

Model B

57. Can we say that the mean systolic blood pressure for a population of African-American is different from 160?			
A) No	B) Yes	C) We can not make a decision.	D) We need more informations to make a decision.
58. One of the following is a correct decision:			
A) Rejet H_A when H_0 is true.	B) Rejet H_0 when H_0 is true.	C) Rejet H_A when H_A is true.	D) Another answer.
59. Type-I error is defined as:			
A) Probability of rejeting H_0 when H_A is true.	B) Probability of rejeting H_0 when H_0 is true.	C) Probability of rejeting H_A when H_A is true.	D) Another answer.
60. Type-II error is defined as:			
A) Probability of rejeting H_0 when H_0 is true.	B) Probability of rejeting H_0 when H_A is true.	C) Probability of rejeting H_A when H_A is true.	D) Another answer.

Some useful values

$$Z_{0.9} = 1.285, Z_{0.95} = 1.645, Z_{0.975} = 1.96, Z_{0.99} = 2.325, Z_{0.995} = 2.575$$

$$Z_{0.9901} = 2.33$$

Values of f (alpha, power)

		.95	.90	.80	.50
Alpha Significance Level .01	.10	10.8	8.6	6.2	2.7
	.05	13.0	10.5	7.9	3.8
	.01	17.8	14.9	11.7	6.6

End of the exam

Good Luck



B
for true and fill the circle B for false.
circle in the answer sheet that

Don't forget to write your name, your inscription number and your serial number in the answer sheet.

Q1: True/False Questions: (20 points)

For the true or false questions, fill the circle A for true and fill the circle B for false in the answer sheet (from 1 to 20).

- | | | |
|----|---|-----|
| 1 | The blood type is a quantitative variable. | () |
| 2 | The sample mean can be negative. | () |
| 3 | The variance can not be computed for qualitative variables. | () |
| 4 | A questionnaire is a set of questions asked to the target respondent. | () |
| 5 | The sample mode is affected too much by extreme values. | () |
| 6 | The variance of the sample 5, 5, 5, 5 is 0. | () |
| 7 | For grouped data, the summation of the relative frequencies should be equal to 1. | () |
| 8 | The variance of the data is large when all values are close to the mean. | () |
| 9 | The sample mean is a statistic. | () |
| 10 | The sampling is not useful when the population of interest is too large. | () |
| 11 | The systematic random sampling is a probability sampling. | () |
| 12 | One of the disadvantages of stratified sampling that sampling problems may differ in each strata. | () |
| 13 | Sampling can save money. | () |
| 14 | In systematic random sampling, the size of selection interval is $\frac{N}{n}$. | () |
| 15 | Snowball sampling is a non- probability sampling. | () |
| 16 | The standard normal distribution is not symmetric. | () |
| 17 | In hypothesis testing: if the P - Value > the significant level (α), the null hypothesis should be accepted. | () |
| 18 | If $z_{0.975} = 1.96$, then $z_{0.025} = -1.96$. | () |
| 19 | The sample mean is a point estimation for the population variance. | () |
| 20 | In hypothesis testing: if we reject H_A , we can conclude that H_0 is false. | () |

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Model B

Using the sample 8, 6, 5, 4, 7, 9, 11, 15, 25 which is taken from a population with unknown mean (μ) and unknown variance (σ^2), answer questions 43 and 44.

43. The point estimation of μ is:
A) 3 B) 10
44. The point estimation of σ^2 is: C) 6 D) 7
A) 2.5 B) 5
45. It was desired to estimate the proportion of anaemic children in a certain preparatory school. A sample of size 1000 children is studied and it is found that 200 anaemic children. The point estimation of the proportion of anaemic children is:
A) 0.2 B) 0.3158 C) 0.3 D) 0.7
C) 4.6667 D) 42.75

In a study on cholesterol levels in Saudi Arabia, it was found that in a sample of 100 Saudi women aged 11-20, the mean cholesterol was 6 with a standard deviation of 2. Use this information to answer questions 46 - 49.

46. The point estimate of the population mean of cholesterol levels is:
A) 4.43 B) 8 C) 7 D) 6
47. The point estimate of the population variance of cholesterol levels is:
A) 1.1664 B) 1.08 C) 4.43 D) 4
48. A lower limit of a 90% confidence interval for the population mean of cholesterol levels is:
A) 7.51 B) 4.3222 C) 4.7312 D) 5.671
49. An upper limit of a 95% confidence interval for the population mean of cholesterol levels is:
A) 6.329 B) 7.33 C) 4.5377 D) 5.8798

50. Which of the following is suitable for displaying the categorical data?:
A) Bar charts B) Polygons C) Cumulative polygons D) Curves
51. In hypothesis testing: Let $H_0: \mu = \mu_0$ and $H_A: \mu \neq \mu_0$. Under significant level 0.01, H_0 should be rejected if the testing value (z) satisfies the following inequality:
A) $z > -2.575$ B) $z > 2.575$ or $z < -2.575$ C) $z = 2.575$ D) $z < 2.575$

52. In hypothesis testing: Let $H_0: \mu = \mu_0$ and $H_A: \mu > \mu_0$. Under significant level 0.01, H_0 should be rejected if the testing value (z) satisfies the following :
A) $z = 2.325$ B) $z < 2.325$ C) $z > 2.325$ D) $z < -2.325$
53. In hypothesis testing: Let $H_0: \mu = \mu_0$ and $H_A: \mu < \mu_0$. Under significant level 0.01, H_0 should be rejected if the testing value (z) satisfies the following inequality:
A) $z = 2.325$ B) $z < 2.325$ C) $z > -2.325$ D) $z < -2.325$

Read carefully the following problem and answer questions (54-57):
Among 100 African-American men, the mean systolic blood pressure was 146 mm Hg with a standard deviation of 60. We wish to know if on the basis of these data, we may conclude that the mean systolic blood pressure for a population of African-American is different from 160. Use $\alpha=0.1$.

54. The hypothesis H_0 and H_A are:
A) $H_0: \mu = 140$ and $H_A: \mu > 140$ B) $H_0: \mu = 157$ and $H_A: \mu < 157$ C) $H_0: \mu = 140$ and $H_A: \mu \neq 140$ D) $H_0: \mu = 160$ and $H_A: \mu \neq 160$
55. Test statistic(z) is:
A) 2.78 B) -2.33 C) 20.5 D) 1.5
56. The decision by using P - value = 0.0198 is:
A) Reject H_0 B) Reject H_A C) We can not make a decision D) We need more informations to make a decision.

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Multiple-Choice Questions: Choose the correct answer. (40 points)
 The following sample data (1, 2, 1, 4, 2, 4, 5, 8, 5, x) to answer questions 20- 25

21. If the sample mode is 5. The value of x will be:
 A) 5 B) 4 C) 1 D) 3
22. The sample mean is:
 A) 3.7 B) 3.1 C) 4 D) 3
23. The sample median is:
 A) 2 B) 7 C) 4 D) 3
24. The sample range is:
 A) 5 B) 7 C) 3 D) 4
25. The sample variance is:
 A) 2.5 B) 5.63 C) 4.9 D) 1.69

The following table shows the ages of n patients seen in the emergency room of a hospital during a week:

Degree	Frequency(f_i)	Centers of the intervals(m_i)	$m_i f_i$	$m_i^2 f_i$	Relative Frequency
8-16	6	12	72	864	0.12
18-26	5	22	110	2420	0.10
28-36	11	32	352	11264	y
38-46	x	42	168	7056	0.08
48-56	13	52	676	35152	0.26
58-66	4	62	248	15376	0.08
68-76	7	72	504	36288	z
Total	n	303	2130	108420	1

Use this table to answer questions 26 - 32

26. The sample size is:
 A) 150 B) 75 C) 50 D) 100
27. The value of x is:
 A) 6 B) 5 C) 10 D) 4
28. The value of y is:
 A) 0.7 B) 0.43 C) 0.33 D) 0.22
29. The value of z is:
 A) 1 B) 0.3 C) 0.14 D) 0.63
30. The sample mean is:
 A) 72.4 B) 39.6 C) 33.2 D) 42.6
31. The sample variance is:
 A) 360.8571 B) 18.69 C) 43.8 D) 55.8
32. The coefficient of variation (C.V.) is:
 A) 44.592% B) 77% C) 60% D) 34%

0,64
0,36

Choose the correct answer. (from 33 - 60):

33. In systematic random sampling, if the sample size is 20 and the population size is 100, the size of the selection interval is:
 A) 5 B) 8 C) 10 D) 20
34. The area under the curve of the normal distribution is:
 A) 0.5 B) 1 C) 2 D) 2.5
35. One of the following is a non-probability sampling:
 A) Snowball sampling B) Judgment sampling C) Quota sampling D) A, B and C
36. One of the following is a probability sampling:
 A) Snowball sampling B) Quota sampling C) Stratified sampling D) Judgment sampling
37. If we can divide the population into at least two different groups with a common characteristic, the sample form we should use:
 A) Quota sampling B) Stratified sampling C) Simple random sampling D) Systematic sampling
38. If we want to take a non-probability sample from a population of rare elements, we should use:
 A) Systematic sampling B) Quota sampling C) Simple random sampling D) Snowball sampling
39. A study is to be performed to determine a certain parameter in a community. From a previous study a standard deviation of 46 was obtained. If a sample error of up to 4 is to be accepted, the number of subjects should be included in this study at 5% level of significance is:
 A) 877 B) 358 C) 509 D) 400
40. A study is to be done to determine the effect of 2 drugs (A and B) on blood glucose level (BGL). From previous studies using those drugs, standard deviations of BGL of 8 and 12 g/dl were obtained respectively. A significant level of 1% and a power of 80% is required to detect a mean difference between the two groups of 3 g/dl. The number of subjects should be included in each group is:
 A) 199 B) 243 C) 300 D) 271
41. It was desired to estimate the proportion of anaemic children in a certain preparatory school. In a similar study at another school a proportion of 30% was detected. The minimal sample size required at a significant level of 1% and accepting a difference of up to 4% of the true population is:
 A) 871 B) 450 C) 505 D) 356
42. In previous studies, the percentage of hypertensives among diabetics was 70% and among non-diabetics was 40% in a certain community. A researcher wants to perform a comparative study for hypertension among diabetics and non-diabetics at a significant level of 1% and a power of 90%. The minimal sample to be taken from each group with 4% accepted difference of true value is:
 A) 4610 B) 4200 C) 3342 D) 2445