| UNIV. OF JORDAN | MATH. 131 | SUMMER, 2002-2003 |
|---|---|---|
| MATH. DEPT. | EXAM 2 | 19/8/2003 |

**Name:** **Student No.:** **Section No.:**

**Note: Carry all your calculations to two decimals and circle the correct answer.**

(1) If the level of significance $\alpha$ of a hypothesis test is raised from 0.01 to 0.05, then P(acceptance $H_0$| $H_1$ )

(a) will also be increased from 0.01 to 0.5 (b) will not be changed
(c) will be decreased (d) none of the above

(2) To test $H_0$: p=0.6 versus $H_1$: p>0.6, toss a coin 10 times and use $\alpha \leq 0.05$. The rejection region is given by

(a) {X: X>8} (b) {X: X<8} (c) {X: X>7} (d) {X: X<7}

(3) If X and Y are independent variables such that X~N(50,15) and Y~N(60,10), then P(3X > 2Y)=

(a) 0.9884 (b) 0.0116 (c) 0 (d) 1

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* **For Questions (4)-(8):** The temperatures of summer weather this year are normally distributed with mean 38 degrees and standard deviation 4 degrees.

(4) The smallest temperature for the hottest 10% of the temperatures is

(a) 10% (b) 43.12 (c) 32.88 (d) 90%

(5) If a day is taken at random, what is the probability that its temperature exceeds 43.1 degrees?

(a) 0.95 (b) 0.10 (c) 0.05 (d) 0.01

(6) If 3 days are taken at random, what is the probability that at least one day will have temperature more than 43.1 degrees?

(a) 010 (b) 0.729 (c) 0.271 (d) 0.3

(7) If 50 days are selected at random, what is the probability that the number of those days with temperatures more than 43.1 is at least 10 days?

(a) 0.9909 (b) 0.983 (c) 0.017 (d) 0.0091

(8) If 9 days are taken at random, what is the probability that their temperature average exceeds the true mean by more than 2 degrees?

(a) 0.6915 (b) 0.9332 (c) 0.3085 (d) 0.0668

* **<u>For Questions (9)-(10)</u>:** Let $X_1$, $X_2$, ..., $X_{16}$ be a random sample from a $N(\mu, \sigma^2)$. Let $\overline{X}$ and $S^2$ be the sample mean and variance, respectively.

(9) If $\sigma$ =8, then the value of c such that $P(S^2 \leq c) = 0.95$

(a) 24.996 (b) 106.65 (c) 30.98 (d) 7.26

(10) If $\mu$ =10 and S=10, then the value of c such that $P(\overline{X} \geq c)=0.90$

(a) 10.84 (b) 13.35 (c) 1.341 (d) 23.41

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(11) It is required to estimate the mean weight of newborns by 90% C.I. so that the error of estimation is within 2. If $\sigma^2$=64, then the sample size needed is

(a) 62 (b) 172 (c) 43 (d) 246

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* **<u>For Questions (12)-(13)</u>:** In testing $H_0$: $\mu$ =75 versus $H_1$: $\mu$ >75, take a sample of size 25 and reject $H_0$ if $\overline{X}$ >77. Assume $\sigma^2$=22.

(12) The level of significance $\alpha$ for this test is

(a) 0.0435 (b) 0.9838 (c) 0.0166 (d) 0.3772

(13) The probability of type II error $\beta$ when $\mu$ =78

(a) 0.4168 (b) 0.8023 (c) 0.8577 (d) 0.5832

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* **<u>For Questions (14)-(16)</u>:** The mean and standard deviation of blood pressures of two independent samples from two hospitals are given by

| Hospital | Sample Size | Sample Mean | Sample Std. |
|---|---|---|---|
| I | 49 | 125 | 10 |
| II | 16 | 110 | 5 |

Let $\mu_I$ and $\mu_{II}$ be the respective population means.

(14) A 98% C. I. for $\mu_I$ is

(a) (104.4, 145.6) (b) (101.7, 148.3) (c) (122.06, 127.94) (d) (121.67, 128.33)

(15) A 95% C. I. for $\mu_{II}$

(a) (107.66, 122.19) (b) (117.34, 122.66) (c) (117.81, 112.19) (d) (107.34, 112.66)

(16) The p-value associated with the test $H_0$: $\mu_I = 128$ versus $H_1$: $\mu_I < 128$ is

(a) 0.0179 (b) 0.3821 (c) 0.9821 (d) 0