| 大葉大學九十一學年度轉學招生考試試題紙 | | | | | | | |
|---|---|---|---|---|---|---|---|
| 系　　別 | 日\第二部 | 年級 | 考試科目（中文名稱） | 考試日期 | 節次 | 備註 | 共 5 頁 |
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I. Multiple choice questions　choose one best answer　**4 points for each question**

1.Suppose we wish to test $H_0 : \mu = 47$ vs. $H_A : \mu > 47$ . What will result if we conclude that the mean is greater than 47 when its true value is really 52?

a. We have made a Type II error.

b. We have made a Type I error.

c. We have made a correct decision.

d. None of the above is correct.

2. How many Kleenex should the Kimberly clark Corporation package of tissues contain? Researchers determined that 60 tissues is the average number of tissues used during a cold. Suppose a random sample of 10000 Kleenex users yielded the following data on the number of tissues used during a cold: $\bar{x} = 52, s = 22$ using the sample information provided, calculate the value of the test statistic

a. $z = \dfrac{52 - 60}{22}$

b. $z = \dfrac{60 - 52}{\dfrac{22}{100^2}}$

c. $z = \dfrac{52 - 60}{22}$

d. $z = \dfrac{52 - 60}{\dfrac{22}{10}}$

3.In question(2) above, suppose the alternative we wanted to test was $H_A : \mu < 60$ . State the correct rejection for $\alpha = .05$

a. Reject $H_0$ if $z > 1.645$

b. Reject $H_0$ if $z < 1.645$

c. Reject $H_0$ if $z > 1.96$ or $z < 1.96$

d. Reject $H_0$ if $z < -1.96$

4.We have created a 95% confidence interval for $\mu$ with the result (10,15).

What conclusion will we make if we test $H_0 : \mu = 16$ vs. $H_A : \mu \neq 16$ at $\alpha = 0.05$ ?

a. Reject $H_0$ in favor of $H_A$

b. Accept $H_0$ in favor of $H_A$

c. fail to reject $H_0$

d. We cannot fell what our decision will be with the information given.

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5. A local eat-in-pizza restaurant wants to investigate the possibility of starting to deliver pizza. The owner of the store has determined the home delivery will be successful if the average time spent on the deliveries does not exceed 38 minutes. The owner has randomly selected 15 customers and has delivered pizza to their homes. Which of the following tests are specified to show that the pizza delivery will not be successful?

a. $H_0 : \mu = 38$ vs. $H_A : \mu < 38$

b. $H_0 : \mu = 38$ vs. $H_A : \mu > 38$

c. $H_0 : \mu = 38$ vs. $H_A : \mu \neq 38$

d. $H_0 : \mu < 38$ vs. $H_A : \mu = 38$

6.In question(5) above, suppose the p-value for the test was found to be 0.0342. State the correct conclusion.

a. At $\alpha = .05$, we fail to reject $H_0$

b. At $\alpha = .02$, we reject $H_0$

c. At $\alpha = .03$, we accept $H_0$

d. At $\alpha = .025$, we fail to reject $H_0$

7.Are Japanese managers more motivated than American managers? A randomly selected group of each were administered the Sarnoff Survey of attitudes Toward Life (SSATL), which measures motivation for upward mobility. The SSATL Scores are summarized below:

| | American | Japanese |
|---|---|---|
| Sample n | 211 | 100 |
| Mean SSATL Score | 65.75 | 79.83 |
| Standard deviation | 11.07 | 6.41 |

Suppose the test statistic is $z = .2.45$. Find the p-value for a greater than (>) alternative test of hypothesis

a. 0.0071

b. 0.4929

c. 0.9858

d. 0.0142

8.In a controlled laboratory environment, random samples of 10 adults and 10 children were tested by a psychologist to determine the room temperature that each person finds most comfortable. The data are summarized below:

| | Sample Mean | Sample Variance |
|---|---|---|
| Adult(1) | 77.5F | 4.5 |
| Children(2) | 74.5F | 2.5 |

If the psychologist wished to test the hypothesis that children prefer warmer room temperatures than adults, which set of hypothesis would he use?

a. $H_0 : (\mu_1 - \mu_2) = 0$ vs. $H_A : (\mu_1 - \mu_2) < 0$

b. $H_0 : (\mu_1 - \mu_2) = 3$ vs. $H_A : (\mu_1 - \mu_2) \neq 0$

c. $H_0 : (\mu_1 - \mu_2) = 0$ vs. $H_A : (\mu_1 - \mu_2) > 0$

d. $H_0 : (\mu_1 - \mu_2) = 0$ vs. $H_A : (\mu_1 - \mu_2) \neq 0$

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9.The FDA wands to compare the mean caffeine contents of two other brands of 6-oz cola, Pepsi and Shasta. Independent random samples of 6-oz. cans of each brand were selected and the caffeine content of each can determined. The study provided the following summary information.

| | Pepsi | Shasta |
|---|---|---|
| Sample Size | 15 | 10 |
| Mean (ounces) | 18 | 20 |
| Variance | 1.2 | 1.5 |

What assumption are necessary for the validity of the interval estimation procedure?

a. The populations of caffeine measurements for 6-oz cans of Pepsi and Shasta are normally distributed and have equal means.

b. The populations of caffeine measurements for 6-oz cans of Pepsi and Shasta are normally distributed and have equal variances.

c. The error are independent and normally distributed, with mean 0 and constant variance.

d. No assumption are necessary because of the central limit theorem.

10.The rate of married women's participation in the work force has increased steadily over the past several years. How does wives' employment status affect their husbands' well being? To answer this question a survey of the job satisfaction of 25 male accountants who were employed full-time and married was conducted. In this sample, 15 wives were employed and 10 were unemployed. The goal of the study is to compare the mean job satisfaction levels of the two groups of husband (1).those with working wives and (2).those with unemployed wives. The statistic for this problem has what type of distribution?

a. Normal(z)

b. student's t

c. skewed left

d. skewed right

II Essay question　　**10 points for each question**

1.The Environment Profection Agency (EPA) estimated that `the 1991 G-car obtains a mean of 35 mile per gallon on the highway, and the company that manufactures the car claims that it exceeds the EPA estimate in highway driving. To support its assertion, the company randomly selects 36 1991 G-Cars and records the mileage obtained for each car over a driving course similar to that used by the EPA. The following data resulted: $\bar{x} = 36.8$ miles per gallon, $s = 6.0$ mile per gallon.

a. Test the hypothesis $H_o : \mu = 35$ vs. $H_A : \mu > 35$ with $\alpha = 0.05$

b. find the p-values

2. Based on the information given in question(1) above, calculate the value $\beta$ if the true value of mean is really 37 mpg. Use $\alpha = 0.025$.

3. A marketing report states that the annual per capita expenditures on cereal following a normal distribution with mean $\mu = \$60$ and standard deviation $\sigma = \$15$. We want to test $H_o : \mu = \$60$ vs. $H_A : \mu \neq \$60$, using $\alpha = 0.05$ and a random sample of $n = 100$ customers. Find the power of the test if the true value of the mean is $\mu = 58$.

4. In question(3) above, if we randomly select a sample of $n = 100$ and calculate the $\bar{x} = 65$, test the $H_o : \mu = \$60$ vs. $H_A : \mu \neq \$60$, using $\alpha = 0.05$.

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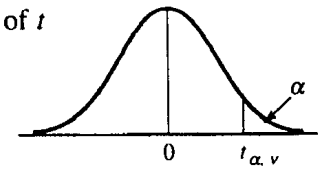
5.An experiment has been conducted at a university to compare the mean number of study hours expended per week by student athletes with the mean number of hours expended by nonathletes. A random sample of 55 athletes produced a mean equal to 20.6 hours studied per week and a standard deviation equal to 5.3 hours. A second random sample of 200 nonathletes produced a mean equal to 23.5 hours per week and a standard deviation equal to 4.1 hours. Find a 95% confident interval for $\mu_1 - \mu_2$.

6. Based on the information given in question(5) above, how many students would need to be sample in order to estimate the difference in means to within 2 hours?

***Critical values of the t distribution***

The following table contains critical values of $t$ for given probability levels.




| Degrees of Freedom, $\nu$ | CRITICAL VALUES $t\alpha$ | | | | |
|---|---|---|---|---|---|
| | $t_{.10}$ | $t_{.05}$ | $t_{.025}$ | $t_{.01}$ | $t_{.005}$ |
| 1 | 3.078 | 6.314 | 12.706 | 31.821 | 63.657 |
| 2 | 1.886 | 2.920 | 4.303 | 6.965 | 9.925 |
| 3 | 1.638 | 2.353 | 3.182 | 4.541 | 5.841 |
| 4 | 1.533 | 2.132 | 2.776 | 3.747 | 4.604 |
| 5 | 1.476 | 2.015 | 2.571 | 3.365 | 4.032 |
| 6 | 1.440 | 1.943 | 2.447 | 3.143 | 3.707 |
| 7 | 1.415 | 1.895 | 2.365 | 2.998 | 3.499 |
| 8 | 1.397 | 1.860 | 2.306 | 2.896 | 3.355 |
| 9 | 1.383 | 1.833 | 2.262 | 2.821 | 3.250 |
| 10 | 1.372 | 1.812 | 2.228 | 2.764 | 3.169 |
| 11 | 1.363 | 1.796 | 2.201 | 2.718 | 3.106 |
| 12 | 1.356 | 1.782 | 2.179 | 2.681 | 3.055 |
| 13 | 1.350 | 1.771 | 2.160 | 2.650 | 3.012 |
| 14 | 1.345 | 1.761 | 2.145 | 2.624 | 2.977 |
| 15 | 1.341 | 1.753 | 2.131 | 2.602 | 2.947 |
| 16 | 1.337 | 1.746 | 2.120 | 2.583 | 2.921 |
| 17 | 1.333 | 1.740 | 2.110 | 2.567 | 2.898 |
| 18 | 1.330 | 1.734 | 2.101 | 2.552 | 2.878 |
| 19 | 1.328 | 1.729 | 2.093 | 2.539 | 2.861 |
| 20 | 1.325 | 1.725 | 2.086 | 2.528 | 2.845 |
| 21 | 1.323 | 1.721 | 2.080 | 2.518 | 2.831 |
| 22 | 1.321 | 1.717 | 2.074 | 2.508 | 2.819 |
| 23 | 1.319 | 1.714 | 2.069 | 2.500 | 2.807 |
| 24 | 1.318 | 1.711 | 2.064 | 2.492 | 2.797 |
| 25 | 1.316 | 1.708 | 2.060 | 2.485 | 2.787 |
| 26 | 1.315 | 1.706 | 2.056 | 2.479 | 2.779 |
| 27 | 1.314 | 1.703 | 2.052 | 2.473 | 2.771 |
| 28 | 1.313 | 1.701 | 2.048 | 2.467 | 2.763 |
| 29 | 1.311 | 1.699 | 2.045 | 2.462 | 2.756 |
| 30 | 1.310 | 1.697 | 2.042 | 2.457 | 2.750 |
| 40 | 1.303 | 1.684 | 2.021 | 2.423 | 2.704 |
| 60 | 1.296 | 1.671 | 2.000 | 2.390 | 2.660 |
| 120 | 1.290 | 1.661 | 1.984 | 2.358 | 2.626 |
| ∞ | 1.282 | 1.645 | 1.960 | 2.326 | 2.576 |

From Merrington, Maxine. "Table of Percentage Points of the $t$-Distribution." *Biometrika*, vol. 32, 1941, p. 300.

***Example:*** The value of $t$ with 10 degrees of freedom for which 1% of the area is in the right-hand tail is 2.764; $t_{.01} = 2.764$ for $\nu = 10$.

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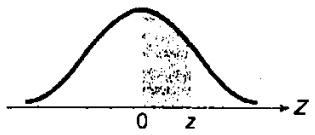
**Areas of the standard normal distribution. The entries in this table are the probabilities that a standard normal random variable is between 0 and $z$ (the shaded area).**




| | Second Decimal Place in z | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 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 |
| 3.1 | 0.4990 | 0.4991 | 0.4991 | 0.4991 | 0.4992 | 0.4992 | 0.4992 | 0.4992 | 0.4993 | 0.4993 |
| 3.2 | 0.4993 | 0.4993 | 0.4994 | 0.4994 | 0.4994 | 0.4994 | 0.4994 | 0.4995 | 0.4995 | 0.4995 |
| 3.3 | 0.4995 | 0.4995 | 0.4995 | 0.4996 | 0.4996 | 0.4996 | 0.4996 | 0.4996 | 0.4996 | 0.4997 |
| 3.4 | 0.4997 | 0.4997 | 0.4997 | 0.4997 | 0.4997 | 0.4997 | 0.4997 | 0.4997 | 0.4997 | 0.4998 |
| 3.5 | 0.4998 | | | | | | | | | |
| 4.0 | 0.49997 | | | | | | | | | |
| 4.5 | 0.499997 | | | | | | | | | |
| 5.0 | 0.4999997 | | | | | | | | | |