



STAT 109
Mid Term-II Examination

| | | | |
|------------------------|--|------------------------|--|
| Student Name | | | |
| Student Number: | | Section Number: | |
| Teacher Name: | | Serial Number: | |

- » Mobile Telephones are not allowed in the classrooms
- » Time allowed is 1 and 1/2 hour
- » Attempt all questions
- » Choose the nearest number to your answer
- » For each question, put the code of the correct answer in the following table beneath the question number:

| | | | | | | | | | |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| D | C | A | A | B | C | A | A | D | C |

| | | | | | | | | | |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| C | B | D | C | B | D | C | B | A | D |

| | | | | |
|-----------|-----------|-----------|-----------|-----------|
| 21 | 22 | 23 | 24 | 25 |
| A | B | B | C | C |

QUESTIONS 1 - 3

The IQ (Intelligent Quotient) of individuals admitted to a state school for the mentally retarded are approximately normally distributed with a mean of 60 and a standard deviation of 10, then:

- 1) The probability that an individual picked at random will have an IQ greater than 75 is:

| | | | |
|------------|------------|------------|-------------------|
| (A) 0.9332 | (B) 0.8691 | (C) 0.7286 | (D) <u>0.0668</u> |
|------------|------------|------------|-------------------|

- 2) The probability that an individual picked at random will have an IQ between 55 and 75 is:

| | | | |
|------------|------------|-------------------|------------|
| (A) 0.3085 | (B) 0.6915 | (C) <u>0.6247</u> | (D) 0.9332 |
|------------|------------|-------------------|------------|

- 3) If the probability that an individual picked at random will have an IQ less than k is 0.1587. Then the value of k

| | | | |
|---------------|--------|--------|--------|
| (A) <u>50</u> | (B) 45 | (C) 51 | (D) 40 |
|---------------|--------|--------|--------|

QUESTIONS 4 - 7

In a sample of 225 males, 53 use internet while in a sample of 68 females, 31 use internet in the internet café. Then

- 4) the point estimate of the population proportion of males using internet is

| | | | |
|-------------------|------------|------------|------------|
| (A) <u>0.2356</u> | (B) 0.7149 | (C) 0.5436 | (D) 0.4559 |
|-------------------|------------|------------|------------|

- 5) the 90% confidence interval for the proportion of all males using internet is

| | | | |
|---------------------|-----------------------------|---------------------|---------------------|
| (A)(0.2495, 0.1361) | (B) <u>(0.1891, 0.2821)</u> | (C)(0.2068, 0.2088) | (D)(0.2088, 0.2068) |
|---------------------|-----------------------------|---------------------|---------------------|

- 6) the point estimate for the difference between the proportions of females and males using internet in the two sampled populations is

| | | | |
|------------|------------|-------------------|------------|
| (A) 0.5344 | (B) 0.7345 | (C) <u>0.2203</u> | (D) 0.4006 |
|------------|------------|-------------------|------------|

- 7) the 99 % confident interval for the difference between the proportions of females and males using internet in the two sampled populations is

| | | | |
|---------------------------|--------------------|-------------------|-------------------|
| (A) <u>(0.049, 0.392)</u> | (B) (0.119, 0.377) | (C)(0.023, 0.108) | (D)(0.521, 1.034) |
|---------------------------|--------------------|-------------------|-------------------|

QUESTIONS 8 - 9

The average number of heart beats per minute for a sample of 49 subjects was found to be 90. Assume population standard deviation is 10. Then

- 8) The 100 $(1 - \alpha)$ percent confidence interval for the population average μ is

expressed as

| | |
|--|---|
| (A) $\bar{x} \pm z_{(1-\alpha/2)}\sigma / \sqrt{n}$ | (B) $\bar{x} \pm z_{(1-\alpha/2)}S / \sqrt{n}$ |
| (C) $\bar{x} \pm t_{n-1, (1-\alpha/2)}\sigma / \sqrt{n}$ | (D) $\bar{x} \pm t_{n-1, (1-\alpha/2)}S / \sqrt{n}$ |

- 9) The 95% confidence interval for μ is given by

| | | | |
|--------------------|--------------|------------------|-------------------------|
| (A) (87.65, 92.35) | (B) (85, 95) | (C) (86.5, 93.5) | (D) <u>(87.2, 92.8)</u> |
|--------------------|--------------|------------------|-------------------------|

QUESTIONS 10 - 12

On an average, five smokers pass a certain street corner every 10 minutes. Assuming that the number of smokers follows Poisson distribution, then

- 10) The probability that, during a given 10-minute period, the number of smokers passing the street corner will be eight is:

| | | | |
|-----------|-----------|------------------|-----------|
| (A) 0.935 | (B) 0.025 | (C) <u>0.065</u> | (D) 0.075 |
|-----------|-----------|------------------|-----------|

- 11) The average number of smokers passing the street corner during a given 20-minute period will be:

| | | | |
|-------|---------|---------------|--------|
| (A) 5 | (B) 100 | (C) <u>10</u> | (D) 50 |
|-------|---------|---------------|--------|

- 12) The probability that no smoker passing the street corner during a given 5-minute period is:

| | | | |
|------------|-------------------|------------|------------|
| (A) 0.9179 | (B) <u>0.0821</u> | (C) 0.0067 | (D) 0.9933 |
|------------|-------------------|------------|------------|

QUESTIONS 13 - 15

Transverse diameter measurements on the hearts of males and females selected randomly from two independent normal populations with equal variances gave the following results:

| Group | Sample size | \bar{x} (cm) | S (cm) |
|---------|-------------|-------------------|-----------|
| Males | 12 | 13.21 | 1.05 |
| Females | 9 | 11.00 | 1.01 |

- 13) The point estimate of the difference between population means is

| | | | |
|----------|----------|-------|-----------------|
| (A) 13.2 | (B) 0.04 | (C) 3 | (D) <u>2.21</u> |
|----------|----------|-------|-----------------|

- 14) The standard error estimate of the difference between population means is

| | | | |
|------------|------------|-------------------|------------|
| (A) 0.3256 | (B) 0.8012 | (C) <u>0.4557</u> | (D) 0.6543 |
|------------|------------|-------------------|------------|

15) The 99% confidence interval for the difference between population means is

| | | | |
|------------------|-------------------------|------------------|------------------|
| (A) (0.52, 0.08) | (B) <u>(0.91, 3.51)</u> | (C) (1.56, 3.92) | (D) (3.03, 6.39) |
|------------------|-------------------------|------------------|------------------|

QUESTIONS 16 - 18

Assume that 25 % of the people in a certain large population have low blood pressure. A sample of 3 people is selected at random from this population. Let X be the number of people in the sample who have low blood pressure, then:

16) The values of mean and variance of the random variable X are:

| | | | |
|-------------|------------------|------------------|-------------------------|
| (A) 3, 0.75 | (B) 0.75, 0.1875 | (C) 0.25, 0.9752 | (D) <u>0.75, 0.5625</u> |
|-------------|------------------|------------------|-------------------------|

17) The probability that at least two persons will have low blood pressure, is:

| | | | |
|------------|----------|-------------------|-------------|
| (A) 0.8438 | (B) 0.25 | (C) <u>0.1563</u> | (D) 0.01563 |
|------------|----------|-------------------|-------------|

18) The probability that there will be at most two persons with low blood pressure, is:

| | | | |
|-------------|-------------------|----------|------------|
| (A) 0.01563 | (B) <u>0.9844</u> | (C) 0.75 | (D) 0.1406 |
|-------------|-------------------|----------|------------|

QUESTIONS 19 - 22

If the uric acid values in mg in healthy adult males are approximately normally distributed with a mean and standard deviation of 5.7 and 1 respectively, then

19) The mean of the distribution of the sample mean \bar{x} for the samples of size 10 is

| | | | |
|----------------|----------|-------|---------|
| (A) <u>5.7</u> | (B) 0.57 | (C) 1 | (D) 0.1 |
|----------------|----------|-------|---------|

20) The standard error of the distribution of the sample mean \bar{x} for the samples of size 10 is

| | | | |
|------------|---------|----------|-------------------|
| (A) 0.4165 | (B) 0.1 | (C) 3.16 | (D) <u>0.3162</u> |
|------------|---------|----------|-------------------|

21) The probability that a sample of size 9 will yield a mean greater than 6 is

| | | | |
|-------------------|------------|---------|------------|
| (A) <u>0.1841</u> | (B) 0.8159 | (C) 0.5 | (D) 0.1243 |
|-------------------|------------|---------|------------|

22) The probability that a sample of size 9 will yield a mean between 5 and 6 is

| | | | |
|------------|-------------------|------------|------------|
| (A) 0.8016 | (B) <u>0.7980</u> | (C) 0.8159 | (D) 0.4332 |
|------------|-------------------|------------|------------|

QUESTIONS 23 - 25

Suppose that Z is distributed according to the standard normal distribution, then:

23) The area under the curve to the right of $z = -0.89$ is:

| | | | |
|------------|-------------------|------------|------------|
| (A) 0.7815 | (B) <u>0.8133</u> | (C) 0.1867 | (D) 0.0154 |
|------------|-------------------|------------|------------|

24) The z value that has an area of 0.5 to its left, is:

| | | | |
|---------|-------|--------------|----------|
| (A) 0.5 | (B) 1 | (C) <u>0</u> | (D) -0.5 |
|---------|-------|--------------|----------|

25) The value of k such that $P(0.93 \leq Z \leq k) = 0.0427$

| | | | |
|------------|------------|-----------------|-------|
| (A) 0.9727 | (B) 0.8665 | (C) <u>1.11</u> | (D) 1 |
|------------|------------|-----------------|-------|