



**AMREF INTERNATIONAL UNIVERSITY  
SCHOOL OF MEDICAL SCIENCES  
DEPARTMENT OF NURSING & MIDWIFERY SCIENCES  
End of Semester April 2025 Examinations**

**COURSE CODE AND TITLE: BSN 315- Biostatistics**

**DATE: 17-APRIL-2025**

Duration: 2 HOURS

Start: 9:00 AM

Finish: 11:00 AM

**INSTRUCTIONS**

1. This exam is out of 70 marks
2. This Examination comprises THREE Sections. Section I: Multiple Choice Questions (20 marks) Section II: Short Answer Questions (30 marks) and Section III: Long Answer Questions (20 marks)
3. Answer ALL Questions.
4. Do Not write anything on the question paper -use the back of your booklet for rough work if need be.

## **SECTION I: MULTIPLE-CHOICE QUESTIONS (20 MARKS)**

1. The measure of central tendency most affected by outliers is;-
  - A. Mean
  - B. Median
  - C. Mode
  - D. Range
2. A correlation coefficient of -0.92 suggests:
  - A. No relationship
  - B. Strong positive relationship
  - C. Weak negative relationship
  - D. Strong negative relationship
3. The test that compares proportions in categorical data is;-
  - A. t-test
  - B. Chi-square
  - C. ANOVA
  - D. MANOVA
4. The standard deviation measure is;-
  - A. Central tendency
  - B. Spread around the mean
  - C. Difference between max/min
  - D. Skewness
5. An odds ratio of 3.0 indicates:
  - A. No association
  - B. Reduced risk
  - C. Tripled odds of outcome
  - D. Weak effect
6. The qualitative method that focuses on interpreting stories is;-
  - A. Content analysis
  - B. Narrative analysis
  - C. Grounded theory
  - D. Discourse analysis
7. SPSS is primarily used for:
  - A. Qualitative analysis
  - B. Quantitative analysis
  - C. Manual calculations
  - D. Narrative analysis
8. ANOVA is used to analyze:
  - A. One dependent variable
  - B. Multiple dependent variables
  - C. Medians
  - D. Odds ratios
9. The purpose of regression analysis is to:
  - A. Test normality
  - B. Model variable relationships
  - C. Calculate frequencies
  - D. Determine mode
10. The test that compares means across three groups is;-
  - A. t-test

- B. Chi-square
  - C. ANOVA
  - D. Odds ratio
11. The range of the dataset: 10, 15, 20, 25, 30 is;-
- A. 10
  - B. 15
  - C. 20
  - D. 25
12. The following is a measure of dispersion;-
- A. Mean
  - B. Median
  - C. Standard deviation
  - D. Mode
13. A p-value of 0.03 in hypothesis testing suggests:
- A. Accept the null hypothesis
  - B. Reject the null hypothesis at  $\alpha = 0.05$
  - C. The result is not statistically significant
  - D. The effect size is large
14. The following is a nonprobability sampling method;-
- A. Simple random sampling
  - B. Stratified sampling
  - C. Convenience sampling
  - D. Cluster sampling
15. A 95% confidence interval indicate;-
- A. The range of values within which the population parameter lies
  - B. The range of values within which the sample mean lies
  - C. The probability of Type I error
  - D. The probability of Type II error
16. The following is a qualitative data analysis method;-
- A. ANOVA
  - B. Content analysis
  - C. Regression analysis
  - D. t-test
17. The median of the dataset: 12, 15, 18, 22, 24, 27 is;-
- A. 18
  - B. 20
  - C. 22
  - D. 24
18. The following is true about the normal distribution;-
- A. It is skewed to the left
  - B. It is skewed to the right
  - C. It is symmetric around the mean
  - D. It has no mean
19. The primary purpose of a scatterplot is;-
- A. To show frequencies
  - B. To show relationships between two variables
  - C. To compare proportions
  - D. To display central tendency
20. The following is a measure of central tendency;-
- A. Variance
  - B. Standard deviation

- C. Mean
- D. Range

**SECTION II: SHORT-ANSWER QUESTIONS (30 MARKS)**

1. Giving examples, distinguish between descriptive and inferential statistics. (6marks)
2.
  - a) Differentiate between content analysis and grounded theory in qualitative research. (2marks)
  - b) When would a researcher prefer using computer-assisted qualitative data analysis over manual analysis. (2marks)
  - c) Provide an example of a research question suited for narrative analysis. (2marks)
3.
  - a) Explain significance of odds ratio in epidemiological studies. (2marks)
  - b) How does a chi-square test differ from a t-test in application? (2marks)
  - c) Interpret an odds ratio of 2.5 with a 95% confidence interval of (1.3, 4.8). (2marks)
4.
  - a) List three assumptions for conducting a paired t-test. (2marks)
  - b) Why is ANOVA preferred over multiple t-tests for comparing more than two groups? (2marks)
  - c) What does a p-value of 0.02 mean in hypothesis testing? (2marks)
5.
  - a) Compare the use of bar graphs and scatterplots for presenting quantitative data. (2marks)
  - b) When would you use SPSS instead of manual calculations for data analysis? (2marks)
  - c) Why is it important to include measures of dispersion (e.g., standard deviation) alongside means in a report? (2marks)

**SECTION III: LONG ANSWER QUESTION (20 MARKS)**

1. A study examines the impact of a diet program on weight loss (kg) in 10 participants:  
Pre-program: 80, 85, 90, 75, 95, 70, 88, 82, 78, 92  
Post-program: 75, 80, 85, 72, 88, 68, 82, 78, 74, 86
  - a) Calculate the mean, median, and standard deviation for pre- and post-program data. (6 marks)
  - b) Perform a paired t-test to determine if weight loss is significant (show steps). (6 marks)
  - c) Interpret the t-test result ( $\alpha = 0.05$ ). (4 marks)
  - d) Recommend how to present findings (include one graph and software choice). (4 marks)