 95% confidence interval to estimate the true cost of a gallon of milk?

A) $2.81 to $3.15

B) $2.94 to $3.02

C) $2.77 to $3.19

D) $2.95 to $3.01

（9） Define the level of significance.

A) It is the probability of a Type II error.

B) It is the probability of a Type I error.

C) It is a z-value of 1.96.

D) It is the beta error.

（10） Consider a two-tailed test with a level of significance of 0.01. The p-value is determined to be 0.05; therefore, the null hypothesis _____.

A) should not be rejected

B) must be rejected

C) may or may not be rejected depending on the square root of the sample size

D) is the same as the alternative hypothesis

四、假設全體臺灣兒童這個母體，每天運動時間為常態分配，平均數是 45 分鐘、標準差為 10 分鐘。我們隨機選出 16 位兒童，發現他們每天運動時間的平均數是 50 分鐘、標準差為 12 分鐘。請根據這些資訊回答以下問題：（10 分）

（1） 分別使用母體標準差與樣本標準差計算平均數的標準誤，並說明這兩個標準誤的意思，也就是我們可以從標準誤得到什麼訊息。

（2） 以上題使用母體標準差所計算出來的標準誤，判斷隨機抽出此一樣本平均數（平均運動時間大於 50 分鐘）的機率。

（3） 以（1）小題使用樣本標準差所計算出來的標準誤，估計隨機請抽出此一樣本平均數（平均運動時間大於 50 分鐘）的機率。

（4） 假設我們的樣本規模並非 16 位兒童而是 36 位，那麼這樣的情況對於平均數之標準誤會產生什麼影響？為什麼呢？

（5） 較大的樣本規模，會對（2）、（3）小題所計算出來的機率產生影響，請解釋原因。

五、根據變異數分析的報表回答下列問題：（4 分）

Analysis of Variance					
Source	DF	SS	MS	F	P
Regression	2	77.907	38.954	4.14	0.021
Residual Error	62	583.693	9.414		
Total	64	661.6			

（1） 請計算估計標準誤（standard error of estimate），由估計標準誤推估約有 95% 的殘差（residuals） 會介於多大的數值之間？

（2） 請計算複判定係數（coefficient of multiple determination）並解釋這個數值的意思。

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六、根據多元迴歸分析的報表回答下列問題：（6 分）

Predictor	Coefficient	SE Coefficient	t	p-value	
Constant	84.998	1.863	45.62	0.000	
x_1	2.391	1.200	1.99	0.051	
x_2	-0.409	0.172	-2.38	0.021	
Analysis of Variance					
Source	DF	SS	MS	F	p-value
Regression	2	77.907	38.954	4.138	0.021
Residual Error	62	583.693	9.414		
Total	64	661.600			

（1） 請寫出迴歸方程式。

（2） 若 $X_1=4$ 且 $X_2=11$，請問依變項的預測值為多少？

（3） 這個研究的樣本數是多少？有幾個自變項？

見背面

Z Table

z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.0000	0.0040	0.0080	0.0120	0.0160	0.0199	0.0239	0.0279	0.0319	0.0359
0.1	0.0398	0.0438	0.0478	0.0517	0.0557	0.0596	0.0636	0.0675	0.0714	0.0753
0.2	0.0793	0.0832	0.0871	0.0910	0.0948	0.0987	0.1026	0.1064	0.1103	0.1141
0.3	0.1179	0.1217	0.1255	0.1293	0.1331	0.1368	0.1406	0.1443	0.1480	0.1517
0.4	0.1554	0.1591	0.1628	0.1664	0.1700	0.1736	0.1772	0.1808	0.1844	0.1879
0.5	0.1915	0.1950	0.1985	0.2019	0.2054	0.2088	0.2123	0.2157	0.2190	0.2224
0.6	0.2257	0.2291	0.2324	0.2357	0.2389	0.2422	0.2454	0.2486	0.2517	0.2549
0.7	0.2580	0.2611	0.2642	0.2673	0.2704	0.2734	0.2764	0.2794	0.2823	0.2852
0.8	0.2881	0.2910	0.2939	0.2967	0.2995	0.3023	0.3051	0.3078	0.3106	0.3133
0.9	0.3159	0.3186	0.3212	0.3238	0.3264	0.3289	0.3315	0.3340	0.3365	0.3389
1.0	0.3413	0.3438	0.3461	0.3485	0.3508	0.3531	0.3554	0.3577	0.3599	0.3621
1.1	0.3643	0.3665	0.3686	0.3708	0.3729	0.3749	0.3770	0.3790	0.3810	0.3830
1.2	0.3849	0.3869	0.3888	0.3907	0.3925	0.3944	0.3962	0.3980	0.3997	0.4015
1.3	0.4032	0.4049	0.4066	0.4082	0.4099	0.4115	0.4131	0.4147	0.4162	0.4177
1.4	0.4192	0.4207	0.4222	0.4236	0.4251	0.4265	0.4279	0.4292	0.4306	0.4319
1.5	0.4332	0.4345	0.4357	0.4370	0.4382	0.4394	0.4406	0.4418	0.4429	0.4441
1.6	0.4452	0.4463	0.4474	0.4484	0.4495	0.4505	0.4515	0.4525	0.4535	0.4545
1.7	0.4554	0.4564	0.4573	0.4582	0.4591	0.4599	0.4608	0.4616	0.4625	0.4633
1.8	0.4641	0.4649	0.4656	0.4664	0.4671	0.4678	0.4686	0.4693	0.4699	0.4706
1.9	0.4713	0.4719	0.4726	0.4732	0.4738	0.4744	0.4750	0.4756	0.4761	0.4767
2.0	0.4772	0.4778	0.4783	0.4788	0.4793	0.4798	0.4803	0.4808	0.4812	0.4817
2.1	0.4821	0.4826	0.4830	0.4834	0.4838	0.4842	0.4846	0.4850	0.4854	0.4857
2.2	0.4861	0.4864	0.4868	0.4871	0.4875	0.4878	0.4881	0.4884	0.4887	0.4890
2.3	0.4893	0.4896	0.4898	0.4901	0.4904	0.4906	0.4909	0.4911	0.4913	0.4916
2.4	0.4918	0.4920	0.4922	0.4925	0.4927	0.4929	0.4931	0.4932	0.4934	0.4936
2.5	0.4938	0.4940	0.4941	0.4943	0.4945	0.4946	0.4948	0.4949	0.4951	0.4952
2.6	0.4953	0.4955	0.4956	0.4957	0.4959	0.4960	0.4961	0.4962	0.4963	0.4964
2.7	0.4965	0.4966	0.4967	0.4968	0.4969	0.4970	0.4971	0.4972	0.4973	0.4974
2.8	0.4974	0.4975	0.4976	0.4977	0.4977	0.4978	0.4979	0.4979	0.4980	0.4981
2.9	0.4981	0.4982	0.4982	0.4983	0.4984	0.4984	0.4985	0.4985	0.4986	0.4986
3.0	0.4987	0.4987	0.4987	0.4988	0.4988	0.4989	0.4989	0.4989	0.4990	0.4990

T Distribution Table

	P						
one-tail	0.1	0.05	0.025	0.01	0.005	0.001	0.0005
two-tails	0.2	0.1	0.05	0.02	0.01	0.002	0.001
DF							
1	3.078	6.314	12.706	31.821	63.656	318.289	636.578
2	1.886	2.92	4.303	6.965	9.925	22.328	31.6
3	1.638	2.353	3.182	4.541	5.841	10.214	12.924
4	1.533	2.132	2.776	3.747	4.604	7.173	8.61
5	1.476	2.015	2.571	3.365	4.032	5.894	6.869
6	1.44	1.943	2.447	3.143	3.707	5.208	5.959
7	1.415	1.895	2.365	2.998	3.499	4.785	5.408
8	1.397	1.86	2.306	2.896	3.355	4.501	5.041
9	1.383	1.833	2.262	2.821	3.25	4.297	4.781
10	1.372	1.812	2.228	2.764	3.169	4.144	4.587
11	1.363	1.796	2.201	2.718	3.106	4.025	4.437
12	1.356	1.782	2.179	2.681	3.055	3.93	4.318
13	1.35	1.771	2.16	2.65	3.012	3.852	4.221
14	1.345	1.761	2.145	2.624	2.977	3.787	4.14
15	1.341	1.753	2.131	2.602	2.947	3.733	4.073
16	1.337	1.746	2.12	2.583	2.921	3.686	4.015
17	1.333	1.74	2.11	2.567	2.898	3.646	3.965
18	1.33	1.734	2.101	2.552	2.878	3.61	3.922
19	1.328	1.729	2.093	2.539	2.861	3.579	3.883
20	1.325	1.725	2.086	2.528	2.845	3.552	3.85
21	1.323	1.721	2.08	2.518	2.831	3.527	3.819
22	1.321	1.717	2.074	2.508	2.819	3.505	3.792
23	1.319	1.714	2.069	2.5	2.807	3.485	3.768
24	1.318	1.711	2.064	2.492	2.797	3.467	3.745
25	1.316	1.708	2.06	2.485	2.787	3.45	3.725
26	1.315	1.706	2.056	2.479	2.779	3.435	3.707
27	1.314	1.703	2.052	2.473	2.771	3.421	3.689
28	1.313	1.701	2.048	2.467	2.763	3.408	3.674
29	1.311	1.699	2.045	2.462	2.756	3.396	3.66
30	1.31	1.697	2.042	2.457	2.75	3.385	3.646
60	1.296	1.671	2	2.39	2.66	3.232	3.46
120	1.289	1.658	1.98	2.358	2.617	3.16	3.373
1000	1.282	1.646	1.962	2.33	2.581	3.098	3.3
Inf	1.282	1.645	1.96	2.326	2.576	3.091	3.291

試題隨卷繳回