



KENYATTA UNIVERSITY
EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE (NURSING)
HNS 325: EPIDEMIOLOGY AND BIOSTATICS

3RD TRIMESTER 2021/2022

TIME: 2 HOURS

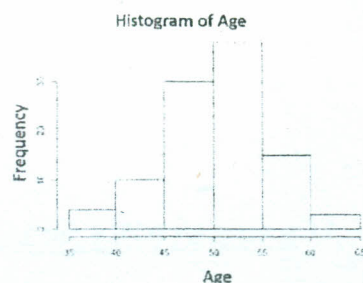
SECTION A: ANSWER ALL QUESTIONS (20 MARKS)

1. A relative risk of 1 denotes: -
 - a. A strong association between exposure and disease
 - b. A negative association between exposure and disease
 - c. No association between exposure and disease
 - d. Positive association between exposure and disease
2. Agent related factors in the epidemiological triad include: -
 - a. Vector, environment, host
 - b. Mode of transmission, portal of exit and portal of entry
 - c. Chemical, physical and biological factors
 - d. Virulence, pathogenicity, dose
3. Treating infected persons to avoid spread of communicable disease is one of the strategies of: -
 - a. Protecting the host
 - b. Attacking the source
 - c. Interrupting mode of transmission
 - d. Reducing susceptibility
4. Indicate whether the following statements are **True** or **False** on the answer booklet provided.
 - a. Numerators and denominators of a ratio can be related or unrelated
 - b. The numerator and the denominator should be of the same nature in calculation of proportions
5. The prevention of emergence or development of risk factors in a population is referred to as: -
 - a. Primary prevention
 - b. Primordial prevention
 - c. Secondary prevention
 - d. Tertiary prevention
6. High prevalence of a disease is associated with: -
 - a. Low incidence
 - b. Short duration
 - c. Improved survival

- d. Fast cure
- 7. One of the following is correct regarding incidence: -
 - a. It is useful in determining disease burden
 - b. It is a measure of risk of developing the disease
 - c. It can be determined through cross-sectional studies
 - d. It can be determined through case-control studies
- 8. Proportionate mortality describes: -
 - a. The proportion of deaths in a specified population attributable to a particular cause
 - b. The mortality rate from a specified cause in a population
 - c. The proportion of deaths limited to a particular age group.
 - d. Standardized mortality rates
- 9. One of the following is correct regarding vital statistics: -
 - a. Vital statistics are the most comprehensive source of demographic data
 - b. Conducting national surveys is the most common method of obtaining data for vital statistics
 - c. Marriages and divorces are examples of vital statistics
 - d. The recording of vital statistics is done in a periodical and temporally manner because it is not compulsory in most countries.
- 10. The major determinants of demography are: -
 - a. Size, structure and distribution of populations
 - b. Migration, mortality and morbidity
 - c. Migration, mortality and fertility
 - d. Crude birth rate, crude death rate and life expectancy
- 11. The main difference between ratio and interval measurement scales is that, a ratio scale: -
 - a. Is used for discrete data
 - b. Has a meaningful point zero
 - c. Has constant and equal distances between values
 - d. Has unknown distance between values
- 12. The following is correct about the mode: -
 - a. There can only be one mode in an array of data
 - b. It should not be used to describe continuous data
 - c. It is affected by skewness of data
 - d. It is influenced by outliers
- 13. Population variance is denoted by: -
 - a. σ_i

- b. σ^2
- c. σ
- d. σ_x

14. The statistics that should be used to describe the following distribution are -



- a. Median and interquartile range
 - b. Mean and standard deviation
 - c. Median and standard deviation
 - d. Mean and interquartile range
15. The p value is the probability: -
- a. That the null hypothesis is true.
 - b. That the alternative hypothesis is true.
 - c. Of obtaining the observed or more extreme results if the alternative hypothesis is true.
 - d. Of obtaining the observed or more extreme results if the null hypothesis is true.
16. Rejecting a null hypothesis that is true results in: -
- a. Type-I error
 - b. Type-II error
 - c. Standard error
 - d. Sampling error
17. In analysing the results of an experiment involving seven paired samples, tabulated t should be obtained for:
- a. 13 degrees of freedom
 - b. 6 degrees of freedom
 - c. 7 degrees of freedom
 - d. 14 degrees of freedom
18. A 95% confidence interval estimate for the difference between two population means, is determined to be (62.75, 68.52.). If the confidence level is reduced to 90%, the confidence interval:
- a. Becomes wider
 - b. Remains the same
 - c. Becomes narrower

- d. Becomes significant
19. In regression analysis, the variable that is being predicted is: -
- The independent variable
 - The dependent variable
 - Usually denoted by x
 - Usually denoted by r
20. The Mann-Whitney U test is preferred to a t-test when
- Data are paired
 - Sample sizes are small
 - Data is not normally distributed
 - Samples are dependent

SECTION B: SHORT ANSWER QUESTIONS. ANSWER ALL QUESTIONS (40 MARKS)

- Describe the 'Iceberg Phenomenon in disease' control and management of diseases. (5 marks)
- Describe the concept of 'distribution of health related events' as used in epidemiology. (4marks)
- A study examining the association between oestrogen therapy and breast cancer had results as follows:

	Had Breast Cancer	No Breast Cancer
Exposed to Oestrogen	40	200
No Exposure to Oestrogen	20	400

Calculate the odds ratio and interpret the results (5 marks)

- Explain three (3) types of epidemics (6 marks)
- Indicate whether each of the following variables are Nominal, ordinal, discrete or continuous (5 marks)
 - Route of drug administration
 - Cost of paracetamol tablets
 - Degree of burns
 - Level of health facility
 - Blood type
 - Body temperature in °C
 - Diastolic blood pressure in mmHG
 - Number of discharged patients
 - HIV status
 - The number of live births an expectant mother has had.
- Suppose in a given area, the probability that a person with a high fever will be positive for malaria is 0.70. Considering 3 randomly selected patients with replacement (with high fever) in that same area:-

- a) Calculate the probability that no patient will be positive for Malaria (1 mark)
 - b) Calculate the probability that exactly one patient will be positive for Malaria (2 marks)
 - c) Calculate the probability that exactly two of the patients will be positive for Malaria (2 marks)
7. Explain the three (3) types of chi-square tests. (6 marks)
 8. State four (4) assumptions of the independent-samples t-test (4 marks)

SECTION C: LONG ANSWER QUESTIONS (40 MARKS)

1. Describe four (4) observational-analytical epidemiological study designs (20marks)
2. The following table shows the time spent by a sample of women on aerobic exercises per week.

Time in hours	No. of Women
1-10	8
11-20	14
21-30	12
31-40	9
41- 50	7

- a) Calculate the mean and interpret the answer (10 marks)
- b) Calculate the median and interpret the answer (10 marks)