# Biostatistics

## Archive

## FAINAL EXAM

Done by:
Ibrahim Sabri Al-Awaje
Obada Khalid Al-Khawaldeh

Designed By :
Raneem Dmour

لجنة الطب والجراحة

# $\mathcal{B}$iostatistics

1, One of the following statements is important to know the type of data in our hands?
A- Each type has certain formala for calculating the median.
B- Each type has certain its own p-value of significance.
C- Each type has  its own test of significance.
D- Each type has certain graphic presentation.

**Answer: C- Each type has  its own test of significance.**

2. In a study of hypertension men, the population of subjects with high and low renin levels who survived for 5 years are compared seperately among Anose aged 40-49, 50-59, 60-69. This sampling method is?
A- snowball
B- stratified
C- Quota
D - simple random sampling
E- systematic sampling

**Answer: B- stratified**

3. The suitable study design for unexpected New therapatic effect is?
A- case control
B- case report
C- clinical trial
 D- cohort study
e- case series.

**Answer: B- case report**

4. (N-1) is known as ?
A - Test of significance
B - CV
c- sum of square
d- Range
E- degree of freedom

**Answer: E- degree of freedom**

5. The importance of using a random sample,
including All the following except?
A- to give everyone in the population the same probability.
B- to eliminate selection bias of selection
c- To make Data representation to the population.
D- To minmize sample size
e-to have suitable sample for significance result.

Answer: D- To minmize sample size

6. One of the following is not a probability sampling:
 A- Systematic sampling
 B- Cluster sampling
 C- Stratified random sampling
 D- Simple random sampling
 E- Convenient sampling

Answer: E. Convenient sampling

7. One of the following is a necessary condition for a sample to be random:
 A- Every person in the population has the same likelihood of being included in the sample.
 B- The characteristics of the sample are the same as the characteristics of the population.
 C- The choice of the method of selecting individuals from the population is governed entirely by chance.
 D- Choosing the persons who are close to us.
 E- Proportions of various groups selected are equal to corresponding proportions in the population.

Answer: a. Every person in the population has the same likelihood of being included in the sample

8. One of the following is correct decision regarding hypothesis:
A- accept null hypothesis while it is true
B. Reject the null hypothesis when it is true.
C. Accept the alternative hypothesis when the p-value is greater than 0.05.
D. Reject the alternative hypothesis when the p-value is less than 0.05.
E. Always accept the null hypothesis when the sample size is large.

Answer: A- accept null hypothesis while it is true

9. One of the following is not correct about paired t-test:
A. Independence of the samples.
B. Assumes normality of the differences between paired observations.
C. Used for comparing means of two related groups.
D. Requires equal variances in the two groups being compared.
E. Assumes that the observations are paired or matched.

Answer: A. Independence of the samples.

**10. The followings Charactristics case control Except:**

A. More than one risk factor could be studied in the same study.

B. More than one disease could be investigated in the same study.

C. The study design is typically retrospective.

D. Participants are randomly assigned to case or control groups.

E. Cases and controls are matched based on specific criteria.

Answer: D. Participants are randomly assigned to case or control groups.

**11. The best study incidence type 2 diabetes among obese:**

A. Cohort study

B. Case-control study

C. Cross-sectional study

D. Case report

Answer: A. Cohort study

**12. Main disadvantage of case control:**

A. Recall bias

B. High cost and long duration

C. Difficulty in establishing temporal relationships

D. Requires large sample sizes

E. Random assignment of participa

Answer: A. Recall bias

**13. Regarding Continuous variable, which of the following is not true:**

A. Using chi-square for testing hypotheses.

B. Can be measured on a scale with meaningful distances between values.

C. Allows for calculations of means and standard deviations.

D. Can be analyzed using parametric tests like t-tests and ANOVA.

E. Typically includes variables like height, weight, and temperature.

Answer: A. Using chi-square for testing hypotheses.

**14. We have decided to conduct a study on smoking among students of Mutah University. If we selected the first five students entering each faculty. The type of this sampling will be:**

A- Simple random sampling

B- Systematic random sampling

C- Stratified random sampling

D- Cluster random sampling

E- Multi- stage random sampling

Answer: C. Stratified random sampling.

(University was divided into faculties (strata) and we chose them all. Then by a way of random sampling we carried on)

**15.** We have decided to conduct a study on smoking among students of Mutah University. By using the random digit, we collected samples from 100 students from the main library. The type of this sampling will be:

A- Simple random sampling
B- Systematic random sampling
C- Stratified random sampling
D- Cluster random sampling
E- Multi- stage random sampling

Answer: D. Cluster random sampling.

(Random digit is used for simply random sampling. However, it can be used with other methods. For simple random sampling to be the one used ALONE, all the population should be given numbers and this sounds to be impracticable for a university. Moreover, "from the main library" suggest a cluster (i.e. university building, then we picked this sub-element).)

**16.** In an urban area, 3 households were randomly selected then every person in each household was studied. This type of sampling is:

A- Simple random sampling
B- Systematic random sampling
C- Stratified random sampling
D- Cluster random sampling
E- Multi- stage random sampling

Answer: D. Cluster random sampling

**17.** In two tailed t- test at alpha = 0.01 and total subjects = 25. The critical t value is:

A. 2.787
B. 2.492
C. 2.576
D. 2.819
E. 2.658

Answer: D. 2.819

**18.** The z-score corresponding to the 89th percentile is?

A- 2.44
B- 1.05
C- 0.88
D- 1.23
E- 0.48

Answer: D- 1.23

# $\mathscr{B}$iostatistics

**19. To cover 99% of population under the NDC we have to?**
A. Use a z-score of ±1.96
B. Use a z-score of ±2.33
C. Use a z-score of ±3.00
D. Use a z-score of ±1.28
E. Use a z-score of ±2.58

Answer:E. Use a z-score of ±2.58

**20. All of the following is correct about cohort study except:**
A. Subjects may experience bias from loss to follow-up.
B. Subjects are prone to recall bias.
C. Results could be affected by changes in diagnostic methods over time.
D. Can examine multiple outcomes from a single exposure.
E. Provides information on the incidence of outcomes.

Answer: B. Subjects are prone to recall bias.

**21. The best study design for prevalence disease at the population level:**
A. Cross-sectional study
B. Case-control study
C. Cohort study
D. Longitudinal study

Answer: A. Cross-sectional study

**22. The distance between one standard deviation in both side :**
A- 68%
B- 99%
C- 95%
D- 34%

Answer: A- 68%

**23. The distance between the first and third quartile:**
A- 20%
B- 30%
C- 40%
D- 50%

Answer: D- 50%

**24. There is 13 babies if 6 babies are above 2.5 kg and 6 bellow 2.5 kg, so 2.5 is :**
A- Median
B- Mode
C- S.D
D- S.E

ANSWER: A- Median

**25. The measurement that affect by extremes and skewness is:**
A- Mode
B- Median
C- Mean
D- Mean and mode
E- Mean and median

Answer: C- Mean

**26. The degree of freedom for 8*5 contegincy table :**
A- 20
B- 40
C- 28
D- 24

Answer: C- 28

**27. The area under the curve between z= -1.16 and Mean:**
A. 0.3770
B. 0.4500
C. 0.3849
D. 0.4000
E. 0.3620

Answer: A. 0.3770

**28. The area under the curve between z= -0.97and Mean:**
A. 0.3340
B. 0.3420
C. 0.3456
D. 0.3451
E. 0.3500

Answer: A. 0.3340

**29. What is the type 2 error :**
A. Accept the null hypothesis while it is false.
B. Reject the null hypothesis while it is true.
C. Accept the alternative hypothesis while it is false.
D. Reject the alternative hypothesis while it is false.
E. Fail to detect an effect that is actually present.

Answer: A. Accept the null hypothesis while it is false.

**30. When alpha is 0.01 ...it is considered statically not significant when :**
A. p {value} = 0.005
B. p {value} = 0.009
C. p {value} = 0.007
D. p {value} = 0.013

Answer: D. p {value} = 0.013

**31. What is the false about gussian curve :**
A. The mean equals 1 and the standard deviation equals zero.
B. We use the mean and standard deviation to describe it.
C. It is symmetrical around the mean.
D. The area under the curve totals 1.
E. It can be transformed into the standard normal distribution with a mean of 0 and a standard deviation of 1.

Answer: A. The mean equals 1 and the standard deviation equals zero.

**32. One of the following is not disadvantage for primary data:**
A. Low effort
B. High cost
C. Time consuming
D. Requires detailed planning
E. Potential for higher accuracy

Answer: A. Low effort

**33. Which one incorrect about independent t_test?**
A. Categorical data
B. Compares means between two independent groups
C. Assumes normality of the data in each group
D. Assumes equal variances between the groups
E. Requires continuous data

Answer: A. Categorical data

**34. True about chi square except?**
A. Always it is one-sided (upper tail).
B. It is used for categorical data.
C. It compares observed frequencies to expected frequencies.
D. It assumes independence of observations.
E. It requires data to be normally distributed.

Answer: E. It requires data to be normally distributed.

**35. If the calculated t-value is (15) and the critical t-value is (1,38), one of the following is true:**
A. There is a significant association between maternal smoking and newborns' weight.
B. The null hypothesis should be accepted.
C. The result is not statistically significant.
D. The p-value is greater than 0.05.
E. The sample size is too small to detect an effect.

Answer: A. There is a significant association between maternal smoking and newborns' weight.

**36. If 400 students take an exam, what is the percentile of the 300 students:**
A- 25%
B- 50%
C- 75%
D- 100%

Answer: C- 75%

**37.All true about p value except?**
A. Probability of observing the data given that the null hypothesis is true.
B. A measure of the strength of evidence against the null hypothesis.
C. Can be used to determine statistical significance by comparing it to a significance level ($\alpha$).
D. Provides the probability of a Type I error occurring.
E. Does not measure the probability of the null hypothesis being true.

Answer: D. Provides the probability of a Type I error occurring.

**38. If the birth weight of each of the 12 babies in a hospital in the day is found to be 2,25kg, then the SD of this sample:**
a) 0 kg
b) 1.25 kg
c) 2.25 kg
d) 3 kg

Answer: a) 0 kg

**39.** according to the prescribed antibiotic therapy as well as the treatment outcome

| Treatment | Prescribed Antibiotic | | | Total |
|---|---|---|---|---|
| Outcome | TMP- SMX | Amoxicillin | Cyclacillin | |
| Cured | 110 | 60 | 130 | 300 |
| Improved | 105 | 150 | 210 | 465 |
| Not cured | 35 | 90 | 110 | 235 |
| Total | 250 | 300 | 450 | 1000 |

The degree of freedom of the test statistics is:
a. 997
b. 1
c. 4
d. $\alpha$
e. 6

Answer: c. 4

40. The following table presents the distribution of 1000 women suffering from cystitis according to the prescribed antibiotic therapy as well as the treatment outcome

| Treatment Outcome | Prescribed Antibiotic | | | Total |
|---|---|---|---|---|
| | TMP- SMX | Amoxicillin | Cyclacillin | |
| Cured | 110 | 60 | 130 | 300 |
| Improved | 105 | 150 | 210 | 465 |
| Not cured | 35 | 90 | 110 | 235 |
| Total | 250 | 300 | 450 | 1000 |

The expected value for those who have been cured by amoxicillin is:
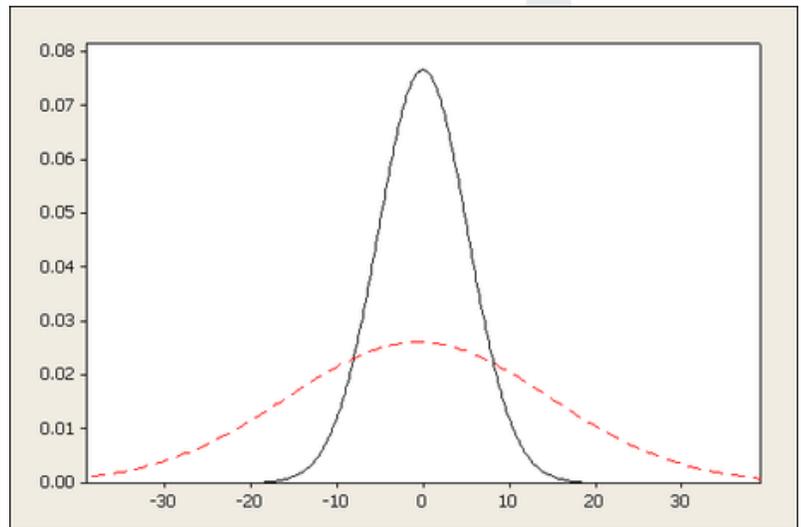
a. 18
b. 60
c. 90
d. 70.5
e. 139.5

Answer: c. 90

41. In following picture, the difference between two curves is:
A)mean
B)mode
C)mean
D)sd
Answer: D)sd

**42.One of the following is not a source of secondary data:**
A.Vital events registration
B.Hospital records
C.Online questionnaire
D.Disease registration
E.Environmental health

Answer:"C.Online questionnaire."

**43.One of the following is not a method used to collect primary data:**
A.Interviews.
B.Questionnaires.
C.Surveys.
D.Experimentations.
E.Census.

Answer:"E.Census."

**44..In a group of 100 women the mean weigh is 17 Kgs and the standard deviation is 1.5 Kgs. One of the following is correct:**
A.95% of all women weigh between 14 and 20 Kgs.
B.95% of all women weigh between 15.5 and 18.5 Kgs. C.99% of all women weigh between 14 and 20 Kgs.
D.99% of all women weigh between 15.5 and 18.5 Kgs. E.68% of all women weigh between 12.5 and 21.5 Kgs.

Answer:"A. 95% of all women weigh between 14 and 20 Kgs."

**45.When using alpha level of 0.05, the test is considered to be statistically significant if**
A.P=0.052
B.P=0.04
C.P=0.1
D.P=0.2
e.C&D

Answer:"B.P=0.04"

**46.** In two tailed t- test at alpha=0.1 and total subjects= 29, The critical t value is:

A. 2.05
B. 2.76
C. 1.70
D. 3.67

Answer:"C. 1.70"

**47.** In Gaussian distribution, one of the following characteristics is incorrect:

A. It is a bell- shaped, continuous curve
B. The tail never touches the base
C. The mean, mode and median values are equal to one
D. It is described by two parameters; the mean and the standard deviation
E. About 95% of the probability under the curve fall within two standard deviations around the mean.

Answer:"C.The mean, mode and median values are equal to one."

**48.** When we accept the null hypothesis at a level of significance equals 0.01, this means:

A. $P>0.003$ .
B. $P>0.05$ .
C. $P>0.001$ .
D. $P>0.01$.
E. B&D.

Answer:"E.B&D."

**49.** Suppose we are interested in the average cholesterol level measurements of the population at Al- Karak Governorate: the set of cholesterol measurements of people at Mutah district comprise:

A. Parameters.
B. Statistics.
C. A sample.
D. An element.
E. A population.

Answer:"C.A sample."

50.In two tailed t- test at alpha=0.001 and total subjects= 25, The critical t value is:

A. 3.75
B. 2.80
C. 3.29
D. 2.06

Answer:"A. 3.75"

51.We want to know who is clever between Muta'a University Students or Jordanian University Students and we know the following information for Muta'a Students: sample size =50, mean IQ=75 , standard deviation=6;for Jordanian University Students:sample size=85 ,mean IQ=73 , standard deviation=8 (Assuming that level of significance or alpha=0.05, and two-sided test). The calculated value will be:

A.1.70517
B.2
C.1.53159
D.1.17290

Answer:"C.1.53159"

52.Concerning Chi'square test all the following statements are false except?

A.Chi square is used with continuous data.
B.Can be applied when we have proportion rate alone.
C.Applied in qualitative data.
D.It is used when we have One group of population.

Answer:"C.Applied in qualitative data."

53.Concerning Chi'square test all the following statements are false except?

A.The degree of freedom is (c+1)x (r-1).
B.Applied in quantitative data.
C.It is used when we have one group of population.
D.It is used when we have two groups of population or more.

Answer:"D.It is used when we have two groups of population or more."

**54.In Chi square test, the Alternative hypothesis could be accepted if:**
A.The difference between the observed and the expected values for each cell is small
B.The expected value for each column is equal to the expected value of the corresponding row
C.The expected values in all cells are equal
D.The difference between the observed and the expected values for each cell is large
E.The observed value for each cell is equal to zero

Answer:"DThe difference between the observed and the expected values for each cell is large"

**55.If N=50 and the critical t value=2 when the alpha=0.05 and the calculated t value=2.5 ,the p−value is:**
A.P>0.05
B.P>0.1
C.0.1>P>0.05
D.0.05>P>0.01
E.Can't be calculated

Answer:"D.0.05>P>0.01"

**56. 500 "10th" grade students in a school district took a standardized social studies test that is normally distributed and has a Mean=350 & a Variance=225**
Here are the scores for three students: Azeez scored 380, Murad scored 320 and Kareem Scored 360.
What the probability of students would be expected to score below Murad?
A.2.270%
B.0.100%
C.97.73%
D.0.500%
E.0.853%

Answer:"A.2.270%"

# Biostatistics

57.Given a distribution mean is 32 and SD=4 and the standard score=2, the score that will be associated with the standard score:
A.32.
B.40.
C.-40.
D.8.
E.256.

Answer:"B.40"

58.The mean IQ for 64 Muta'a University Students =120 with a variance=16, and the mean IQ of Universities students in Jordan=110 ; the calculated t value:
A.5.
B.-5.
C.20.
D.-20
E.40

Answer:"C.20"

59.0dds ratio for Heart attacks and sports is 1.0, this Indicates:
A.Exposure reduce Diseases risk.
B.Protective factors.
C.Risk factor.
D.Exposure are equal among cases and control.

Answer:"D.Exposure are equal among cases and control"

60.Chi square is valid provided that,Except:
A.If the overall total is less than 40,all the expected values should be at least 5.
B.There should be no cell zero.
C.More than 20% of the expected numbers should be less than 1.
D.The total number should be more than 40.

Answer:"C.More than 20% of the expected numbers should be less than 1."