



King Saud University
College of Science
Department of Statistics
& Operations Research

STAT 145

Final Examination

Second Semester

1429 – 1430 H

Student Name:			
Student Number:		Section:	
Teacher Name:		Serial Number:	

- Mobile Telephones are not allowed in the classrooms
- Time allowed is 3 hours
- 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	D	B	C	A	B	D	C	A

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

21	22	23	24	25	26	27	28	29	30
A	A	A	D	D	C	B	A	C	B/C

31	32	33	34	35	36	37	38	39	40
B	B	A	A	C	B	D	A	C	B

→For Questions 1 , 2, and 3

Given the standard normal distribution find:

1) $P(Z > 1.32)$

- (A) 0.0838 (B) 0.1162 (C) 0.0066 (D) 0.0934

2) $P(1.32 \leq Z \leq 2.08)$

- (A) 0.1838 (B) 0.922 (C) 0.0746 (D) 0

3) $P(Z = 2.08)$

- (A) 0.1838 (B) 0.9812 (C) 0.0746 (D) 0
-

→For Questions 4 , 5 and 6

A random sample of 25 healthy women from a normal population has a mean blood pressure of 119, with a standard deviation of 30.

4) The sampling distribution of the sample mean is:

- A) Normal B) t C) Poisson D) not known

5) The estimated standard error of the mean $S_{\bar{x}}$ is:

- A) 8 B) 7 C) 6 D) 5

6) The 99 percent confidence interval for the mean of the population of healthy women is:

- A) (102.2,135.8) B) (105.5,150.3) C) (99.2,142.1) D) (101.7,137.5)
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→For Questions 7 and 8 consider a sample of 25 Saudi men aged 40-44.

Their hemoglobin levels are measured as :

“Below normal”, “Normal”, or “Above normal”.

7) In this study, the variable is

- (A) the Saudi men aged 40-44 (B) the hemoglobin levels
(C) the number of Saudi men (D) the age of a Saudi men

8) The type of the variable is

- (A) Discrete (B) Quantitative (C) Continuous (D) Qualitative

→For Questions 9 , 10 , 11 , and 12

A nurse researcher wished to know if graduates of baccalaureate nursing program and graduate of associate degree nursing program differ with respect to mean scores on personality inventory at $\alpha = 0.02$. A sample of 50 associate degree graduate (sample A) and a sample of 60 baccalaureate graduate (sample B) yields the following mean and standard deviation:

$\bar{X}_A = 52.5$, $S_A = 10.5$ and $\bar{X}_B = 49.6$, $S_B = 11.2$. Then

9) The hypothesis is

- (A) $H_0 : \mu_1 \leq \mu_2$ versus $H_1 : \mu_1 > \mu_2$ (B) $H_0 : \mu_1 \geq \mu_2$ versus $H_1 : \mu_1 < \mu_2$
(C) $H_0 : \mu_1 = \mu_2$ versus $H_1 : \mu_1 \neq \mu_2$ (D) O.W

10) The computed value of test statistic is:

- (A) 1.399 (B) 2.838 (C) 0.8974 (D) 177.2295

11) The critical region (rejection area) is:

- (A) $(-\infty, -2.602)$ or $(2.602, \infty)$ (B) $(-\infty, -2.06)$ or $(2.06, \infty)$
(C) $(-\infty, -2.33)$ or $(2.33, \infty)$ (D) $(-2.575, \infty)$

12) Your decision is:

- (A) reject H_0 (B) accept H_0 (C) reject H_1 (D) no decision
-

13) Suppose for a data, we have the sample mean equal to 9.0 and the sample variance of 20.25 then the coefficient of variation of the data is

- (A) 200 % (B) 225 % (C) 50 % (D) 44.444 %

14) Let A and B be two independent events defined on the same sample space such that $P(B^c) = 0.6$ and $P(A \cap B) = 0.2$. Then $P(A) =$

- (A) 0.7 (B) 0.4 (C) 0.5 (D) 0.3
-

→For Questions 15 , 16, and 17

Given a normally distributed population with a mean of 100 and a standard deviation of 20. Consider the sampling distribution of the sample mean based on samples of size 16, then

15) The mean of the sampling distribution of the sample mean is

- (A) 100 (B) 20 (C) 0.02 (D) 0.2

- 16) The variance of the sampling distribution for the sample mean is
(A) 16 (B) 20 (C) 1.45 (D) 25
- 17) The probability that the sample mean will be less than 110 is
(A) 0.0838 (B) 0.0228 (C) 0.9772 (D) 0.7410
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→For Questions 18 , 19 , 20 , and 21

The purpose of a certain study was to investigate factors associated with discrepancies between self-reported nonsmoking status and carboxyhemoglobin levels. A sample of 3600 self-reported nonsmokers had a mean carboxyhemoglobin level of 0.9 with a standard deviation of 0.96. We wish to know if we may conclude that the population mean(μ) is less than 1.0 at $\alpha=0.015$. Then

- 18) The hypothesis is
(A) $H_0 : \mu \leq 1.0$ versus $H_1 : \mu > 1.0$ (B) $H_0 : \mu \geq 1.0$ versus $H_1 : \mu < 1.0$
(C) $H_0 : \mu = 1.0$ versus $H_1 : \mu \neq 1.0$ (D) O.W
- 19) Computed value of test statistic is:
(A) -6.250 (B) -0.104 (C) 0.8974 (D) 177.2295
- 20) Critical region (rejection area) is:
(A) $(-\infty, -2.17)$ (B) $(-\infty, -2.43)$ (C) $(2.17, \infty)$ (D) $(2.43, \infty)$
- 21) Your decision is:
(A) reject H_0 (B) accept H_0 (C) reject H_1 (D) no decision
-

→For Questions 22 , and 23

In a survey of injection drug users in a large city , found 15 out of 450 were HIV positive. We wish to know if we can conclude that fewer than 6 percent of the injection drug users in the sampled population are HIV positive , let $\alpha = 0.01$ then

- 22) Computed value of test statistic is:
(A)- 2.38 (B) -0.7 (C) 0.8974 (D) 0.22
- 23) Your decision is:
(A) reject H_0 (B) accept H_0 (C) reject H_1 (D) no decision
-

24) Consider the sample observations: 0.3, 0.7, 0.5, 0.3 and 0.4, the sample median is:

- (A) 0.5 (B) 0.90 (C) 0.3 (D) 0.40

25) Data set A has a coefficient of variation of 120% while data set B has a coefficient of variation of 200%. Which of the following statements is true?

- (A) Both sets of data have the same variability.
 (B) Data set A is more variable than the data set B.
 (C) We cannot compare the variation of two data sets based on given information.
 (D) Data set B is more variable than the data set A.

26) The following table shows 80 patients classified by sex and blood group.

Sex	Blood Group		
	A	B	O
Male (M)	25	17	15
Female (F)	11	9	3

The probability that a patient selected randomly is a male and has blood group A is

- (A) 25/36 (B) 25/57 (C) 25/80 (D) 52/80
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→ For Questions 27, 28, 29, and 30

A random sample of 16 adults drawn from a certain population of adults yielded a mean weight of 63 kg. Assume that the weights in the populations are approximately normally distributed with variance of 64 kg². Do the sample data provide sufficient evidence for us to conclude that the mean weight for the population is more than 59 kg. use $\alpha=0.01$.

27) The test statistic is:

- (A) $t = \frac{\bar{x} - \mu_0}{s / \sqrt{n}}$ (B) $z = \frac{\bar{x} - \mu_0}{\sigma / \sqrt{n}}$ (C) $t = \frac{\bar{d}}{s_d / \sqrt{n}}$ (D) $t = \frac{\bar{x} - \mu}{s}$

28) The computed value of test statistic is:

- (A) 2.0 (B) 0.5 (C) 0.8 (D) 7.2

29) The critical region (rejection area) is:

- (A) (2.602, ∞) (B) ($-\infty$, -2.602) (C) (2.33, ∞) (D) ($-\infty$, -2.33)

- 30) Your decision is:
(A) reject H_0 (B) accept H_0 (C) reject H_1 (D) no decision
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- 31) Suppose it is known that in a certain area of a large city the average number of rats per block is five. Assuming that the number of rats follows a poisson distribution, find the probability that in a randomly selected block. There are less than two rats.
(A) 0.960 (B) 0.040 (C) 0.416 (D) 0.235
-

→ For Questions 32 and 33 the following table shows the weight loss (kg) of a sample of 20 healthy adults who fasted in Ramadan.

Class interval	Frequency	Cumulative Frequency
1 - 3	6	6
4- 6	2	8
7- 9	8	16
8-10	4	C

- 32) The value of the missing cumulative frequency C is
(A) 0 (B) 20 (C) 2 (D) 3
- 33) The percentage of adults losing weight less than or equal to 3.5 kg is
(A) 30% (B) 1% (C) 25% (D) 85%
-

→ For Questions 34 , and 35

If the total cholesterol values for a certain population are approximately normally distributed with a mean of 200 micrograms (mg) per 100ml and a standard deviation of 20 micrograms (mg) per 100ml, find the probability that an individual picked at random from this population will have a cholesterol value:

- 34) Between 180 and 200mg per 100ml
(A) 0.3413 (B) 0.1587 (C) 0.50 (D) 0.7920
- 35) Greater than 225mg per 100ml
(A) 0.8944 (B) 0.2141 (C) 0.1056 (D) 0.4190

36) In a study of childhood abuse, it was found that 166 in a sample of 947 patients reported abuse.

A 90 percent confidence interval for the population proportion is:

A) (0.275,0.315) B) (0.155,0.196) C) (0.273,0.638) D)(0.389,0.411)

37) Of a 215 black subjects, 58 had diabetes mellitus. Of a 1140 white subjects, 217 had diabetes mellitus. A 90 percent confidence interval for the difference between the two population proportions is:

A) (-1.028,-0.333) B) (0.0135,0.155) C) (-0.102,-0.225) D)(0.026,0.133)

38) A study focused on the effectiveness of seat belts in reducing injuries among survivors ages 4 to 14 who were admitted to hospitals. The study contrasted outcomes for 123 belted versus 290 unrestrained children among those involved in motor vehicle crashes who required hospitalization. The study report contained the following statistics on number of ICU days:

Group	Mean days	Estimated standard error
Belted	0.83	0.16
No restraint	1.39	0.18

The 95 percent confidence interval for $\mu_1 - \mu_2$ is:

A) (-1.032,-0.088) B) (-0.165,1.253) C) (0.731,1.382) D) (-0.266,1.743)

→For Questions 39 , and 40

Suppose it is known that the 25% of Saudi adults are overweight. If we select a simple random sample of eight Saudi adults, then

39) The probability that the number of overweight people in the sample will be zero is

(A) 0.001 (B) 0.0001 (C) 0.1 (D) 0.00001

40) The probability that the number of overweight people in the sample will be more than one is

(A) 0.1 (B) 0.633 (C) 0.367 (D) 0.266